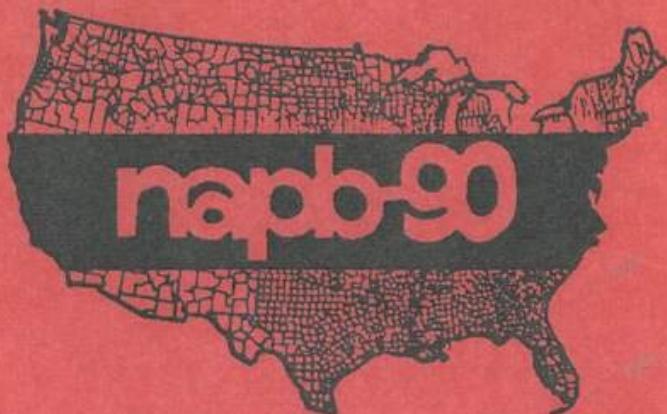


Nuclear Attack Planning Base-1990 Final Project Report

Part 1 Project Overview
Part 2 Project Development
Part 3 Risk Definitions



<https://fas.org/nuke/guide/usa/napb-90/>
<https://fas.org/nuke/guide/usa/napb-90/cover.jpg>
(retrieved 22 June 2019)

April 27, 2005

Steven Aftergood
Federation of American Scientists
1717 K St, NW
Washington, DC 20036



FEMA

RE: Freedom of Information Act Request
FOIA Case No.: 04-098

<https://fas.org/nuke/guide/usa/napb-90/>
<https://fas.org/nuke/guide/usa/napb-90/front.pdf>
(retrieved 22 June 2019)

Dear Mr. Aftergood:

This letter is in response to Allen Thomson's February 12, 2004 Freedom of Information Act (FOIA) request. In that request, he asked for a copy of "Nuclear Attack Planning Base 1990 Final Project Report," dated April 1987, an out-of-print FEMA publication.

In responding to a FOIA request, the U.S. Department of Homeland Security (DHS)/Federal Emergency Management Agency's (FEMA's) search will include responsive records in its control on the date the search began. FEMA's search began on February 19, 2004.

Your request is granted in full at no cost to you. Please include the following caveat in any further posting of this publication. "This publication was provided by the Federal Emergency Management Agency, Department of Homeland Security, for its academic and historical value only." Enclosed please find the FEMA library reference copy on loan to you for duplication. Kindly return the publication to me when you complete the task and include the url information for your website.

For your information, this FOIA request, including Mr. Thomson's identity and the information made available, is releasable to the public under subsequent FOIA requests. In responding to these requests, FEMA does not release personal privacy information, such as home address, telephone number, or social security number, all of which are protected from disclosure under FOIA Exemption 6.

Thank you for your interest in FEMA's programs and policies.

Sincerely,

A handwritten signature in black ink, appearing to read "Elaine I. Chan".

Elaine I. Chan
General Attorney
Office of General Counsel
500 C St, SW
Washington, DC 20472

Enclosure
Cc: Allen Thomson

Federal Emergency Management Agency

NUCLEAR ATTACK PLANNING BASE - 1990 (NAPB-90)

F I N A L P R O J E C T R E P O R T

TABLE OF CONTENTS

ACKNOWLEDGMENTS.....	v
EXECUTIVE SUMMARY	vii
PART 1. PROJECT OVERVIEW	
A. General Overview	1
1. Purpose	1
2. Scope	1
3. Limitations	2
B. TR-82 vs. NAPB-90	3
1. General Comparisons	3
2. General Characteristics	4
3. Targeting Classes	5
4. Assessments	6
PART 2. PROJECT DEVELOPMENT	
A. Soviet Strategic Policies and Procedures	7
1. Nuclear War-Fighting Objectives	7
2. Nuclear War-Fighting Scenarios	7
3. Targeting Strategies	8
4. Force Application	8
B. Target Selection	9
1. Military Aim Point Editing	9
2. Industrial Aim Point Editing	9
C. Weapon Inventory File	10
D. Targeting Considerations	11
1. Height of Weapon Detonation	11
2. Target Surface Considerations	12
3. Target Vulnerability	12
4. Probability of Damage or Destruction	13
E. Other Considerations	13
1. "Nuclear Winter"	13
2. Electromagnetic Pulse (EMP)	14
3. Strategic Defense Initiative (SDI)	15
F. References	15
PART 3. RISK DEFINITIONS	
A. Direct Effects Risk	19
1. General Overview	19
2. Extent of Risk	19
3. Statistical Overview	20
4. Methodology Employed	20
a. Very High Direct Effects Risk	21

(1) Definition	21
(2) Criteria	21
(3) Overview	21
b. High Direct Effects Risk	21
(1) Definition	21
(2) Criteria	22
(3) Overview	22
c. Medium Direct Effects Risk	22
(1) Definition	22
(2) Criteria	22
(3) Overview	23
d. Low Direct Effects Risk	23
(1) Definition	23
(2) Criteria	23
(3) Overview	23
B. Fallout Risk	23
1. General Overview	23
2. Extent of Risk	26
3. Statistical Overview	27
4. Methodology Employed	27
a. Very High Fallout Risk	28
(1) Definition	28
(2) Criteria	28
(3) Overview	30
b. High Fallout Risk	30
(1) Definition	30
(2) Criteria	30
(3) Overview	32
c. Medium Fallout Risk	32
(1) Definition	32
(2) Criteria	32
(3) Overview	33
d. Low Fallout Risk	33
(1) Definition	33
(2) Criteria	33
(3) Overview	35
C. Thermal and Secondary Fire Risk	35
1. General Overview	35
2. Composition of the Fire Risk	36
a. Origination	36
(1) Relationship to Overpressure	36
(2) Primary Fire Starts	37
(3) Secondary Ignitions	38
b. Growth	38
(1) Area Density	38
(2) Simultaneous Burning	39
(3) Fuel Load	39
c. Severity	40
(1) Relationship to Overpressure	41
(2) Burn Time	41

(3) Potential Energy	42
(4) Mass Fire/Firestorm Potential	44
3. Statistical Overview of Risk	46
4. Methodology Employed	46
a. Very High Fire Risk	47
(1) Definition	47
(2) Criteria	47
(3) Overview	47
b. High Fire Risk	47
(1) Definition	47
(2) Criteria	47
(3) Overview	48
c. Medium Fire Risk	48
(1) Definition	48
(2) Criteria	48
(3) Overview	48

ANNEX A: DIRECT EFFECTS/FIRE RISK - STATISTICS & MAPS

ANNEX B: FALLOUT RISK - STATISTICS & MAPS

A C K N O W L E D G M E N T S

This report represents many hours of work by professionals in and out of government whose experience and knowledge covered a wide spectrum of academic and governmental disciplines in nuclear weapons effects and civil preparedness planning. Grateful acknowledgment is made for the contributions of participants of the informal Nuclear Attack Planning Base - 1990 Working Group who met voluntarily to discuss, debate, and decide policy and planning considerations. In this regard, special acknowledgment should be made of the high degree of professionalism displayed by Donald Moore and his staff in the Systems Development Division, OP-IR-SD, in the generation of computer data for Working Group discussions and for this report.

Lastly, I must acknowledge the welcome advice, encouragement, and generous support accorded this project by Joseph A. Moreland, Assistant Associate Director, SL-EM.

The final shape and thrust of NAPB-90 is the result of the unstinting dedication, enthusiasm, and effort of all project participants.

Ronald F. Treichel
Executive Officer, SL-EM
NAPB-90 Project Coordinator

NUCLEAR ATTACK PLANNING BASE - 1990

EXECUTIVE SUMMARY

PROJECT OVERVIEW

<https://fas.org/nuke/guide/usa/napb-90/>
<https://fas.org/nuke/guide/usa/napb-90/execsum.pdf>
(retrieved 22 June 2019)

The NAPB-90 project was an in-house project of the Federal Emergency Management Agency (FEMA) carried out over a year and a half from early 1985 to 1986. The project was coordinated by the Office of Emergency Management Programs, State and Local Programs and Support Directorate, and involved professionals and experts from FEMA directorates and offices, other Federal departments and agencies, and the private sector.

The NAPB-90 is an estimate of the potential physical effects of a nuclear attack on the population of the United States in terms of the degree of the potential risk.

Three types of potential nuclear attack effects risks and the areas and populations affected by each are defined:

- The direct effects risk from blast overpressure generated by the explosion of a nuclear weapon;
- The potential thermal and secondary blast-ignited fire risk created by the combined effects of blast overpressure damage and the thermal pulse or fireball of a weapon; and
- The fallout risk from radiation generated by surface-burst weapons.

The development of the planning base followed detailed studies of all aspects of nuclear attack planning, but despite such efforts specific confidence limits cannot be assigned to either implicit or explicit assumptions used regarding targeting, weapon yields and designs, heights of burst, and delivery system accuracy and reliability. In short, NAPB-90 does not (and cannot) claim total realism.

PROJECT DEVELOPMENT

An initial study of Soviet military objectives, war-fighting scenarios, targeting strategies, and force applications provided the basis for many of the developmental procedures and policies of NAPB-90. In the development of the target base, for example, close attention was paid to frequent Soviet references to damage limitation strategies, particularly those involving non-target resources of the enemy. This element significantly influenced procedures used in making final possible enemy target selections.

NAPB-90 is a scenario-independent study since Soviet targeting priorities (as well as their strategic objectives) remain essentially the same regardless of the a priori scenario under which their weapons would be employed.

All of the NAPB-90 targets were developed and carefully edited to conform to both Soviet-declared strategic objectives and force deployment principles. Initial and subsequent iterations of the target base were compared against listings of projected 1990 Soviet strategic nuclear forces in order to assure logical weapon employments. All aim points finally selected were attacked using Soviet strategic targeting procedures to assure realistic weapon employment. In this respect, the following targeting factors were used in weapon selection and employment:

- The height of weapon detonation representing the height which would be selected by the Soviet strategic planner for weapon detonation;
- The Soviet views regarding expected surface characteristics of selected U.S. targets which would influence the extent of blast overpressures generated;
- The vulnerability of U.S. targets to blast overpressures assumed by the Soviet planner; and
- The probability of damage or destruction of the target influenced by the accuracy of the Soviet weapon and its probability of arrival on target.

In short, all Soviet weapons were employed as if by a Soviet strategic planner. Thus, NAPB-90 is not a "mirror-image" attack in which weapons and targets are chosen from a U.S. point of view.

RISK DEFINITIONS

Direct Effects - NAPB-90 defined the potential risk from nuclear weapon blast overpressures as the total area affected by 0.5 pound per square inch (psi) or more. This represents 727,112 square miles of the U.S. with an estimated resident population of 175.1 millions. Since NAPB-90 does not target population per se, the persons affected by blast overpressures reside in areas which are peripheral to or collocated with potential military and industrial targets.

Four degrees of the potential risk from blast overpressure were delineated, based on the severity of short-term threat from the blast wave itself and its potential to kill or injure; the potential long-term severity to survivors within the blast area; and the kind, degree and practicality of in-place and/or crisis-general measures necessary for protection.

- Very High Direct Effects Risk Areas were defined as areas surrounding target aim points which have the potential to experience blast overpressures equal to or greater than 10.0 psi from a nuclear detonation(s). Approximately 47.2 million persons (19 percent of the population) reside in Very High Direct Effects Risk Areas which cover approximately 46,352 square miles.
- High Direct Effects Risk Areas were defined as areas around a target aim point which have the potential to experience blast overpressures from a nuclear weapon detonation of equal to or greater than 5.0 psi

but less than 10.0 psi. Approximately 32.2 million persons (13 percent of the population) reside in High Direct Effects Risk Areas which cover approximately 49,896 square miles.

- Medium Direct Effects Risk Areas were defined as areas around target aim point which have the potential to experience blast overpressures from a nuclear weapon detonation(s) of equal to or greater than 2.0 psi but less than 5.0 psi. Approximately 50.3 million persons (21 percent of the population) reside in Medium Direct Effects Risk Areas which cover approximately 151,535 square miles.
- Low Direct Effects Risk Areas were defined as areas around target aim point which have the potential to experience blast overpressures from a nuclear weapon detonation(s) of equal to or greater than 0.5 psi but less than 2.0 psi. Approximately 45.4 million persons (19 percent of the population) reside in Low Direct Effects Risk Areas which cover approximately 479,329 square miles.

In sum, approximately 72 percent of the U.S. population is potentially affected by blast overpressures 0.5 psi or more, with 67 million persons living outside the total area defined as at direct effects risk.

Fallout Risk - The potential risk from fallout radiation generated by ground-burst weapons is vast and far-reaching. NAPB-90 defined the entire continental U.S. as under this potential risk, basing its risk assessment on the potential effect of fallout radiation on the resident population over a period of one week following the deposition of fallout and the efficacy of shelter protection to mitigate such exposure. Longer-term effects (additional cancer deaths and potential death in future progeny) were also considered.

To determine risk levels for U.S. counties, NAPB-90 employed the combined results of 12 "most-likely" wind patterns--one such pattern for each month of the year--and used the highest resulting radiation effect in each county as its potential risk level.

Four levels of potential fallout risk were defined:

- Very High Fallout Risk Counties were defined as those which have the potential to receive a one-week unprotected radiation dose of equal to or greater than 15,000 roentgens (R). The counties which were defined at this risk level have resident populations totaling 9.6 millions (4 percent of the U.S.) and cover approximately 421,669 square miles.
- High Fallout Risk Counties were defined as those which have the potential to receive a one-week unprotected radiation dose of equal to or greater than 6,000 roentgens but less than 15,000 roentgens. The counties which were defined at this risk level have resident populations totaling 49.2 millions (20 percent of the U.S.) and cover approximately 624,407 square miles.

- ° Medium Fallout Risk Counties were defined as those which have the potential to receive a one-week unprotected radiation dose of equal to or greater than 3,000 roentgens but less than 6,000 roentgens. The counties which were defined at this risk level have resident populations totaling 62.6 millions (26 percent of the U.S.) and cover approximately 618,811 square miles.
- ° Low Fallout Risk Counties were defined as those which have the potential to receive a one-week unprotected radiation dose of less than 3,000 roentgens. The counties which were defined at this risk level have resident populations totaling 120.8 millions (50 percent of the U.S.) and cover approximately 1,886,339 square miles.

NAPB-90 does not recommend the types and degree of shelter protection best suited to the individual fallout risk areas, but rather delineates the short and long-term consequences of selecting shelter of varying quality, stressing that the ultimate aim is "zero exposure."

Fire Risk - The risk of potential thermal and secondary blast-ignited fires created is directly related to the risk from blast overpressures. Hence, NAPB-90 defined the fire risk as coexistent with that risk, delineating three degrees of risk:

- ° Very High Fire Risk Areas exist where blast overpressures equal or exceed 5.0 psi, that is, the areas defined as at very high and high direct effects risk. Survivors in these areas would almost certainly perish should any fires occur since search and rescue, evacuation, and fire fighting are considered almost impossible to accomplish.
- ° High Fire Risk Areas exist where blast overpressures are greater than 2.0 psi but less than 5.0 psi, that is, the areas defined as at medium direct effects risk. The characteristics of damage created by this range of overpressure (generally standing but heavily damaged buildings) are conducive to the generation and spread of mass fires. As in the Very High Fire Threat Area, emergency operations to assist survivors as well as to control or extinguish fires are almost impossible to accomplish.
- ° Medium Fire Risk Areas comprise the remainder of the area of potential blast overpressure, that is, the area experiencing equal to 0.5 psi but less than 2.0 psi. While blast-induced fires are less likely at this range of overpressure, thermal ignitions remain a distinct hazard, particularly when such ignitions occur indoors.

PART 1. PROJECT OVERVIEW



napb-90

<https://fas.org/nuke/guide/usa/napb-90/>
<https://fas.org/nuke/guide/usa/napb-90/part1.pdf>
(retrieved 22 June 2019)

A. General Overview - The NAPB-90 project was an in-house effort of the Federal Emergency Management Agency (FEMA) carried out over a year and a half from early 1985 to 1986. The project was developed and coordinated by the Office of Emergency Management Programs, of the State and Local Programs and Support Directorate, and involved professionals and experts from FEMA directorates and offices, other Federal departments and agencies, and the private sector.

1. Purpose - The current nuclear attack planning base outlined in FEMA publication TR-82, "High Risk Areas for Civil Preparedness Nuclear Planning Purposes," which represented a 1975 assessment of the potential effects of nuclear attack through 1985. Since its publication, major changes have occurred which make this planning base obsolete. These changes are discussed below. NAPB-90 replaces TR-82 and provides a nuclear attack planning base for assessing and planning for preparedness measures for today and through 1990. The unprecedented destructiveness of strategic nuclear weapons and the possibility (however remote) of their use in war deserve the serious concern of government at all levels.

2. Scope - NAPB-90 is an estimate of the potential physical effects of a nuclear war on the population and land area of the United States in terms of the degree of the potential risk from these effects. In developing such risk assessments, the project incorporated publicly available data on Soviet nuclear warfighting objectives; the strategic nuclear arsenals available to carry out such an attack; and Soviet targeting objectives and force deployment procedures.

Three types of potential nuclear attack effects risks and the areas and populations affected by each are defined by NAPB-90:

- The potential direct effects risk from blast overpressure generated by the explosion of a nuclear weapon (measured in pounds per square inch [psi] over normal air pressure);
- The potential risk from thermal and secondary blast-ignited fires created by the combined effects of blast overpressure damage and the thermal pulse (or fireball) of a weapon; and
- The risk from potential fallout radiation generated by surface-burst nuclear weapons.

All attack effects were determined using the FEMA READY nuclear effects assessment system and the FEMA Population Grid File (PGF). All computer work was under the supervision of the Computer Systems Division, Office of Information Resources Management, Emergency Operations Directorate. In most instances, NAPB-90 potential risk areas were defined to match complementary preparedness measures necessary to mitigate weapon effects, as well as long-term steps to maintain life support in the threat area. Risk area definitions are found in Part 3, "Risk Definitions." Specifically identified areas and populations affected are outlined in Part 3.A. "Direct Effects Risk;" Part 3.B., "Fallout Risk;" and Part 3.C., "Thermal and Secondary Blast Fire Risk." Annexes A and B contain statistics and maps concerning these threats.

3. Limitations - NAPB-90 was developed after detailed studies of all aspects of nuclear attack planning. Despite such efforts, there is no way to assign specific confidence limits to either the implicit or the explicit assumptions used regarding targeting, weapon yields and designs, heights of burst, accuracy, and delivery system reliability. The only confidence which can be claimed by NAPB-90 is that it represents a credible estimate of the potential risk from a large-scale nuclear attack on the U.S., having been constructed on logical, studied assumptions and available empirical data. Hence:

- NAPB-90 cannot be used to predict how a nuclear war would be fought against the U.S. but merely identifies areas and populations which are at potential risk from nuclear weapon effects;
- NAPB-90 does not speculate on the strategic priority which might be given specific targets by Soviet planners (although an overriding assumption would be that destruction of U.S. strategic counterforce facilities would be a very high priority). The planning base, therefore, represents no specific war-fighting scenario;
- NAPB-90 acknowledges only the classes of targets used in the development of the planning base but does not identify individual targets by their strategic value (see Part 2.b., "Target Selection");
- NAPB-90 makes no assumptions regarding potential population casualties acknowledging only the numbers of residents, day-to-day populations within defined risk areas; and
- NAPB-90 does not purport to be totally predictive (100 percent correct) in its presentation of potential risks from direct effects, fire, and fallout. This is particularly true for fallout risk area definitions where the total risk following an attack would be driven by weather conditions at that time.

In short, no nuclear attack planning base or any study involving nuclear war can claim total accuracy since there is no way of knowing Soviet war plans.

B. TR-82 vs. NAPB-90 - As stated earlier, the purpose of the NAPB-90 project was to update and replace the nuclear attack planning base represented in FEMA publication TR-82, 1979. While a comparison of the differences between TR-82 and NAPB-90 is difficult since each base approached the problem of defining risk uniquely, the following is presented as illustrative of the differences in the approaches to define potential risks.

1. General Comparisons - While NAPB-90 projections on populations and areas subject to nuclear attack effects are configured differently than in TR-82, a general comparison of compatible data can illustrate the significant differences between the two bases.

To determine risk areas, NAPB-90 employed the FEMA Population Grid File (PGF) which divides the U.S. land area into squares of 2 minutes latitude and longitude. Each square is approximately 2 1/4 miles per side, or roughly 5 square miles in area. The center of each square is used as a reference point for all resources within the square. A total of approximately 115,000 such points constitute the entire file.

Overpressure computations were done at 2-mile intervals from the assumed ground zero (detonation point or AGZ) of a weapon for total distances of 25 miles in all compass directions. These generated 2-mile intervals from the AGZ coincide with the grids of the PGF.

Fallout computations were done at 10-mile intervals, effectively at each corner of a 10-mile grid using approximately 55,000 such points.

The basic data of each grid point are the resident population of the square and standard Bureau of the Census geographic codes (State, county, minor civil division, and Standard Metropolitan Area, as applicable). In addition, applicable resources data were identified by geographic location (i.e., latitude and longitude coordinates), summarized, and "attached" to the appropriate PGF point. Finally, overpressure and fallout effects were overlaid on the PGF for effects analysis.

The developers of TR-82 used the bounding limit of 2.0 psi overpressure as a definition of risk from nuclear detonations. The reason for this choice is sound, but NAPB-90 expanded and refined this single definition of blast risk. This bounding limit, however, provides a basis for a general comparison between NAPB-90 and TR-82. There were 829 whole counties which the TR-82 planning base defined as having at least one PGF point at 2.0 psi or more overpressure.

Using the same measurement for comparison of the two planning bases, there were 326 counties included in this risk definition in the NAPB-90 but which were not so identified in the TR-82 base, i.e., newly identified as at this risk level. Conversely, 190 counties at this risk level in TR-82 were no longer identified at this risk level in NAPB-90.

In sum, a total of 972 counties--a net increase of 136 counties--was identified at this risk level by NAPB-90.

Using estimated 1985 populations of only those PGF points in both planning bases which meet the 2.0 or more psi risk definition provide another comparison between the two bases:

	<u>TR-82</u>	<u>NAPB-90</u>
Population at 2 psi risk or greater	155.86 Million	129.74 Million
Population outside 2 psi risk area	85.79 Million	111.91 Million
Total 1985 U.S. population	241.65 Million	241.65 Million

As stated earlier, the reasons for this difference are numerous but can be summarized by stating that NAPB-90 was developed from a strategic targeter's force application viewpoint (how weapons would logically be used against targets). By contrast, the TR-82 planning base weapon employments deliberately created a "worst-worst" risk environment through the employment of all weapons in both air- and ground-burst modes for each aim point.

A secondary but important reason for this difference can be found in the weapon yields employed by both planning bases. The average assumed yield of all weapons used in NAPB-90 is slightly less than 1 megaton, reflecting the trend in Soviet (and in U.S.) strategic inventories toward smaller, more accurate weapons. By contrast, TR-82 employed then-current, high-yield Soviet weapons with yields as high as 20 megatons.

2. General Characteristics - The NAPB-90 and TR-82 planning bases have the following general characteristics in common, in opposition, or singularly:

- | <u>TR-82</u> | <u>NAPB-90</u> |
|---------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|
| • Risk assessment (see below) based upon "worst-worst" weapon employment | • Risk assessments based upon estimates of Soviet weapon employment |
| • Target priorities by class acknowledged but not used in application to preparedness programs (all risk areas assumed to be at equal risk) | • SAME; no change |
| • Illustrated publication showing maps with 2 psi blast envelopes (red) and high fallout risk counties (green) | • TO BE DETERMINED |
| • Planning base information made available for unlimited distribution to State and local governments and the public | • SAME; deployment to be determined |

3. Target Classes - The NAPB-90 and TR-82 planning bases have the following target class characteristics in common, in opposition, or singularly:

TR-82

- Selection of target classes based on the following criteria in descending order of priority:
 - U.S. Military Installations
 - NO COMPARABLE CLASS (included in target class above)
 - Military-Support Industry, Transportation, and Logistics
 - Other basic industries and facilities that contribute significantly to maintaining U.S. economy
 - Population concentrations of 50,000 or more (Bureau of Census urbanized areas) not otherwise targeted
 - NO COMPARABLE CLASS
 - Based on 1980 projections of Soviet capabilities; weapon employments developed considering active U.S. defenses, vulnerability, and time-sensitivity of targets; maximized target destruction; minimized weapons employed
 - Probable targets reviewed to eliminate isolated military and industrial facilities considered of marginal significance

NAPB-90

- Selection of target classes based on recent data and the following headings:
 - Strategic Military Installations
 - Non-Strategic, Other Military Installations and Bases
 - SAME, less Transportation and Logistics
 - NO COMPARABLE CLASS
 - NO COMPARABLE CLASS
 - Ports
 - Petroleum Refineries
 - Political
 - Electric Power Plants
 - Chemical Industries
- Virtually the same technique; used current-to-1990 Soviet weaponry; time-sensitivity of targets not a consideration
- Editing of target classes done to conform with perceived Soviet strategic principles

- States given an opportunity to present justification for addition or deletion of targets they deemed at risk from nuclear attack effects; approved or disapproved at national level

- Virtually the same; methods of implementation to be determined

4. Assessments - The NAPB-90 and TR-82 planning bases have the following risk assessment characteristics in common, in opposition, or singularly:

TR-82

- All weapons air burst to maximum ground range of 10.0 psi overpressure to attain worst case
- Blast envelopes depicted risk areas subject to a 50 percent or greater probability of receiving 2.0 psi overpressure or more
- Risk from thermal fire assigned to extent of 2.0 psi risk area
- All weapons ground burst to maximize fallout radiation for worst case
- High-risk fallout areas (whole counties) designated where there was 50 percent or greater probability of receiving an H+1 dose rate of 10,000 R or greater per hour for any of four seasonal winds (1975 publication only)

NAPB-90

- Weapons employed in accordance with perceived Soviet force application and targeting principles
- Four direct effects risk levels identified (see Part 3.A., "Direct Effects Risk")
- Thermal and secondary blast fire fire risk identified (see Part 3.C., "Thermal and Secondary Blast Fire Risk")
- Fallout radiation risk determined from ground-burst weapons only
- Four fallout radiation risk levels identified (see Part 3.b., "Fallout Risk")

A. Soviet Strategic Policies - An initial study of Soviet military objectives, war-fighting scenarios, targeting strategies, and force applications provided the basis for many of the development procedures and policies of NAPB-90.

The study examined stated Soviet views on how they envisioned a nuclear war against the U.S. would be fought. Observations relevant to the development of NAPB-90 were adopted to the extent possible.

1. Soviet Nuclear War-Fighting Objectives - Almost all official pronouncements on this subject (culled from Soviet media) indicate that their main objective in a nuclear war is to attain "victory" over the enemy. Victory, by Soviet definition, is the destruction of the enemy government that started the war, and the disarming and neutralization of the enemy's military forces. Such a war is usually described as "imperialistic" forces facing "socialism" or "socialist coalitions."

In the development of the NAPB-90 target base, close attention was paid to frequent Soviet references to limiting damage to non-target resources of the enemy. This damage-limiting element of the Soviet nuclear war-fighting objectives significantly influenced the procedures used in making final NAPB-90 target aim point selections.

2. Soviet Nuclear War-Fighting Scenarios - Another important influence in the NAPB-90 development was how the Soviets perceived nuclear war would begin and how each scenario would effect their selection of potential targets. The Soviets see three possible scenarios as most likely to start a nuclear war:

- Preemptive attack on strategic warning of enemy attack;
- Launch on tactical warning; and
- Attack in retaliation for being attacked.

Under all of these scenarios, Soviet targeting objectives remained the same. The final NAPB-90 was, therefore, designed to reflect these objectives and is not a prediction of the results of any war-fighting scenario envisioned by the Soviets or by U.S. planners. The decision to make the NAPB-90 planning base scenario-independent is reinforced by the fact that Soviet targeting priorities, as with their objectives, "remain essentially the same" regardless of the a priori scenario under which weapons would be employed.

It was also significant to note that should the Soviets be faced with their scenario which calls for a retaliatory strike after being attacked, they do not see such a strike as "...designed simply to inflict an unacceptable level of damage, the threat of which should have deterred the enemy in the first place."

As to how long a nuclear conflict would last, the Soviets believe that a war "...is more likely to begin with a crisis period in which both sides would ready their forces and take measures to protect their economics (sic) and population." Also, most Soviet authorities see a conventional war phase preceding a nuclear war, with escalation into the use of nuclear weapons as "inevitable."

These Soviet perceptions on the conditions under which nuclear war would start were important factors in determining NAPB-90 planning policies and assumptions to mitigate the nuclear effects risk environments that might result.

3. Soviet Targeting Strategies - Publications carrying speeches and articles by top Soviet military and political leaders make clear that the targets of the Soviet "Strategic Nuclear Forces" reflect their objectives discussed above. Specific NAPB-90 target selection (discussed at length elsewhere in this paper) is based on these Soviet target selections. An important point in their selections is that population, as such, is not specified as a Soviet target.

4. Soviet Force Application - The Soviet application of their nuclear targeting strategy follows these force-application principles, most of which influenced the development of the NAPB-90 target base:

- Destroy "most threatening" enemy forces;
- Select "main links and nodes" in target "sets" (such as the National Command Authority);
- "Do not destroy large areas or create radioactive deserts;"
- Use minimum weapon yields ("explosive power") necessary so as not to drastically "overkill" the target;
- "Prepare to strike most important targets twice;" and
- "It is not possible, nor desirable, nor necessary to attack and destroy all targets (in the operational zone)."

These force-application principles (among many more) agree with Soviet doctrines and strategies discussed above. The "enemy" is to be defeated through destruction of its military forces and by preventing their reconstitution.

B. NAPB-90 Target Selection Considerations - Ten target classes containing 6,139 aim points were included in an initial target set as follows:

<u>Target Class</u>	<u>Aim Points</u>
• ICBM silos and launch control centers	1,228
• Other Air Force facilities and complexes	199
• Other Army facilities and complexes	159
• Other Navy facilities and complexes	110
Total other military facilities and complexes ...	(468)
• Key military-support industries	325
• Political infrastructure	44
• Ports and port facilities	106
• Petroleum refineries	242
• Electric power generating facilities	1,632
• Chemical industry facilities	<u>2,094</u>
Total Initial Aim Points.....	6,139

The initial target set served as a basis for aim point editing to meet Soviet strategic objectives.

1. Military Aim Point Editing - In the ICBM silos and launch control center class, all aim points included in the Titan missile complexes at Little Rock Air Force Base (AFB), Little Rock, Arkansas; McConnell AFB, Wichita, Kansas; and Davis Monthan AFB, Tucson, Arizona, were eliminated. All of these missile complexes are being or will be phased out within the 1985-1990 period and will, therefore, cease to be potential targets.

2. Editing of Industrial Aim Points - Over 60 percent of the original aim points listed above occurred in three target classes: petroleum refineries, electric power generating facilities, and chemical industry facilities. This large number made it obvious that these classes would require extensive editing since they covered the majority of industrial facilities in each class, a large number of which were small industries not considered significant enough to be included for national damage assessment purposes.

a. Editing of Petroleum Refineries Class - For the editing of the petroleum refineries class, no refinery with a capacity of less than 75,000 barrels per day was considered a potential target. The remaining industries in the class were targeted. It was assumed that a rank order degradation of refinery capacities to an assured level of 75 percent damage or destruction would constitute effective neutralization of the industry without its total destruction.

b. Editing of Electric Power Generating Facilities Class - For the editing of the electric power generating facilities class, facilities were ranked ordered by generating capacity. These site capacities were then selectively targeted until an assured 75 percent degradation was achieved. This level of degradation was assumed to effectively neutralize the capability of

the electric power grid network to transmit or exchange generated power, and also did not totally destroy the industry as a whole.

c. Editing of Chemical Industry Class - The basis for editing the chemical industry class was a Stanford Research Institute study done for the Office of Civil Defense in 1968. This study was an assessment of the severity of damage to the chemical industry as a result of nuclear war. It indicated that the worst-case scenario for the chemical industry as a whole would be the damage or destruction of those chemical facilities furnishing "basic" chemicals--chemicals necessary or common to a chemical industry itself as well as to other industries. These basic chemical industries include those which manufacture alkalines and chlorines, industrial gases, inorganic and organic chemicals, and pigments (grouped under the Standard Industrial Code 281 category). Aim points for this category were selected and targeted to provide an assured neutralization of all other chemical industries. These aim points replaced the initial chemical class listing.

C. NAPB-90 Weapon Inventory File - The Soviet strategic weapon arsenal used as the initial NAPB-90 weapon inventory file was developed from a Soviet inventory published in a report by the Congressional Budget Office (CBO) titled "Counterforce Issues for U.S. Nuclear Forces," January 1978. The report projected Soviet strategic forces through 1985. Since NAPB-90 is intended to reflect a threat planning base through 1990, the CBO data were selectively modified to reflect probable changes in currently deployed Soviet strategic forces through 1990. Table C-1 shows the initial CBO data together with the predicted changes. Notes on these and other changes reflect 1990 Soviet strategic weapon deployments reflected in a Department of Defense report, "Soviet Military Power," fourth edition, April 1985.

Table C-1. Established Soviet Military Forces, 1985

<u>Launch Vehicle</u>	<u>Number in Inventory</u>	<u>Warheads Each</u>	<u>Total</u>
<u>INTERCONTINENTAL BALLISTIC MISSILES</u>			
SS-11 1/	420	1 ...	420
SS-13 2/	60	1 ...	60
SS-17 3/	150	4 ...	600
SS-18 4/	308	10 ...	3030
SS-19 5/	<u>360</u>	6 ...	<u>2160</u>
TOTAL ICBM	1298		6300
<u>SUBMARINE-LAUNCHED BALLISTIC MISSILES</u>			
SS-N-6/8 6/....	600	1 ...	600
SS-N-17/18 7/... .	<u>300</u>	3 ...	<u>900</u>
TOTAL SLBM	900		1500

Notes on projected 1990 force posture are found on next page.

- 1/ Mods #2 and #3 are principally deployed; 420 launch vehicles total.
- 2/ No change from 1985 deployment posture.
- 3/ Mod #3 deployed; 150 launch vehicles total.
- 4/ Mod #4 deployed; 308 launch vehicles total with 10 warheads each.
- 5/ Mod #3 deployed; 360 launch vehicles.
- 6/ For the SS-N-6, Mods #2 and #3 deployed; Mod #3 will have 2 warheads each. For the SS-N-8, Mod #2 deployed.
- 7/ The SS-N-17 had limited deployment. For SS-N-18, Mod #3 deployment is assumed; will have 7 warheads each.

New Vehicles: ICBMs: SS-X-24 and SS-25 have limited deployment.

SLBMs: SS-N-20 deployed; 6 to 9 warheads each. SS-NX-23 to be deployed on Delta IV class submarines.

Although standard weapon employment procedures were followed, closer attention was paid to the assumed weapon yields which could influence the extent and degree of potential risk, as well as the probability of that risk occurring in a given area than to the weapon delivery system employed.

While all actions were taken to ensure a realistic representation of Soviet strategic nuclear force applications, it should be emphasized that NAPB-90 does not attempt to predict the specific weapons applications of Soviet strategic planners. The structure of the final Soviet weapon systems used has, therefore, little relevance to the planning purpose of the base, i.e., to depict potential nuclear weapons effects.

D. Targeting Considerations - It was pointed out earlier that one of the principal differences between the TR-82 planning base and NAPB-90 lay in the manner in which weapons were employed against potential targets. NAPB-90 aim points were attacked using estimates of Soviet strategic targeting procedures, i.e., Soviet views on nuclear weapons effects and target vulnerabilities. The following discusses targeting considerations employed by NAPB-90:

1. Height of Weapon Detonation - A nuclear weapon generates very large blast overpressures. The range or extent of this blast overpressure is closely related to the height of burst (HOB) of the weapon. Nominally, this is referred to as an "optimum HOB" since it represents the height chosen by the strategic planner to maximize desired levels of overpressures over the widest possible area. A particular overpressure level is chosen to assure the desired damage or destruction of the target.

The optimum HOB selected for NAPB-90 "soft" or area targets (such as a large industrial facility) normally precludes the weapon's fireball from reaching the ground. In these cases, the weapon can be said to be "air-burst."

When the fireball in whole or in part touches the ground, the weapon is considered "surface-burst." NAPB-90 employed surface burst weapons against "hard" or point targets (such as missile siloes).

In both cases, NAPB-90 weapons were employed at an altitude which assured generation of the overpressure believed necessary to damage or destroy the potential target.

2. Target Surface Characteristics - NAPB-90 weapon employment considered the influences on the extent of overpressure generated by weapon detonations--ranges significantly influenced by the surface characteristics of the target. These characteristics have a marked effect on the range of overpressures, each surface characteristic having its own optimum HOB to maximize particular psi overpressures. The reasons for these differences are discussed below.

- Ideal surfaces are perfectly flat terrain and reflect all of the over-pressure (or "mechanical") and thermal (or "heat") energies of the weapon, i.e., nothing inhibits the spread or range of these effects. Ideal surfaces are used as a hypothetical "base case" for weapon characteristics. No such surfaces exist on earth.
- Near-ideal surfaces are "reasonably" flat terrains and reflect most of the mechanical and thermal energy of the weapon. Ice, hard-packed snow, water, and frozen tundra are examples of this type of surface. Inhibitions of generated energies on this type of surface are small.
- Non-ideal surfaces are flat to uneven terrains which can interact with the thermal energy of the weapon through ignition of surface material and the generation of large amounts of dust and debris. The dust and debris absorb some of the thermal energy and heat the air above normal temperature around the target. Together with the dust, this higher air temperature "pocket" interacts with the reflection of the blast wave off of the surface and a "precursor" or leading pressure wave is formed. The result is that the range of mechanical overpressures is reduced and the dynamic or "punch" pressure is increased.

Weapon effects on near- and non-ideal surfaces can be further influenced by types of soil, the degree and density of vegetation, and the amount of moisture present in the area. All of these additional characteristics inhibit the range of overpressures. Strategic planners refer to such surface characteristics as "grey areas" in calculating optimum HOB's.

3. Target Vulnerability - The choices of weapons employed by NAPB-90 were based upon the weapon HOB necessary to maximize selected overpressures. The overpressure selected was based upon the vulnerability of the target and the desired level of damage or destruction to be achieved. The "soft" targets discussed earlier are generally vulnerable to low levels of overpressure (some industrial plants will sustain substantial damage at as low as 3.0 psi). "Hard" targets require very much higher overpressures to effect damage or destruction.

As a general rule, then, a soft target in the NAPB-90 listing was attacked with an air-burst weapon to achieve the widest possible range of the desired blast overpressure and employment of the weapon did not generally result in

the creation of fallout (see a discussion of this in Part 3.B., "Fallout Risk"). The converse applied to very low or surface-burst weapons which NAPB-90 employed against hard targets.

4. Probability of Damage or Destruction - A strategic planner works to assure that a chosen target will be damaged or destroyed. If all weapon employment considerations are correct and the weapon detonates at the aim point, damage or destruction will (theoretically) be assured. Weapon systems, however, are not 100 percent reliable. To add assurance that the goal will be met, NAPB-90 weapon employment considered two other factors:

- The accuracy of the weapon - NAPB-90 aim points represented the desired point of weapon detonation (nominally, the "desired ground zero" or DGZ). Weapon guidance systems, however, will usually deviate from this DGZ by a predictable distance and probability. The amount of this deviation, measured in feet from the DGZ, represents the radius of a circle around the DGZ within which the weapon can be expected to impact a warhead at least 50 percent of the time. This deviation is called the "circle error probable" or CEP of the weapon. NAPB-90 weapon employed considered CEP's to determine the HOB of the weapon to ensure that desired overpressure ranges would reach the target.
- The probability of arrival of the weapon - This is an expression of the combined probability the launch vehicle will (1) have a successful launch; (2) follow its programmed trajectory or course; and (3) its weapon detonates upon arrival at the target. NAPB-90 considered the probability of arrival of the weapon to determine if multiple weapons were needed to ensure destruction of the target.

E. Other NAPB-90 Considerations

1. "Nuclear Winter" - In 1984, a group of scientists produced a study which hypothesized that a large-scale attack on the U.S., principally against urban areas, would result in an injection into the atmosphere of an inordinate amount of smoke and soot from attack-generated fires. Their study (called "TTAPS" after the initials of the co-authors) predicted that a severe drop in temperature or a "Nuclear Winter" would result from the sun's energy being absorbed by the cover of smoke and soot. The study produced widespread interest within the scientific community, the media, and among the general public.

In the intervening time since its publication, a large number of scientists (including some of the original authors) and scientific organizations (such as the National Academy of Sciences) have acknowledged that there are uncertainties connected with the original hypothesis. Some investigations made since the TTAPS study have suggested that the amount of smoke and soot produced may be much less than that predicted by the study. Weather conditions, such as cloud cover and turbulence due to uneven smoke and soot distributions, may accelerate the "cleansing" of the atmosphere more rapidly

than originally suggested. The hypothesis also depends on a number of broad assumptions of local weather conditions, the distribution pattern of the smoke and soot in the upper atmosphere, the number and location of targets that will be attacked, the amount of available fire fuel in the target area which will ignite and burn, and the like. The current trend in both Soviet and U.S. warheads toward more accurate, low-yield weapons designed to limit collateral damage around a target has also suggested the effects may be less severe than those suggested by the study.

Until these uncertainties are resolved, the concept of a "nuclear winter" as predicted by the TTAPS study does not justify a shift in current civil preparedness planning and policy. Until more research and study are carried on this potential phenomenon, such an hypothesis cannot be incorporated into a civil preparedness planning base.

In the interim, NAPB-90 provides an objective analysis of the known potential nuclear attack effects.

2. Electromagnetic Pulse (EMP) - A secondary but nevertheless important effect of any nuclear detonation appears as an electromagnetic pulse. It is another form of energy released by the weapon in the electromagnetic radiation spectrum. At the high end of this spectrum, the weapon generates initial nuclear radiation (X-rays and gamma rays) at the moment of explosion; thermal radiation energies given off by the explosion are in the infrared and ultra-violet frequencies of the spectrum; and the electromagnetic pulse (composed of electrons) covers the lower end of the spectrum. The frequencies in this part of the spectrum are among those used in electric power generation, many forms of radio and television transmission, and military communications and detection systems.

The EMP effect resulting from a nuclear detonation within the earth's atmosphere is generally not significant, but if high yield weapons are detonated outside of the atmosphere, an efficient conversion of nuclear energy into the electromagnetic frequency range occurs. This energy can cover a very substantial area and has the capability of "coupling with and affecting the operation of electrical and electronic equipment which has not been protected. Examples of EMP damage observed during the atmospheric test programs ranged from damaged cables due to "arc-overs" to the false tripping of street light systems many hundreds of miles from the detonation point. Similar results have been observed for modern, sophisticated equipment exposed to simulated EMP. Such equipment, if not otherwise protected, has a very high probability of becoming inoperative at even very low levels of EMP. In general, the more modern and sophisticated the equipment, the higher the potential for EMP degradation.

These and other concerns about the potential EMP damage to electric power and communications systems certainly demand the attention of emergency planners. Preparedness measures to mitigate the blast, fire, and fallout risks outlined by NAPB-90, as well as long-term measures to maintain life support, must consider the possibility of additional burdens imposed by EMP before, during, or after a nuclear attack.

The effect of the potential use of nuclear weapons to deliberately create an EMP effect is, however, considered to be a war-fighting option. Since NAPB-90 is scenario-independent and does not purport to predict how a nuclear war would be fought, EMP must be considered outside its scope.

3. Strategic Defense Initiative (SDI) - In 1983, the Administration proposed that a strategic defense be initiated to explore the feasibility of providing a defense against ballistic missiles. Research was begun on technologies which could support a capability to engage and destroy hostile ballistic missiles during four phases of the missiles' flight paths:

- The boost or launch phase while the missile is accelerating;
- The mid-course or post-boost phase when the propulsion rockets of the missile have separated from the warhead;
- The mid-course phase when the warhead goes through the topmost section of its ballistic path; and
- The terminal phase when the warhead is in its final descent toward the target.

In short, SDI research is exploring the feasibility of a multi-layered space defense shield along the entire spectrum of the flight of a ballistic missile. What configuration this multi-layered approach will take if employed, is not now known. Hence, the exact relationship of SDI and the civil preparedness program cannot be determined. A deployed strategic defense probably will not be able to determine--in the boost and mid-course phases--which U.S. targets had been spared by the destruction of a single missile. On the other hand, this relationship could be surmised when terminal phase defenses have been emplaced to protect specific targets. For targets not protected by a terminal defense, potential targets following activation of the strategic defense could not be realistically determined.

For the foreseeable future, then, planning against the potential effects of a nuclear war must be based on current and predicted offensive nuclear forces which could be employed against U.S. targets.

F. References - The following publications were used in the development of NAPB-90. Except where noted, all are available in the public domain:

- "The Effects of Nuclear War," Office of Technological Assessment, Congress of the U.S., 1979.
- "Radiological Factors Affecting Decision-Making in a Nuclear Attack," National Council on Radiation Protection and Measurements, Report No. 42, November 1974.
- "High Risk Areas for Civil Nuclear Defense Planning Purposes," FEMA Publication TR-82, September 1979.

- "The Effects of Nuclear Weapons," U.S. Atomic Energy Commission and the Department of Defense, February 1977.
- "Critical Industry Repair Analysis: Electric Power," O. Fendall, Advance Research, Inc., Cleveland, Ohio, April 1963.
- "Studies of Post-Disaster Economic Recovery," L. J. Hill, Oak Ridge National Laboratory, Oak Ridge, Tennessee, June 1985; report prepared for FEMA under an Interagency Agreement with the U.S. Department of Energy.
- "Development of Rapid Shutdown Techniques for Critical Industries," F. R. McFadden, C. D. Bigelow, Stanford Research Institute, Menlo Park, California, January 1966.
- "FEMA Attack Environment Manual," Civil Preparedness Guide Series 2-1, Chapters 1 through 9, Federal Emergency Management Agency, 1982 (some information taken from 1985 update drafts). (Note: CPG 2-1 chapters contain extensive topical bibliographies which are not repeated here.)
- "Casualties Due to Blast, Heat, and Radioactive Fallout From Various Hypothetical Nuclear Attacks on the U.S.," W. Daugherty, B. Levi, F. von Hippel, Center for Energy and Environmental Studies, Princeton, New Jersey, September 1985.
- "Damage to the Basic Chemical Industry from Nuclear Attack and Resulting Requirements for Repair and Reclamation," final report prepared for Stanford Research Institute, URS Systems Corporation, 1968.
- "Nuclear Winter and Deterrence: Coming in From the Cold," Dr. John M. Weinstein, National Defense Magazine, October 1985.
- "Nuclear Battlefields," W. M. Arkin, R. W. Fieldhouse, Institute for Policy Studies, Ballinger Publishing Company, 1985.
- "Calculating the Vulnerability of Synthetic Polymers to Autoignition During Nuclear Flash," R. Hickman, T. Reitter, Lawrence Livermore National Laboratory, March 1985.
- "Soviet Military Power," U.S. Department of Defense, Fourth Edition, April 1985; Fifth Edition, March 1986.
- "Counterforce Issues for U.S. Strategic Nuclear Forces," Congressional Budget Office Report, 1978.
- "Nuclear Winter -- Uncertainties Surrounding the Long-Term Effects of Nuclear War," U.S. General Accounting Office Report to the Congress, March 1986.

- "Less Drastic Theory Emerges on Freezing After a Nuclear War," James Gleick, New York Times news article, June 22, 1986.
- "An Assessment of Protection Factors for FEMA-Designated Fallout Shelters," Dr. J. T. McGahan, Science Applications International Corp., final report to the Defense Nuclear Agency, January 1986.

A. Direct Effects Risk

1. General Overview - Blast overpressures generated by a nuclear weapon detonation present the greatest risk to human life and health in a nuclear effects environment because achieving effective protection is so difficult. The destruction, death, and injury that can result from the blast generated overpressures of modern nuclear weapons are awesome compared to those from the atomic weapons used against Hiroshima and Nagasaki, Japan, in World War II. Although current thermonuclear weapons have diminished in yields (principally because of greater accuracy), the power generated is still magnitudes above that released by the earlier weapons.

Protective measures against direct effects of weapons have been researched and are possible but generally impractical due to the enormous expenditures entailed in the construction of a comprehensive blast shelter system. Over the years, proposals to initiate a combined blast and fallout shelter program have been submitted to the Congress but not accepted. In some areas close to the point of detonation (which can never be predicted accurately) even extensive protective measures may be inadequate and, even if successful in mitigating initial effects, may be insufficient to support continued habitation of the area.

Fire generated by the thermal pulse of the weapon and by damage-induced ruptures in gas and electric lines also could present a formidable risk for survivors close in to the target aim point. The fire risk is discussed in C., below.

Even in areas far enough from the point of detonation to escape severe damage, the population still faces unique survival problems to protect their lives and continued health in the direct effects environment.

2. Extent of Risk - The extent and range affected by this risk are determined by:

- The altitude at which the weapon is detonated (see the discussion of this in Part 2.D., "Targeting Considerations"). The altitude at which the weapon is detonated determines the range of given overpressures.
- The yield of the weapon. The range of a given blast overpressure increases with the cube root of the weapon yield in kilotons and is directly correlated to the height of burst.
- The accuracy of the weapon (see the discussion of this in Part 2.D., "Targeting Considerations"). Weapons used in NAPB-90 were assumed

to have extremely small CEP's. CEP's, therefore, have little effect on the extent of the damage area and influence only the location of the damage.

- The probability of arrival of the weapon (see the discussion of this in Part 2.D., "Targeting Considerations"). Weapons used in NAPB-90 were assumed to have a probability of arrival of 66 percent or greater.

3. Statistical Overview - NAPB-90 defines the potential risk from nuclear weapon blast overpressures as the total area affected by 0.5 pound per square inch (psi) or more. This represents 727,112 square miles of U.S. territory with an estimated resident population of 175.11 millions. Approximately 66.54 million people, therefore, are not considered to be at risk from blast overpressures although some of this number (approximately 2.47 million) reside in areas immediately outside of the 0.5 psi boundary and may experience low levels of blast overpressure (i.e., less than 0.5 psi). Since NAPB-90 does not target population per se, the persons affected by blast overpressures reside in areas which are peripheral to or collocated with potential military and industrial targets (see Part 2.B., "Target Selection").

The magnitude of this potential risk is represented with maps and statistics in Annex A.

4. Methodology Employed - The selection and methodology employed for arriving at potential aim points included in NAPB-90 are discussed in detail in Part 2., "Project Development," and will not be repeated here. In general, direct effects risk areas are the result of considerations discussed in Part 2.D., "Targeting Considerations." Specific criteria used to select critical psi demarcations are included in discussions of these areas.

NAPB-90 defines four levels of potential risk from blast overpressure. Each definition is driven by the degree of influence a specific blast overpressure has on the continued life and health of the resident population. In this context, the following considerations were used in determining the degrees of direct effects risk:

- The severity of short-term risk posed by the blast wave itself in terms of its potential to kill or injure directly, or through damage or destruction of homes and buildings. This short-term risk may include the immediate effects of the weapon's thermal pulse.
- The potential long-term severity of the risk to survivors within the area by entrapment in damaged or destroyed buildings and by fires created by thermal pulse generated and damage-caused ignitions. Fire risk is discussed in C., below.
- The kind, degree, and practicality of in-place and/or crisis-generated preparedness measures necessary to mitigate initial blast, thermal pulse, and initial reation risks as well as measures necessary to assure continued life support for long-term habitation in the area. Also included in this consideration is the cost of such measures in total effort, time of preparation, and efficacy.

The potential risk from initial radiation released at the time of detonation is considered by NAPB-90 to be reciprocal with the risk from blast generated overpressure. As an example, at a distance of one mile from a one megaton air-burst detonation, initial radiation would probably prove fatal to a large portion of persons in the area even if they were shielded by 24 inches of concrete. These same people would simultaneously be exposed to blast overpressures of from 50 to 60 psi. Thus, the specific level of risk from initial radiation is difficult to define since population at risk to lethal levels of initial radiation is at double jeopardy from blast overpressure.

a. Very High Direct Effects Risk

(1) Definition - A Very High Direct Effects Risk Area is defined as the area surrounding a target aim point which has the potential to experience blast overpressures equal to or greater than 10.0 pounds per square inch (psi) from a nuclear weapon detonation.

(2) Criteria - In a Very High Direct Effects Risk Area death or severe injury from blast overpressure is certain without specially constructed protection against the blast wave and initial radiation. Survivors in this area might also face probably fatal fires generated by the thermal pulse of the weapon as well as damage-caused ignitions from ruptured gas and electric lines. This 10.0 psi limit marks the approximate median (50-50) point of lethal overpressure for persons inside homes as well as the threshold (beginning point) of possible lung damage. Beyond this demarcation, probable death and severe injury increase as overpressures increase exponentially toward the point of detonation.

While blast effects could be mitigated through specially constructed blast shelter, shelter occupants would also require protection from highly debilitating if not lethal levels of ionized radiation (neutrons and gamma rays) produced at the instant of the detonation of weapon. This initial radiation is extremely more difficult to protect against than fallout radiation produced by the fission reaction of the weapon.

In short, potential Very High Direct Effects Risk Areas are extremely dangerous for the continued protection and maintenance of human life.

(3) Overview - The total potential Very High Direct Effects Risk Areas in the U.S. cover approximately 46,352 square miles, with a resident population of 47.25 millions. Of the total U.S. area and population defined by NAPB-90 at risk from direct effects, 1.3 percent of the land area and 27.0 percent of the population fall under this risk definition. As a population group, those in potential Very High Direct Effects Risk Areas represent 19.6 percent of the total population of the U.S.

b. High Direct Effects Risk

(1) Definition - A High Direct Effects Risk Area is defined as the area around a target aim point which has the potential to experience

blast overpressures from a nuclear weapon detonation of equal to or greater than 5.0 psi but less than 10.0 psi.

(2) Criteria - A High Direct Effects Risk Area is a distinctly hazardous nuclear effects environment. Within this area lies the demarcation point of the median (50/50) probability of injury to persons within homes (approximately 7.0 psi). This is illustrative of the need for population protection measures of a prodigious nature in this area (measures which may still prove to be insufficient and impractical). Depending upon the type of construction, a large majority of homes within this area could be severely damaged or totally destroyed. Continued habitation in the area --even if survival of the initial blast overpressures were attained--would probably be impractical.

(3) Overview - The total potential High Direct Effects Risk Areas in the U.S. cover approximately 49,896 square miles with a resident population of 32.19 millions. Of the total U.S. area and population defined by NAPB-90 at risk from direct effects, 1.4 percent of the land area and 18.4 percent of the population fall under this threat definition. As a population group, those in potential High Direct Effects Risk Areas represent 13.3 percent of the total population of the U.S.

c. Medium Direct Effects Risk

(1) Definition - A Medium Direct Effects Risk Area is defined as the area surrounding a target aim point which has the potential to experience blast overpressures from a nuclear detonation of equal to or greater than 2.0 psi but less than 5.0 psi.

(2) Criteria - Unprotected and poorly protected populations in a Medium Direct Effects Risk Area have a sure probability of becoming injured or killed from either the dangers created by the blast overpressure or from the thermal pulse of a weapon. The impact lethality threshold, or the overpressure at which death could result from a body thrown by the blast, occurs within this area at approximately 3.3 psi. At approximately 2.3 psi and up, the likelihood of skull fractures increases from the same phenomenon and shattered glass and other debris impelled by the blast can be very dangerous and potentially fatal.

This area poses a risk to populations due to direct structural damage of homes and buildings. Persons caught outdoors when the detonation occurs may receive potentially severe and possibly fatal burns from the thermal pulse of the weapon. Without a detailed analysis of the specific characteristics of each area in this risk category, it must be assumed that there is a very high potential for fires that could result from the thermal pulse of the weapon or from damage-caused ignitions (see C., below). Protective measures to mitigate the immediate effects within this area are possible but time consuming and complex. Depending on the type of construction, homes and other buildings in this area would suffer moderately high to severe damage and may not be repairable. Moreover, continued habitation of undamaged or repaired homes may prove difficult and impractical except for emergency reasons. Long-term preparations to sustain surviving populations may also

have to take into consideration the potential lack of water pressure or electricity, as well as the complete failure of other vital community services. Finally, if downwind from a ground-burst weapon, the risk from fallout radiation may exacerbate and override the direct effects risk in this area.

(3) Overview - The total potential Medium Direct Effects Risk Areas in the U.S. cover approximately 151,535 square miles, which have a resident population of 50.3 millions. Of the total U.S. area and population defined by NAPB-90 as at risk from direct effects, 4.3 percent of the land area and 28.7 percent of the population fall under this risk definition. As a population group, those in potential Medium Direct Effects Risk Areas represent 20.8 percent of the total population of the U.S.

d. Low Direct Effects Risk

(1) Definition - A Low Direct Effects Risk Area is defined as the area surrounding a target aim point which has the potential to experience blast overpressures from a nuclear detonation of equal to or greater than 0.5 psi but less than 2.0 psi.

(2) Criteria - Blast overpressures in a Low Direct Effects Risk Area are not lethal in themselves, but serious injury or death can occur from flying debris if protection measures are not taken. In addition, the thermal pulse of the weapon in this area could result in significant first and second degree burns on exposed skin. Damage to homes and other buildings could range from low to moderately high depending upon the type of construction but would, generally, be limited to repairable damage. Repair of the area for continued long-term habitation could be a serious problem. Small but controllable fires are possible through thermal pulse ignitions of curtains, furniture, and other light flammable substances in and about homes. If uncontrolled initially, however, fires in this area might become a significant risk.

If downwind from a ground-burst weapon, this area could, within a short period of time, receive a significant amount of fallout radiation requiring additional protective measures.

(3) Overview - The total potential Low Direct Effects Risk Areas in the U.S. cover approximately 479,329 square miles, which have a resident population of 45.37 millions. Of the total U.S. area and population defined by NAPB-90 as at risk from direct effects, 13.5 percent of the land area and 25.9 percent of the population fall under this risk definition. As a population group, those in potential Low Direct Effects Risk Areas represent 18.8 percent of the total population of the U.S.

B. Fallout Radiation Risk

1. General Overview - The risk to U.S. population from gamma radiation given off from fallout particles produced by ground burst nuclear weapons is vast and far-reaching. None of the continental U.S. land area can be considered categorically secure from this risk. The two types of fallout from

a ground burst detonation are "early" (within 24 hours of the detonation) and "delayed" (after 24 hours of the detonation). Approximately 80 percent of the total radioactivity generated by a ground-burst weapon will be in the form of early fallout, with the remaining 20 percent reaching earth in the form of delayed fallout hundreds or thousands of miles from the point of detonation of the weapon. Heavier radioactive particles constitute the bulk of early fallout and fall closer in to the detonation point, while smaller, lighter particles are carried downwind eventually to fall earthward as delayed fallout. Delayed fallout, therefore, can cause radioactive contamination far beyond the range of the direct effects of the weapon detonation producing it. Given seasonal changes in weather patterns plus unpredictable local occurrences such as rain and showers, fallout must be regarded as a potential risk to all U.S. land areas.

The risk derives from human exposure to the gamma and beta radiation emitted by the fallout particles. Of these two types of radiation, protection from gamma rays is the more difficult to achieve since it requires extensive shielding ("mass") to reduce the radiation.

Gamma radiation is measured in units of roentgen (R) energy. The risk to human health and life is the amount of such energy absorbed by the body over time, called the "total dose." In most cases, a very high percentage of the total dose received will occur within the first hours after fallout arrival. In assessing the degree of risk from fallout, the total dose accumulated during a 1-week period provides an efficient standard of measurement. Table B-1 shows this and other exposure criteria for estimating the risk to human life and health from gamma radiation exposure.

Table B-1. OUTCOMES OF EXPOSURE TO GAMMA RADIATION

<u>Persons Needing Medical Care</u>	<u>Accumulated R Dose Within:</u>		
	<u>One Week</u>	<u>One Month</u>	<u>Four Months</u>
NONE	150	200	300
SOME (5% may die)	250	350	500
MOST (50% may die)	450	600	---

NAPB-90 based threat assessments on the potential effect of fallout radiation on the resident population of an area over a period of 1 week following the deposition of fallout and on the efficacy of various levels of shelter protection to mitigate such exposure. While Table B-1 is useful as a guide for judging potential acute radiation penalties in a nuclear attack environment, longer term biological effects should also be considered. Using shelter offering the highest protection possible in any fallout area to limit exposure to the lowest possible level will reduce the risk of medical care for acute radiation sickness as well as the risk of longer term biological effects. In NAPB-90, assessments of longer term effects for additional survivor deaths from radiation-induced cancers as well as deaths in future progeny caused by genetic damage were calculated for a range of total exposures. These

assessments were based on the assumption that exposures in a post-shelter environment (beyond 1 week) were the same as the exposure in the first week, i.e., the 1-week shelter exposure was essentially doubled to account for exposures over the longer term from remaining lower level radiation.

Estimations of potential increases in cancer deaths due to radiation exposures were based on work done by Dr. Warren Sinclair, President of the National Council on Radiation Protection and Measurements. He calculated that the cancer deaths resulting from exposures to 100R or more (but less than lethal) would be 3 percent per 100 person-roentgen (a 100 person-roentgen exposure would result if each of 100 persons were exposed to 1 roentgen, or if 50 people were exposed to 2 roentgens each, etc.). To calculate the cancer deaths for lower exposure levels, it was assumed that the percentage would decrease linearly from 3 percent per 100 person-roentgen at 100R exposure to 1.25 percent per 100 person-roentgen at 1 R exposure. Table B-2 shows these and other calculations made for other exposure levels.

The basis for data on genetic damage affecting future generations was taken from a document written by Sir Edward Pochin, former President of the International Commission on Radiation Protection as well as the British representative on the United Nations Scientific Committee on the Effects of Atomic Radiation. Dr. Pochin estimated that the increase in future deaths due to genetic damage would be 0.35 percent for each 100 person-roentgen. Calculations for other exposure levels were made accordingly as shown on Table B-2.

TABLE B-2. CANCER AND GENETIC CONSEQUENCES OF ONE-WEEK RADIATION DOSES

One-Week Acute R Dose	Assumed Total R Dose	Percent Cancer Deaths	Percent Genetic Deaths
6R	12R	0.18	0.04
12R	24R	0.40	0.08
15R	30R	0.53	0.10
30R	60R	1.40	0.21
38R	76R	2.00	0.27
50R	100R	3.00	0.35
75R	150R	4.50	0.53
100R	200R	6.00	0.70
150R	300R	9.00	1.10
188R	376R	11.00	1.30
200R	400R	12.00	1.40
250R	500R	15.00	1.80
300R	600R	18.00	2.10
375R	750R	23.00	2.60
500R	1000R	30.00	3.50
600R	1200R	36.00	4.20

These calculations are reflected in tables illustrating the consequence of shelter use for each of the risk levels discussed below.

2. Extent of the Risk. Residual radiation comes from the radioactive by-products of a nuclear detonation. The radioactive elements created by the detonation are joined with materials scoured from the crater of a ground burst weapon to form "fallout particles" which give off gamma radiation (as well as other less harmful forms of radiation). The extent of the risk portrayed by NAPB-90 was determined by:

- The fission-fusion ratio of the weapon. In a nuclear detonation, over 300 different radioactive isotopes are formed by the atomic fission ("splitting") of the uranium or plutonium used in the weapon. Atomic fusion ("joining") actions within the weapon create no harmful radioactive substances. The amount of fission products produced by the weapon is a function of the percentage of the weapon yield which results from fission. The fission-fusion ratio of an NAPB-90 weapon was assumed, for planning purposes, to be a 50-50 ratio (although fission-fusion ratios higher and lower than 0.5 are possible).
- The amount of fallout produced. Each megaton of fission energy yield (equivalent to 1 million tons of TNT explosive force) produces about 125 pounds of radioactive by-products. At the same time, a surface burst weapon vaporizes and draws upward an enormous amount of surface material (weighing up to 500,000 tons depending upon the weapon yield). This vaporized material, as it cools, combines with the fission by-products of the explosion to form fallout particles. NAPB-90 fallout risk was determined by analysis of weapons employed in a ground-burst mode.
- The altitude at which the weapon is detonated. (See the discussion of this in Part 2.D., "Targeting Considerations"). Generally, the more the fireball of a surface-burst weapon makes contact with the ground, from merely touching the surface to below-ground detonations, the more ground material will be lofted and be available for combination with fission by-products to produce fallout particles. Weapons employed by NAPB-90 in this mode were also analyzed for contribution to the fallout risk.
- The distribution of fallout. The wind direction and speed in the layers of the atmosphere up to the height reached by the mushroom cloud determines the area coverage of fallout. The height of the cloud is a function of the heat generated by the weapon yield. For very large weapons the cloud could reach 15 to 20 miles in altitude. The cloud drifts away from the target in relation to the speed and direction of the winds in each atmospheric layer through which the cloud has risen. Distribution of the fallout particles to the ground is a function of wind speed and gravity. The heavier particles will fall first, while lighter particles may be carried hundreds or thousands of miles from the target area before returning to earth. (See 4., below, for a discussion of the methodology employed by NAPB-90 to determine the distribution of the fallout risk.)

- The decay rate of the radioactivity in fallout. Each of the radioactive substances produced by fission exhibits a continuous and regular decrease or decay in the amount of radiation it gives off over time. The rate of decay is expressed as the "half-life" of the element, or the amount of time necessary for its radiation intensity to be reduced by one-half the original intensity. Two fission by-products are illustrative: the half-life of radioactive iodine-131 is 8 days, while the half-life for radioactive strontium-90 is 28 years. NAPB-90 used a decay rate of radioactivity for the mix of fission by-products which is generally expressed as a ten-fold reduction in intensity for every seven-fold increment of time after detonation (e.g., the radiation intensity at some location on the ground 7 hours after detonation would be one-tenth as much as it was 1 hour after detonation if all the fallout had been deposited within the first hour).

3. Statistical Overview - NAPB-90 defined the total potential risk from fallout from its ground-burst weapons to encompass the entire U.S. land area. While it is recognized that specific nuclear attack scenarios and specific weather patterns will result in little or no fallout radiation in some land areas, NAPB-90 makes no attempt to predict such an outcome.

The magnitude of this potential risk is represented with maps and statistics in Annex B.

4. Methodology Employed - Predicting the potential distribution of delayed fallout is a difficult and uncertain task. NAPB-90 employed the GUISTO-DNAF-1 fallout model to determine potential distribution patterns. This model is efficient in determining potential fallout distribution patterns for the small-yield, ground-burst weapons (high kiloton to low megaton ranges), characteristic of weapons used in NAPB-90 (see Part 2.C., "Weapon Inventory Base"). The model incorporates wind speeds and directions ("wind shears") for various altitudes up to the height reached by the weapon's mushroom cloud, integrating all data necessary to estimate unidirectional downwind fallout distributions.

To calculate potential fallout distributions "most probable" winds for each month of the year were used. The wind patterns were developed by the U.S. Air Force Environmental Technical Applications Center following analysis of the period January 1977 through September 1981. Within this period, a specific day for each month was chosen which represented the most typical surface and upper air flow patterns, together with wind patterns for the day preceding and following the date chosen. These wind patterns are those which could most probably be expected to occur any day of a month barring unseasonal weather or future atmospheric changes to current weather patterns.

In addition to calculations described above, the results of a Defense Nuclear Agency study which assessed fallout shelter protection factors was incorporated. This study used a simulated U.S. attack with ground-burst weapons corresponding closely with the pattern used in NAPB-90. The study simulated fallout distribution using 40 randomly selected wind patterns from weather data over a 5-year period.

Both of these probable fallout distributions were used to determine the highest dose reading reached within each county unit in the U.S. This reading was recorded as the degree of potential risk for that county. The probability of the county receiving this dose over a 1-week period was not considered, but it can be said to range from "greater than zero" to 100 percent. The depicted potential risk areas in Annex B should, therefore, not be interpreted as a prediction of the fallout risk resulting from any nuclear attack. The distribution of actual fallout would be driven by weather conditions extant at the time of the attack.

As pointed out earlier, predicting potential fallout distribution is a difficult and uncertain task. Within the current state-of-the-art, there are distinct possibilities of a priori errors in calculations. In addition, there is the possibility of abherent, unseasonal weather patterns on any day of the year.

NAPB-90 defines four degrees of potential fallout risk. Each definition is determined by the degree of influence specific protection measures would have on mitigating human exposures to gamma radiation. In this context, the following considerations were examined to determine the degrees of potential fallout risk:

- The mitigation of a 1-week, unprotected^{1/} exposure in relation to the protection factor (PF)^{2/} afforded by various shelters; and
- The kind, degree, and utility of in-place or crisis-generated shelter necessary to permit continued life support in the area; and the cost, total effort, preparation time, and efficacy of such shelter.

Specific criteria used in choosing risk level demarcations are included in discussions of these areas.

a. Very High Fallout Risk

(1) Definition - A Very High Fallout Risk Area is defined as an area which has the potential to receive a 1-week unprotected radiation dose of equal to or greater than 15,000R (nominally up to 100,000R).

(2) Criteria - If the radiation levels identified as characterizing a Very High Fallout Risk Area should actually occur, death for the resident population without very high quality protection would be almost certain. Because such high quality shelter protection factors (PF's) would be

1/ Outdoor fallout doses were calculated with no consideration for natural reductions in that dose which could be provided by the environment such as nearby buildings, lakes, ponds, streams, and surface irregularities. Average dose reductions for many outside locations might easily be half or more of the NAPB-90 levels calculated.

2/ The protection factor (PF) of a shelter is an expression of the effectiveness of the mass or shielding provided by the structure to attenuate gamma radiation (e.g., in a PF 100 shelter, the dose rate of gamma radiation would be .01 of the outside dose rate).

needed, adequate protection in the area may be difficult, if not impossible, to find.

Chart B-3a and B-3b illustrate the consequences of selecting protection levels ranging from PF 5 through PF 500. It should be pointed out that exact radiation levels can never be determined for specific points within this area in advance of fallout arrival. Hence, a minimum PF level for the entire area cannot (and should not) be defined. Shelter with the highest PF possible should always be used in planning.

Chart B-3a. PROBABLE CONDITION OF MAJORITY OF SURVIVORS IN
VERY HIGH FALLOUT RISK AREAS*

Using Shelter Protection Factor	Potential In-Shelter One Week Dose Range	Medical Care Needed	Able to Work	Probable Death Rate	Comments
PF 5	3000R +				Deaths would probably occur in two weeks or less
PF 10	1500R +	Yes	No	100%	
PF 20	750R +				
PF 30	500R +	Yes	No**	More than 50%	Deaths would occur in about one month
PF 40	375R +				
PF 60	250R +	Yes	No**	Less than 50%	Deaths would occur in 30 to 60 days
PF 80	188R +				
PF 100	150R +	No	Yes	Less than 5%	Deaths would occur in 60 or more days
PF 200	75R +				
PF 500	30R +	No	Yes	None	No symptoms

* Based on the lowest potential doses; at the practical upper limit of this area (approximately 100,000R dose), only shelter with a PF of 2000 or more can mitigate against probable illness and death.

** Except during illness-free latent period.

Survivors in an area of this type face the possibility of continuing to mitigate the radiation risk beyond 1-week in order to sustain life and health. Outdoor radiation levels in this area may still be high enough at the end of 1-week to severely limit outdoor activity and may require frequent and continued stay within shelter to limit additional exposures through the end of the first month. This longer in-shelter period and limited time for outdoor activity would require advance preparations to sustain life (stocking of food, water, sanitation equipment, etc.).

Chart B-3b. POTENTIAL LONG-TERM EFFECTS ON SURVIVORS IN
VERY HIGH FALLOUT RISK AREAS*

Using Shelter Protection Factor	Potential In-Shelter One Week Dose Range	Additional Survivor Cancer Deaths	Additional Deaths From Genetic Damage in Future Generations
PF 5	3000R +	No survivors	
PF 10	1500R +		No progeny
PF 20	750R +		
PF 30	500R +	23 to 30%	2.6 to 3.5%
PF 40	375R +		
PF 60	250R +	15 to 23%	1.8 to 2.6%
PF 80	188R +		
PF 100	150R +	4.5 to 11%	.53 to 1.3%
PF 200	75R +		
PF 500	30R +	0 to 1.4%	0 to .21%

* Based on assumption that sheltered survivors receive an additional dose over the longer term equal to that received in shelter, i.e., double the shelter dose received in 1 week.

The very high PF ratings needed in this area are generally found only in buildings of massive construction, mines, caves, tunnels, and the like. These facilities would have to be prepared in advance for occupancy.

(3) Overview - The total potential Very High Fallout Risk Areas cover approximately 421,835 square miles of the U.S., with a resident population of 9.582 millions. This constitutes 12.1 percent of the total U.S. land area, and 4.2 percent of the national population.

b. High Fallout Risk

(1) Definition - A High Fallout Risk Area is defined as an area which has the potential to receive a 1-week total radiation dose of equal to or greater than 6,000R but less than 15,000R.

(2) Criteria - If the radiation levels that characterize a High Fallout Risk Area should occur, eventual death from radiation is almost certain for resident populations unless they find shelter with relatively high protection factors (PF's).

Charts B-4a and B-4b illustrate the consequences of selecting PF levels ranging from PF 5 through PF 500. It should be pointed out that exact radiation levels can never be determined for specific points within this area in advance of fallout arrival. Hence, a minimum PF level for the entire area cannot (and should not) be defined. Shelters with the highest PF possible should always be used in planning.

Chart B-4a. PROBABLE CONDITION OF MAJORITY OF SURVIVORS IN HIGH FALLOUT RISK AREAS*

Using Shelter Protection Factor	Potential In-Shelter One Week Dose Range	Medical Care Needed	Able to Work	Probable Death Rate	Comments
PF 5	1200R-3000R				Deaths would probably occur in two weeks or less
PF 10	600R-1500R	Yes	No	100%	
PF 20	300R-750R				
PF 30	200R-500R	Yes	No**	More than 50%	Deaths would occur in about one month
PF 40	150R-375R				
PF 60	100R-250R	Yes	No**	Less than 50%	Deaths would occur in 30 to 60 days
PF 80	75R-188R				
PF 100	60R-100R	No	Yes	Less than 5%	Deaths would occur in 60 or more days
PF 200	30R-75R				
PF 500	12R-30R	No	Yes	None	No symptoms

* Based on the highest potential doses; further mitigation of illustrated conditions would occur at lower dose ranges.

** Except during illness-free latent period.

Chart B-4b. POTENTIAL LONG-TERM EFFECTS ON SURVIVORS IN HIGH FALLOUT RISK AREAS*

Using Shelter Protection Factor	Potential In-Shelter One Week Dose Range	Additional Survivor Cancer Deaths	Additional Deaths From Genetic Damage in Future Generations
PF 5	1200R-3000R	No	
PF 10	600R-1500R	survivors	No progeny
PF 20	300R-750R		
PF 30	200R-500R	23 to 30%	2.6 to 3.5%
PF 40	150R-375R		
PF 60	100R-250R	15 to 23%	1.8 to 2.6%
PF 80	75R-188R		
PF 100	60R-100R	4.5 to 11%	.53 to 1.3%
PF 200	30R-75R		
PF 500	12R-30R	0 to 1.4%	0 to .21%

* Based on assumption that sheltered survivors receive an additional dose over the longer term equal to that received in shelter, i.e., double the shelter dose received in 1 week.

Survivors in areas of this type may face the possibility of continuing mitigation of the radiation risk beyond 1 week in order to sustain life and health. Outdoor radiation levels could be high enough at the end of 1 week to place a limit on time for outdoor activities and may require continued use of the shelter to limit additional exposures through the end of the first month. The longer in-shelter period which may be required in this area would mean advance preparations to sustain life (stocking of food, water, etc.) are a necessary measure.

(3) Overview - The total potential High Fallout Risk Areas cover approximately 614,508 square miles of the U.S., with a resident population of 48.712 millions. This constitutes 18.0 percent of the total U.S. land area, and 21.3 percent of the national population.

c. Medium Fallout Risk

(1) Definition - A Medium Fallout Risk Area is defined as an area which has the potential to receive a 1-week unprotected radiation dose of equal to or greater than 3,000R but less than 6,000R.

(2) Criteria - If the fallout levels that characterize a Medium Fallout Risk Area should actually occur, death or debilitating illness from radiation is certain for resident populations without adequate shelter. Charts B-5a and B-5b illustrate the consequences of selecting PF

Chart B-5a. PROBABLE CONDITION OF MAJORITY OF SURVIVORS IN MEDIUM FALLOUT RISK AREAS*

Using Shelter Protection Factor	Potential In-Shelter One Week Dose Range	Medical Care Needed	Able to Work	Probable Death Rate	Comments
PF 5	600R-1200R	Yes	No	100%	Deaths would occur in two weeks or less
PF 10	300R-600R	Yes	No**	More than 50%	Deaths would occur in about one month
PF 20	150R-300R	Yes	No**	Less than 50%	Deaths would occur in 30 to 60 days
PF 30	100R-200R			Less than 5%	
PF 40	75R-150R	No	Yes	than 5%	Deaths would occur in 60 or more days
PF 60	50R-100R				
PF 80	38R- 75R				
PF 100	30R-60R				
PF 200	15R-30R	No	Yes	None	No symptoms
PF 500	6R-12R				

* Based on the highest potential doses; further mitigation of illustrated conditions would occur at lower dose levels.

** Except during illness-free latent period.

levels ranging from PF 5 through PF 500. It should be pointed out that exact radiation levels can never be determined for specific points within this area in advance of fallout arrival. Hence, a minimum PF level for the entire cannot (and should not) be defined. Shelter with the highest PF possible should always be used in planning.

Chart B-5b. POTENTIAL LONG-TERM EFFECTS ON SURVIVORS IN MEDIUM FALLOUT RISK AREAS*

Using Shelter Protection Factor	Potential In-Shelter One Week Dose Range	Additional Survivor Cancer Deaths	Additional Deaths From Genetic Damage in Future Generations
PF 5	600R-1200R	No survivors	No progeny
PF 10	300R-600R	23 to 30%	2.6 to 3.5%
PF 20	150R-300R	15 to 23%	1.8 to 2.6%
PF 30	100R-200R		
PF 40	75R-150R	4.5 to 11%	.53 to 1.3%
PF 60	50R-100R		
PF 80	38R-75R		
PF 100	30R-60R		
PF 200	15R-30R	0 to 1.4%	0 to .21%
PF 500	6R-12R		

* Based on assumption that sheltered survivors receive an additional dose over the longer term equal to that received in shelter, i.e., double the shelter dose received in 1 week.

Survivors in this area may face the possibility of continuing to use shelters beyond 1 week in order to sustain life and health. Potential outdoor radiation levels may be moderately high enough at the end of 1 week to require careful area monitoring to limit additional exposure from outdoor activity. Continued use of shelter beyond 1 week following outdoor activity may also be required through the end of the first month and would require modest preparations to sustain life (stocking of food, water, etc.).

(3) Overview - The total potential Medium Fallout Risk Areas cover approximately 578,616 square miles of the U.S., with a resident population of 62.702 millions. This constitutes 16.9 percent of the total U.S. land area, and 27.4 percent of the national population.

d. Low Fallout Risk

(1) Definition - A Low Fallout Risk Area is defined as an area which has the potential to receive a 1-week unprotected radiation dose of less than 3,000R.

(2) Criteria - If the fallout levels that characterize a Low Fallout Risk Area should occur, debilitating illness and possible death are certain for resident populations without adequate shelter. Charts B-6a

and B-6b illustrate the consequences of selecting protection levels ranging from PF 5 through PF 500. It should be pointed out that exact radiation

Chart B-6a. PROBABLE CONDITION OF MAJORITY OF SURVIVORS IN LOW FALLOUT RISK AREAS*

Using Shelter Protection Factor	Potential In-Shelter One Week Dose Range	Medical Care Needed	Able to Work	Probable Death Rate	Comments
PF 5	600R or less	Yes	No**	More than 50%	Deaths would occur in about one month
PF 10	300R or less	Yes	No**	Less than 50%	Deaths would occur in 30 to 60 days
PF 20	150R or less			Less than	Deaths would occur in
PF 30	100R or less	No	Yes	5%	60 or more days
PF 40	75R or less			than	
PF 60	50R or less				
PF 80	38R or less				
PF 100	30R or less	No	Yes	None	No symptoms
PF 200	15R or less				
PF 500	6R or less				

* Based on the highest potential doses; further mitigation of illustrated conditions would occur at lower dose levels.

** Except during illness-free latent period.

Chart B-6b. POTENTIAL LONG-TERM EFFECTS ON SURVIVORS IN LOW FALLOUT RISK AREAS*

Using Shelter Protection Factor	Potential In-Shelter One Week Dose Range	Additional Survivor Cancer Deaths	Additional Deaths From Genetic Damage in Future Generations
PF 5	600R or less	23 to 30%	2.6 to 3.5%
PF 10	300R or less	15 to 23%	1.8 to 2.6%
PF 20	150R or less		
PF 30	100R or less	4.5 to 11%	.53 to 1.3%
PF 40	75R or less		
PF 60	50R or less		
PF 80	38R or less		
PF 100	30R or less	0 to 1.4%	0 to .21%
PF 200	15R or less		
PF 500	6R or less		

* Based on assumption that sheltered survivors receive an additional dose over the longer term equal to that received in shelter, i.e., double the shelter dose.

levels can never be determined for specific points within this area in advance of fallout arrival. Hence, a minimum PF level for the entire area cannot (and should not) be defined. Shelter with the highest PF possible should always be used in planning.

Continued use of shelter in this type of area beyond 1 week might not be necessary. As a precaution, however, unnecessary outdoor work should be avoided until all necessary radiological monitoring and decontamination has been completed.

(3) Overview - The total potential Low Fallout Risk Area covers approximately 1,803,733 square miles of the U.S., with a resident population of 107.867 millions. This constitutes 52.8 percent of the total U.S. land area, and 47.1 percent of the national population.

C. Thermal and Secondary Blast Fire Risk

1. General Overview - This risk accompanies the direct effects risk discussed in A., above. There are two principal causes of fire in direct effects risk areas: primary fires ignited directly by the thermal pulse or "heat flash" of a nuclear detonation; and secondary fires started by blast effects damage on electrical connections, gas lines, heating units, etc.

About 35 percent of the energy of an air-burst nuclear weapon is released as thermal energy or "heat flash." In weapon yields in hundreds of kilotons the duration of this period of energy radiation is very short (a flash of light) and the heat from the fireball is translated almost instantly to the surrounding area. In larger weapons (a megaton or greater) the fireball is slower in forming and is of somewhat longer duration. Therefore, in large weapons, the heat from the fireball is prolonged in areas of high overpressure but is proportionally less than the energy transmitted at low overpressure distances by the smaller-yield weapons. (Note: for determination of the fire risk, NAPB-90 assumed weapon yields characteristic of the 1985-1990 strategic inventories, i.e., weapons in the 500 kiloton to 1.5 megaton range.)

Thermal energy is measured in the number of calories per square centimeter (abbreviated "cal/cm²") delivered to exposed areas. A calorie is the amount of heat necessary to raise the temperature of 1 gram of water 1 degree Celsius. The rate at which the calories are transmitted over time is also an important aspect of ignition. For weapons characteristic of the NAPB-90 inventories, it was assumed that thermal energy of the explosion is delivered almost "instantaneously" to exposed areas, i.e., at a very high rate.

The extent of the thermal effect of a nuclear weapon is subject to natural variations in the atmospheric conditions as well as the shielding ("shadow") provided by adjacent buildings, trees, hills, and the like. Likewise, any windows facing away from the fireball would receive little or no thermal energy. In addition to shielding, atmospheric conditions (such as rain or fog) would markedly reduce the transmission of the thermal energy and, thus,

subsequent primary fire starts. Even minor shielding can have a mitigating effect on the amount of heat transmitted beyond the shielding: ordinary window glass and screens can reduce heat transmission into a room by as much as 20 percent or more.

Secondary fires may result from the disruption of building furnaces, gas lines, electric lines, and the like, and are independent of those influences mentioned above affecting the number of primary fire starts, since secondary fires are generated by damage and destruction from blast overpressure.

All NAPB-90 discussions in this section on the risk of potential primary and secondary fires are based on the assumption of a nuclear weapon detonated at its optimum height of burst to maximize the area covered by a blast overpressure of 10.0 psi or more, and under clear weather conditions which allow a visibility of 10 miles or more.

2. Composition of the Fire Risk - Factors influencing the magnitude of the fire risk are:

- The type of blast damage within the area;
- The number of primary and secondary fires originating (and not suppressed) within the area;
- The density of construction of the fire area, usually defined as the fraction of ground covered by buildings;
- The number of buildings within the area which are burning at the same time (usually expressed as a percentage of buildings);
- The amount of immediate fuel available to the fire;
- The weather conditions at the time of burning; and,
- The season of the year.

An example of the relationship of these factors is presented below. It must be stressed that such examples are illustrative of the potential fire risk and are based upon certain assumptions of the factors influencing the magnitude of the fire risk. Emergency planning requires an assessment of the actual values of the factors which influence the fire potential of tracts within a Direct Effects Area. A comprehensive assessment can be conducted only by fire professionals who have a working knowledge of the technology of fire and who can define the "real-world" fire risk to an area. Fire risk definitions in NAPB-90 are illustrative of the potential risk and are not predictive.

a. Origination

(1) Relationship to Overpressure - There is close relationship between the level of blast overpressures from air-burst weapons and the thermal energy received at any given overpressure. For example, the rationale

designating 2.0 psi overpressure limit as the practical limit of major thermal-induced primary fires is based on the fact that for most air-burst weapons, the 2.0 psi boundary coincides with a delivered thermal energy about 12.0 cal/cm²--approximately the level of energy at which nearly all exposed easily flammable substances would ignite. This relationship, however, does not hold true between low air-bursts and surface-bursts of the same weapon yield.

Although little research has been done at low overpressure ranges on levels of thermal energy transmission, it is almost certain that primary fire ignitions could occur within the entire area of 0.5 psi and greater overpressure.

The level of damage produced by certain blast overpressures can affect fire growth and spread. For example, damage from blast overpressures in the 2.0 to 5.0 psi range is generally characterized by damaged but standing buildings amid a debris field--conditions favoring the spread, growth, and severity of fire. On the other hand, blast overpressures above 5.0 psi tend to result in a large debris field within which fire spread and growth could be much slower, and the severity of fires could be less intense.

(2) Primary Fire Starts - For all easily flammable materials exposed ("unshielded") to the thermal flash, the possibility exists that a primary fire may start if the material:

- Receives sufficient calories per square centimeter at a sufficient rate (i.e., over a very short period of time);
- Is not extinguished by the following blast wave or by immediate fire suppression actions; and,
- Is collocated with other, "heavier" fuel to sustain the initial ignition.

Ignition of commonly found outdoor "trash"--such things as newspapers, cardboard cartons, dried leaves--will usually occur at relatively low thermal exposures (about 5 to 7 cal/cm²). By themselves, however, these fuels rarely can generate a sustained fire. Of much greater concern are ignitions of materials most commonly found indoors where a thermal ignition of things like curtains or drapes may spread to other material within the room. The risk from primary ignitions is highest when both the "tinder" with which to begin the fire, and substantial, heavier fuel with which to provide for continued fire growth are present. While weapon testing has indicated that this type of fire rarely occurred below 2.0 psi overpressure, primary ignitions cannot be categorically ruled out for this area.

Table C-1 shows extrapolated weapons test data on the estimated primary fire starts which might be expected to occur in exposed rooms from an air-burst, 1.0 megaton weapon on a clear day. Note that primary fire starts below 2.0 psi could occur but are considered the exception.

Table C-1. Estimated Primary Fire Starts Per 1000 Exposed Rooms

<u>Blast Overpressure</u>	<u>Fires in Commercial Buildings</u>	<u>Fires in Private Residences</u>
0.5 psi	Possible but Rare	Possible but Rare
1.0 psi	Probably None	Probably None
2.0 psi	Approximately 1%	Less than 1%
3.0 psi	Approximately 20%	Approximately 10%
5.0 psi	Approximately 38%	Approximately 21%

Some visual evidence suggested at Hiroshima and Nagasaki that the blast wave which followed thermal radiation may have extinguished some primary ignitions (although no firm proof was found to support this assumption). However, subsequent shock tunnel tests of room fires similar to primary ignitions seemed to suggest that some proportion of primary fires will be extinguished by the blast wave and it will slow, but not stop, fire growth.

(3) Secondary Ignitions - As stated earlier, the damage and destruction of the blast wave can create secondary fires from a variety of causes. At Hiroshima, for example, a great number of fires were caused by the overturning of hot charcoal cooking braziers commonly found in Japanese homes.

Secondary fires present a potential risk regardless of local weather conditions which might inhibit primary ignitions and could also be more extensive in the case of ground-burst weapons. Advance preparations (such as shutting off electrical power and gas supplies) could significantly reduce, but probably not eliminate, secondary fires.

Studies and research suggest that statistically in the area receiving 2.0 psi to 5.0 psi overpressure up to six significant secondary fire starts might be expected for every million square feet of building floor space. In a predominantly residential area, however, the number of such starts might be half as many. Theoretically, this assessment suggests an important functional relationship between the degree of blast damage and potential secondary fire starts.

b. Growth - As noted previously, there are a number of factors which influence fire growth. These are discussed below in illustrative applications of fire growth factors of various combinations. The potential growth of individual fires into large group or mass fires, as well as "firestorms," is also discussed. In the example presented, influences of weather and the season of the year on the growth and severity of fire are not factored.

(1) Area Density - Probably one of the most important factors influencing fire growth and severity is the amount of open space between construction in a given area. This is usually expressed as the percent of land area which is under roof (streets, parks, parking lots, yards, and the like, are considered open space). Suburban single family residential areas,

for example, typically are 20 percent or less "built up," while an inner city tenement district may be built up 50 percent or more.

Table C-2 shows illustrative area coverages for some types of construction.

Table C-2. Illustrative Area Coverage

<u>General Type of Area Construction</u>	<u>Illustrative Area Covered by Buildings^{1/}</u>
Tenement/Townhouse	10 to 50 percent
Industrial	20 to 40 percent
High Rise Commercial	20 to 40 percent
Public Use Buildings	20 to 40 percent
Apartments (Fire Resistant)	10 to 25 percent
Warehousing/Storage	10 to 25 percent
Industrial Park	Up to 25 percent
Single Homes (All Types)	Up to 20 percent

^{1/} Percent of square mile covered by roof

The less open space between burning buildings, the more likely that fires will spread to buildings not previously ignited. Spread is achieved by three means of energy transfer: convection, radiation, and firebrands.

- Convection raises the temperature of nearby combustibles by the contact of flame or hot gases and is most likely to occur when buildings are immediately adjacent or very close to each other, as in a highly built-up area.
- Radiation from a burning structure raises the temperature of nearby combustibles in a manner similar to the thermal radiation of the weapon but at a very much lower rate.
- Firebrands from a burning building when carried aloft by wind or hot air convection currents can cause ignitions in other buildings and in other combustible material (such as debris) over a wide, downwind area.

It is not known how fire spreads in large debris fields with little or no structures standing.

(2) Simultaneous Burning - Another important influence on the growth and severity of fires is the number of standing buildings burning at the same moment within the area. Usually this is expressed as the percentage of total buildings within a square mile which are burning simultaneously. The importance of this influence was demonstrated in World War II and subsequently verified by controlled fire experiments.

(3) Fuel Load - The fuel in a building is measured in pounds of combustible material per square foot of floor space. This figure would represent the combined fuel of a building and its contents. For example, the fuel load of the contents of a single family residence might average

about 3.5 pounds per square foot of floor, while the combined fuel load of both contents and building might be 10 to 20 pounds or more per square foot for each floor of the structure.

The heat of combustion of the fuel is measured in kilowatt hours per pound of fuel. Each pound of available, burned fuel can be expected to release about 2.3 kilowatt-hours of energy (although many synthetic substances have a higher potential for energy release).

Table C-3 shows illustrative ranges of fuel loading for various types of building construction.

Table C-3. Illustrative Ranges of Fuel Loading

<u>General Type of Area Construction</u>	<u>Illustrative Fuel Load Per Square Foot, Per Floor*</u>
Warehousing/Storage	20 to 80 pounds
High Rise Commercial	10 to 40 pounds
Tenement/Townhouse	10 to 30 pounds
Industrial	5 to 30 pounds
Industrial Park	10 to 30 pounds
Frame or Brick Single Homes	10 to 20 pounds
Public Use Buildings	5 to 10 pounds
Single Homes (Fire Resistant)	5 to 10 pounds
Apartments (Fire Resistant)	3 to 5 pounds

*Building and sum of contents

c. Severity - Predicting the severity of fires is an uncertain science despite extensive research on World War II mass fires which occurred in German and Japanese cities. Some of the very large mass fires called "firestorms" by a German journalist had characteristics which were new to previous fire experience. In broad qualitative terms, fire research and study of the firestorm events following attacks on Heilbronn, Hamburg, Dresden, and Darmstadt, Germany, show that a firestorm event is accompanied by:

- High-velocity, in-rushing winds at the periphery of the fire area;
- A well-developed convection or smoke column; and,
- Little spread beyond the area containing the initial, merged fires.

Research also indicated that large fires, including firestorm events, will not develop without adequate fuel within the area of initial fires, coupled with a very high rate of fuel consumption. Most importantly, the studies showed that the level of damage from high-explosive bombs used before incendiary bombs played a significant role in the formation of the firestorm. The damage environment created was conducive to the rapid burning which took place. Four basic criteria were determined to be present in the firestorm events listed above. In each of these events:

- The average fuel loading per square foot of the entire fire area was at least 8 pounds (buildings and their contents);
- At least half of the standing, damaged buildings within the area were burning simultaneously and vigorously within a short time following initial fire starts;
- Initial surface winds at the time of the attack were less than 8 miles per hour; and,
- The firestorm area was greater than 0.5 square miles.

Illustrative examples on severity given below will address all of these criteria except weather (which is assumed to be "ideal").

(1) Relationship to Overpressures - As stated earlier, there is a close relationship between blast overpressure levels and characteristics which seem to replicate the German firestorm experiences. But while mass fire experiments in the 1960's tended to confirm much of the criteria for a firestorm occurrence (particularly those dealing with fuel consumption and burn rate), it is not at all clear whether fires in a nuclear effects environment would develop in the same manner.

Weapon test data show that buildings within the 2.0 to 5.0 psi overpressure range of a nuclear weapon would generally be heavily damaged but standing. Portions of this blast area might include certain of the necessary requirements for the generation of a firestorm. On the other hand, damage in the area experiencing 5.0 psi and more overpressure would be more severe with few buildings remaining standing. This area could be expected to consist largely of rubble and debris from destroyed buildings and their contents. Here, the necessary criteria for mass fires or firestorms may not be present (which is not to say that fires could not occur).

(2) Burn Time - Fire can be said to have three burn stages--all related to time: initial ignition; vigorous burning, when a large amount of the fuel energy is expended; and residual burning, which consumes the remaining fuel. Of the three, vigorous burning is the most important in determining the severity of fires following a nuclear detonation since it usually occurs over a relatively shorter period of time than the growth and residual stages. While not totally adequate as a measure, the vigorous burn stage can be used to define a burn "rate" for comparative purposes.

Weapon tests as well as research have shown that the vigorous burn stage of a damaged but standing structure generally releases a higher proportion of the available energy than the vigorous burn stage of rubble or debris of the same fuel density.

Table C-4 shows illustrative vigorous burn rates for various types of area construction for both damaged and destroyed building modes.

Table C-4. Illustrative Vigorous Burn Rates

General Type of Area Construction	<u>Damaged Buildings</u> ^{1/}			<u>Rubble and Debris</u> ^{2/}		
	Over Time	Percent of Fuel	Burn Rate ^{3/}	Over Time	Percent of Fuel	Burn Rate ^{3/}
Frame or Brick Single Homes	20 min	70%	2.10	40 min	75%	1.13
Single Family (Fire Resistant)	20 min	70%	2.10	40 min	75%	1.13
Tenement/Townhouse	25 min	60%	1.44	50 min	70%	.84
Apartments (Fire Resistant)	25 min	60%	1.44	50 min	70%	.84
Warehousing/Storage	40 min	60%	.90	80 min	70%	.53
High Rise Commercial	40 min	60%	.90	80 min	70%	.53
Industrial	60 min	30%	.30	60 min	30%	.30
Industrial Park	60 min	30%	.30	60 min	30%	.30
Public Use Buildings	60 min	30%	.30	60 min	30%	.30

1/ Damage characteristic in Medium Direct Effects Risk Areas (2.0 to 5.0 psi).

2/ Damage characteristic in High and Very High Direct Effects Risk Areas (greater than 5.0 psi).

3/ Relative burn rate given by the fraction of the available energy released per hour of vigorous burn time.

(3) Potential Energy - Previous illustrations concerning area coverage of various types of construction and corresponding fuel loads gave high-low ranges for these figures. To simplify further discussion, potential energies will be determined using only the high ranges of illustrative figures previously shown. Potential energies will be calculated for both the areas identified in Table C-4., above.

The severity of mass fire is expressed in terms of the average energy output per hour of vigorous burn time measured in millions of kilowatts of energy per square mile of fire area.

Table C-5 shows illustrative energies for various types of construction. Note that to determine such potential energy, it is necessary to assume an average number of stories for buildings in each category of construction. Fire severity assessments for specific areas require estimates based on the composition of construction in these areas.

Table C-5. Illustrative kW Energy (Millions) in Construction

<u>General Type of Area Construction</u>	Ave <u>Sty</u> ^{1/}	Area <u>Cvrg</u> ^{2/}	Fuel <u>Load</u> ^{3/}	Millions <u>Sq Ft</u>	kW <u>Bldg</u>	Energy <u>Per: Sq Mile</u>
High Rise Commercial	6	40%	40 lbs	94 kW	564 kW	6263 kW
Tenement/Townhouse	3	50%	30 lbs	141 kW	423 kW	2936 kW
Warehousing/Storage	2	25%	80 lbs	117 kW	235 kW	2610 kW
Industrial	2	40%	30 lbs	240 kW	47 kW	1566 kW
Public Use Buildings	4	40%	10 lbs	8 kW	31 kW	1044 kW
Industrial Park	2	25%	30 lbs	15 kW	29 kW	979 kW
Frame or Brick Homes	1.5	20%	20 lbs	55 kW	55 kW	392 kW
Apartments (Fire Res)	3	25%	5 lbs	12 kW	35 kW	245 kW
Single Homes (Fire Res)	1.5	20%	10 lbs	27 kW	41 kW	190 kW

1/ Assumed average height (stories) of all buildings in the area.

2/ Highest illustrative square mile area coverage by roof.

3/ Highest illustrative per square foot fuel load for building and contents.

To obtain an average rate of kilowatt energy release per hour per square mile, the burn rate for each type of construction must be considered.

Carrying over data illustrated in Table C-5, Table C-6a illustrates the potential kilowatt energy in a Medium Direct Effects Risk Area (2.0 to 5.0 psi overpressure) assuming 100 percent of the damaged, standing buildings are burning simultaneously at a vigorous burn rate, an extremely unlikely situation.

Table C-6a. Illustrative Energy Release With All Buildings Burning in Medium Direct Effects Risk Area (2.0 to 5.0 psi)

<u>General Type of Area Construction</u>	<u>Millions of kW Potential Sq Mile Energy</u> ^{1/}	<u>Burn Rate</u>	<u>Millions of kW Energy Release Per Sq Mile</u> ^{2/}
High Rise Commercial	6263 kW	.90	5736 kW
Tenement/Townhouse	2936 kW	1.43	4198 kW
Warehousing/Storage	2610 kW	.90	2349 kW
Frame or Brick Single Homes	392 kW	2.12	831 kW
Industrial	1566 kW	.30	470 kW
Single Homes (Fire Resistant)	196 kW	2.12	416 kW
Apartments (Fire Resistant)	245 kW	1.43	350 kW
Public Use Buildings	1044 kW	.30	313 kW
Industrial Park	979 kW	.30	294 kW

1/ All buildings; data carried from Table C-5.

2/ Potential average rate of kW energy per square mile (in millions of kW) if all buildings in the area are in vigorous burn stage.

Table C-6b illustrates the same calculations of potential energy release in kilowatts in the High and Very High Direct Effects Risk Areas (greater than 5.0 psi overpressure) if 100 percent of the rubble and debris from this construction are burning simultaneously at a vigorous burn rate, again, an extremely unlikely situation.

Both Table C-6a and C-6b will serve as a base for determining the average kilowatt energy release for more realistic assumptions of the numbers of buildings in simultaneous, vigorous burn stages which will allow an assessment of the possibility of mass fire or firestorm events.

Table C-6b. Illustrative kW Energy With Simultaneous Rubble and Debris Burning in High and Very High Direct Effects Risk Area (greater than 5.0 psi)

<u>General Type of Area Rubble or Debris</u>	<u>Millions of kW Potential Sq Mile Energy^{1/}</u>	<u>Burn Rate</u>	<u>Millions of kW Energy Release Per Sq Mile^{2/}</u>
High Rise Commercial	6244 kW	.53	3309 kW
Tenement/Townhouse	2940 kW	.83	2440 kW
Warehousing/Storage	2604 kW	.53	1380 kW
Industrial	1568 kW	.30	470 kW
Frame or Brick Single Homes	392 kW	1.14	447 kW
Public Use Buildings	1036 kW	.30	311 kW
Industrial Park	980 kW	.30	294 kW
Single Family (Fire Resistant)	196 kW	1.14	223 kW
Apartments (Fire Resistant)	252 kW	.83	209 kW

1/ All rubble and debris from buildings.

2/ Potential average energy release in millions of kW per square mile if all rubble and debris from buildings are in vigorous burn stage.

(4) Mass Fire/Firestorm Potential - Analyses of World War II mass fires concluded that the severity of fires can be expressed as an average kilowatt energy release per square mile of fire area. Many such fires were classified as group fires since the area covered by the conflagration was characterized by isolated city blocks burning simultaneously and vigorously but not merging. Group fires of this kind were estimated to generate energy releases of from 25 to 300 million kilowatts. Included in this category were the fires which followed the atomic bomb attacks on Hiroshima and Nagasaki. While extremely dangerous to life, the severity of fires in both of these cities was less than that generated by conventional bombing in the Tokyo fire raids carried out some weeks before the dropping of the atomic bombs.

The chief factors involved in estimating potential fire severity have been covered before and will not be repeated here. An illustration of the effect of these factors is, however, pertinent. The Hamburg firestorm event provides an example case:

- The average fuel load of the area (including all buildings and contents and considering the density of construction) was estimated to be 70 pounds per square foot of fire area. At 2.3 kilowatt-hours per pound this translated into 163 potential kilowatt-hours per square foot or about 4567 million kilowatt-hours per square mile.
- It was estimated that about 45 percent of the buildings were in a vigorous burn stage simultaneously during the firestorm; therefore, about 2055 million kilowatt-hours were released per square mile of burn area.
- The firestorm lasted about three hours and, therefore, the hourly average release was about 676 million kilowatt-hours.

From the above, an estimate of the possibility of a firestorm would be a combination of contributing factors which could lead to an average energy release of at least 650 million kilowatt-hours or more per square mile. However, potential energy releases lower than this level have also been shown to be extremely dangerous. Estimates derived from large burn tests show that extreme life-threatening situations can develop from a combination of extremely high air temperatures, smoke and combustion-generated gases, and the rapid rise in carbon monoxide when the average energy release approaches 300 million kilowatt-hours per square mile. Fatality rates also increase sharply as this level is approached.

Table C-7a illustrates the changes in per square mile energy release rates when various percentages of buildings are burning simultaneously within the Medium Direct Effects Threat Area (2.0 to 5.0 psi). Likewise, Table C-7b illustrates the changes in per square mile energy release rates when various percentages of building rubble and debris are burning simultaneously within the High and Very High Direct Effects Threat Areas (greater than 5.0 psi).

Table C-7a. Illustrative Results of Simultaneous Burning in Medium Direct Effects Risk Area (2.0 to 5.0 psi)

<u>General Type of Area Construction</u>	Average Square Mile Rate of Energy Release (Millions of kW)			
	<u>50% Burning</u>	<u>40% Burning</u>	<u>30% Burning</u>	<u>20% Burning</u>
High Rise Commercial	2819 kW*	2255 kW*	1691 kW*	1127 kW*
Tenement/Townhouse	2099 kW*	1679 kW*	1259 kW*	840 kW*
Warehousing/Storage	1175 kW*	940 kW*	705 kW*	470 kW*
Frame or Brick Single Homes	416 kW**	332 kW**	249 kW	166 kW
Industrial	235 kW	188 kW	141 kW	94 kW
Single Family (Fire Resistant)	208 kW	166 kW	125 kW	83 kW
Apartments (Fire Resistant)	175 kW	140 kW	105 kW	70 kW
Public Use Buildings	157 kW	125 kW	94 kW	63 kW
Industrial Park	147 kW	118 kW	88 kW	59 kW

* Firestorm theoretically possible at this average energy release rate given all previous illustrative assumptions on fuel, coverage, average stories, and burn rate.

** Level of energy release would make area extremely dangerous for survivors.

Table C-7b. Illustrative Results of Simultaneous Burning in High and Very High Direct Effects Risk Areas (greater than 5.0 psi)

<u>General Type of Area Construction</u>	Average Square Mile Rate of Energy Release (Millions of kW)			
	<u>50% Burning</u>	<u>40% Burning</u>	<u>30% Burning</u>	<u>20% Burning</u>
High Rise Commercial	1644 kW*	1315 kW*	986 kW*	658 kW**
Tenement/Townhouse	1233 kW*	986 kW*	740 kW*	493 kW**
Warehousing/Storage	685 kW*	548 kW**	411 kW**	274 kW
Industrial	235 kW	188 kW	141 kW	94 kW
Frame or Brick Single Homes	221 kW	176 kW	132 kW	88 kW
Public Use Buildings	157 kW	125 kW	94 kW	63 kW
Industrial Park	147 kW	118 kW	88 kW	59 kW
Single Homes (Fire Resistant)	113 kW	90 kW	68 kW	45 kW
Apartments (Fire Resistant)	103 kW	82 kW	62 kW	41 kW

* A firestorm is theoretically possible at this energy release rate given all previous illustrative assumptions on fuel, coverage, average stories, and burn rate.

** The level of energy release would make this area extremely dangerous for survivors.

3. Statistical Overview of Risk - NAPB-90 defines the potential risk from fire following a nuclear explosion as the total area covered by blast overpressure, i.e., any area which has the potential to experience 0.5 pounds per square inch (psi) or more. This represents 727,112 square miles of U.S. territory with an estimated resident population of 175.11 millions.

The magnitude of this risk is represented in Annex A.

4. Methodology Employed - NAPB-90 defines three levels of potential risk from fire. Each definition is driven by the likely effects of the potential fire on the life and health of the resident population. In this context, the following considerations were used in determining the degrees of fire risk:

- The potential long-term severity of the threat to survivors within a blast-damaged area through entrapment in damaged or destroyed buildings by fires of whatever origin and of whatever severity; and,
- The kind, degree, and practicality of fire suppression actions.

It should be evident from prior discussions that there must be many factors present before mass fire or firestorm can result. If, in the entire area, such factors are not found to be present following a detailed fire assessment, the defined risks will be less severe than presented below.

The defined NAPB-90 fire risks, therefore, do not predict the severity or extent of the threat itself but do point out the potential for the risk to

occur if necessary factors in the entire area (or in portions of the area) support such a conclusion.

a. Very High Fire Risk

(1) Definition - A Very High Fire Risk Area is defined as the area corresponding to the High and Very High Direct Effects Risk Areas, i.e., the area which has the potential to experience blast overpressures from a nuclear detonation equal to or greater than 5.0 psi.

(2) Criteria - In a Very High Fire Risk Area survivors would probably face life-threatening fires generated by the thermal pulse of a weapon as well as damage-caused ignitions from ruptured gas and electric lines. In this area, it will be virtually impossible to initiate fire-fighting procedures because of rubble and debris, severed waterlines, damaged or destroyed firefighting equipment, and the like. For this reason--more than for the potential severity of fires--any survivors of blast effects face death unless evacuated from this area.

In short, residents in potential Very High Fire Risk Areas face extremely dangerous blast overpressures as well as the possibility of death from ensuing fires of whatever origin or severity.

(3) Overview - The total potential Very High Fire Risk Areas in the U.S. cover approximately 96,248 square miles, with a resident population of 79.44 millions. Of the total U.S. area and population defined by NAPB-90 as under fire risk, 2.7 percent of the land area and 45.4 percent of the population fall under this risk definition. As a population group, those in Very High Fire Risk Areas represent 42.9 percent of the total population of the U.S.

b. High Fire Risk

(1) Definition - A High Fire Risk Area is defined as the area corresponding to the Medium Direct Effects Risk Area, i.e., the area which has the potential to experience blast overpressures from a nuclear detonation equal to or greater than 2.0 psi but less than 5.0 psi.

(2) Criteria - A High Fire Risk Area has the potential to experience large fires following weapon detonation which could prove fatal to survivors unless they were evacuated. The potential for such fires to originate and develop depends on the number of structures and construction type within the area and their propensity to fire growth and spread. Should a detailed fire analysis of this area reveal such characteristics, large group fires and even firestorms are possible, posing the possibility of sure death for survivors unable to evacuate the area.

Initial and subsequent firefighting procedures for large fires in this area will be difficult, if not impossible, due to limited mobility imposed by rubble and debris, the potential lack of water, and damaged or destroyed

fire-fighting equipment. Self-help fire fighting of initial ignitions (from whatever cause) may be possible but extremely difficult.

(3) Overview - The total potential High Fire Risk Areas in the U.S. cover approximately 151,535 square miles, with a resident population of 50.3 million. Of the total U.S. area and population defined by NAPB-90 as under fire risk, 4.3 percent of the land area and 28.7 percent of the population fall under this risk definition. As a population group, those in High Fire Risk Areas represent 20.8 percent of the total population of the U.S.

c. Medium Fire Risk

(1) Definition - A Medium Fire Risk Area is defined as the area corresponding to the Low Direct Effects Risk Area, i.e., the area which has the potential to experience blast overpressures from a nuclear detonation equal to or greater than 0.5 psi but less than 2.0 psi.

(2) Criteria - The most probable cause of fire in a Medium Fire Risk Area will be from indoor primary ignitions caused by the thermal radiation of the weapon. These indoor ignitions, if unchecked, have the potential to grow into larger, more threatening fires. Secondary fires in this area are possible, but not very likely. Since protective measures in this area can be effective against blast overpressures, firefighting in this area is possible (if extensive preattack preparations and training have been accomplished), but shortages or lack of water for such purposes may prove a serious problem.

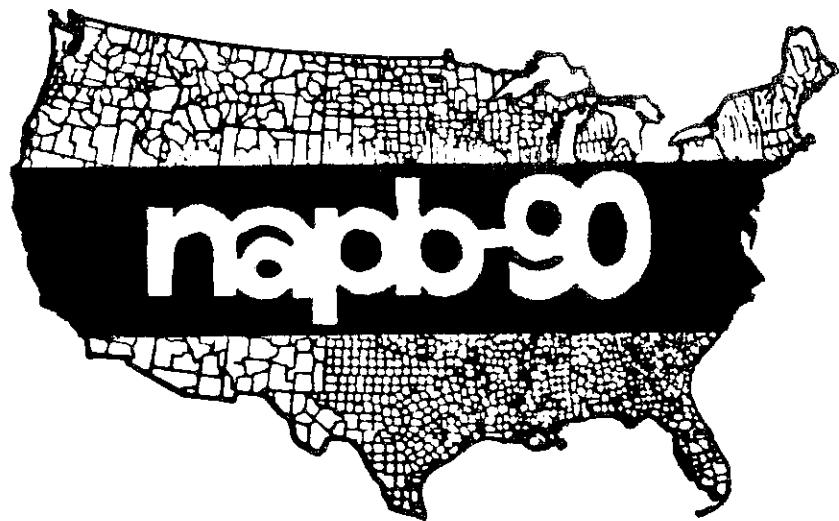
Fires in this area, even though individually intense, will probably not merge into a mass fire or firestorm.

(3) Overview - The total potential Medium Fire Risk Areas in the U.S. cover approximately 479,329 square miles, with a resident population of 45.37 millions. Of the total U.S. area and population defined by NAPB-90 as under fire risk, 13.5 percent of the land area and 25.9 percent of the population fall under this risk definition. As a population group, those in Medium Fire Risk Areas represent 18.8 percent of the total population of the U.S.

Nuclear Attack Planning Base-1990 Final Project Report

Annex A Direct Effects & Fire Risk Statistics & Maps

<https://fas.org/nuke/guide/usa/napb-90/>
<https://fas.org/nuke/guide/usa/napb-90/annexa.pdf>
(retrieved 22 June 2019)



A N N E X A - - D I R E C T E F F E C T S & F I R E R I S K

This Annex provides two summaries of the Direct Effects and Fire Risks to the U.S. resident population and land area.

PART 1. POPULATION GRID FILE (PGF) MAPS AND DATA

This part shows actual resident population and land area at risk from direct effects and fire as computed from PGF data. For a discussion of the methodology employed to obtain this data see Part 1, "Project Overview". This data is presented in regional summaries and computer-generated State map plots of PGF points showing blast overpressure and coexistent fire risk envelopes beginning on the pages following.

PART 2. HIGHEST DIRECT EFFECTS RISK BY COUNTY

This part, which begins on page A-81, shows county resident population and land area under direct effects risk based upon the highest recorded risk level within the county regardless of actual area covered by blast. This summary also includes counties which are "risk free", i.e., counties where blast overpressures were less than 0.5 psi.

A N N E X A - D I R E C T E F F E C T S & F I R E R I S K

PART 1. TABLE OF CONTENTS

NATIONAL Blast and Fire Risk Summary	A-	5
REGION I Blast and Fire Risk Summary	A-	7
Connecticut	A-	8
Maine	A-	9
Massachusetts	A-	10
New Hampshire	A-	11
Rhode Island	A-	12
Vermont	A-	13
REGION II Blast and Fire Risk Summary	A-	15
New Jersey	A-	16
New York	A-	17
Puerto Rico	A-	18
Territory of the Virgin Islands	A-	19
REGION III Blast and Fire Risk Summary	A-	21
Delaware	A-	22
District of Columbia	A-	23
Maryland	A-	24
Pennsylvania	A-	25
Virginia	A-	26
West Virginia	A-	27
REGION IV Blast and Fire Risk Summary	A-	29
Alabama	A-	30
Florida	A-	31
Georgia	A-	32
Kentucky	A-	33
Mississippi	A-	34
North Carolina	A-	35
South Carolina	A-	36
Tennessee	A-	37
REGION V Blast and Fire Risk Summary	A-	39
Illinois	A-	40
Indiana	A-	41
Michigan	A-	42
Minnesota	A-	43
Ohio	A-	44
Wisconsin	A-	45

PART 1. TABLE OF CONTENTS (Continued)

REGION VI Blast and Fire Risk Summary	A-	47
Arkansas	A-	48
Louisiana	A-	49
New Mexico	A-	50
Oklahoma	A-	51
Texas	A-	52
REGION VII Blast and Fire Risk Summary	A-	53
Iowa	A-	54
Kansas	A-	55
Missouri	A-	56
Nebraska	A-	57
REGION VIII Blast and Fire Risk Summary	A-	59
Colorado	A-	60
Montana	A-	61
North Dakota	A-	61
South Dakota	A-	63
Utah	A-	64
Wyoming	A-	65
REGION IX Blast and Fire Risk Summary	A-	67
Arizona	A-	68
California	A-	69
Hawaii	A-	70
Nevada	A-	71
American Samoa	A-	72
Guam	A-	73
Trust Territory	A-	74
REGION X Blast and Fire Risk Summary	A-	75
Alaska	A-	76
Idaho	A-	77
Oregon	A-	78
Washington	A-	79

NATIONAL DIRECT EFFECTS & FIRE RISK SUMMARY

REGION/DATA	TOTALS	HIGH			MEDIUM			LOW			NONE		
		GT 10 psi	5 to 10 psi	2 to 5 psi	GT 10 psi	5 to 10 psi	2 to 5 psi	GT 10 psi	5 to 2 psi	.5 to 2 psi	GT 5 psi	LT 5 psi	
I Population	12320207 (1.00)	2896912 (.23)	1597471 (.13)	2539876 (.21)	3085258 (.25)	2200690 (.18)							
Land Area	61682 (1.00)	1772 (.03)	1751 (.03)	4830 (.08)	14922 (.24)	38407 (.62)							
II Population	28524821 (1.00)	6216782 (.23)	5247384 (.18)	7174415 (.25)	5002208 (.18)	4684032 (.17)							
Land Area	58436 (1.00)	1931 (.03)	2418 (.04)	6496 (.11)	27594 (.47)	27594 (.47)							
III Population ...	25107876 (1.00)	5561771 (.22)	3826977 (.15)	5290161 (.21)	5591624 (.23)	4837343 (.19)							
Land Area ...	120550 (1.00)	4047 (.03)	4480 (.04)	14176 (.12)	41433 (.34)	56415 (.47)							
IV Population ...	42442705 (1.00)	5767158 (.16)	3985872 (.09)	6856991 (.16)	8190581 (.19)	17642103 (.42)							
Land Area ...	379046 (1.00)	4788 (.01)	6069 (.02)	21348 (.06)	83971 (.22)	262888 (.69)							
V Population ...	45687087 (1.00)	7118361 (.16)	5517272 (.12)	9692910 (.21)	9307723 (.20)	14050821 (.31)							
Land Area ...	323545 (1.00)	4465 (.01)	5512 (.02)	18219 (.06)	69267 (.21)	226082 (.70)							
VI Population ...	28140362 (1.00)	4692255 (.17)	3674256 (.13)	5871072 (.21)	5250122 (.19)	8652657 (.31)							
Land Area ...	548583 (1.00)	4703 (.01)	5348 (.01)	19637 (.04)	80016 (.15)	439536 (.80)							
VII Population ...	11925241 (1.00)	1818840 (.15)	1021635 (.09)	1827679 (.15)	1931387 (.16)	5325700 (.45)							
Land Area ...	282971 (1.00)	4671 (.02)	4713 (.02)	13463 (.05)	31919 (.11)	227857 (.81)							
VIII Population ...	7709731 (1.00)	1746086 (.23)	1061814 (.14)	1184503 (.15)	1143293 (.15)	2574035 (.33)							
Land Area ...	573497 (1.00)	14118 (.02)	14208 (.02)	34450 (.06)	60495 (.11)	450246 (.79)							
IX Population ...	31504342 (1.00)	9874143 (.31)	5447048 (.17)	8475761 (.27)	3917593 (.12)	3789797 (.09)							
Land Area ...	386970 (1.00)	4518 (.01)	3883 (.01)	13087 (.03)	50440 (.13)	323363 (.84)							
X Population ...	8634750 (1.00)	1553869 (.18)	808164 (.09)	1390051 (.16)	1949326 (.23)	933340 (.34)							
Land Area ...	815946 (1.00)	364 (xxx)	1514 (xxx)	5829 (.01)	26869 (.03)	780370 (.96)							

TOTAL Population : 242109419 (1.00) 47246177 (.20) 32187893 (.13) 50303419 (.21) 45369115 (.19) 66690518 (.27)
 Land Area .. 3551226 (1.00) 46352 (.01) 49896 (.01) 151535 (.04) 479329 (.13) 2832758 (.80)

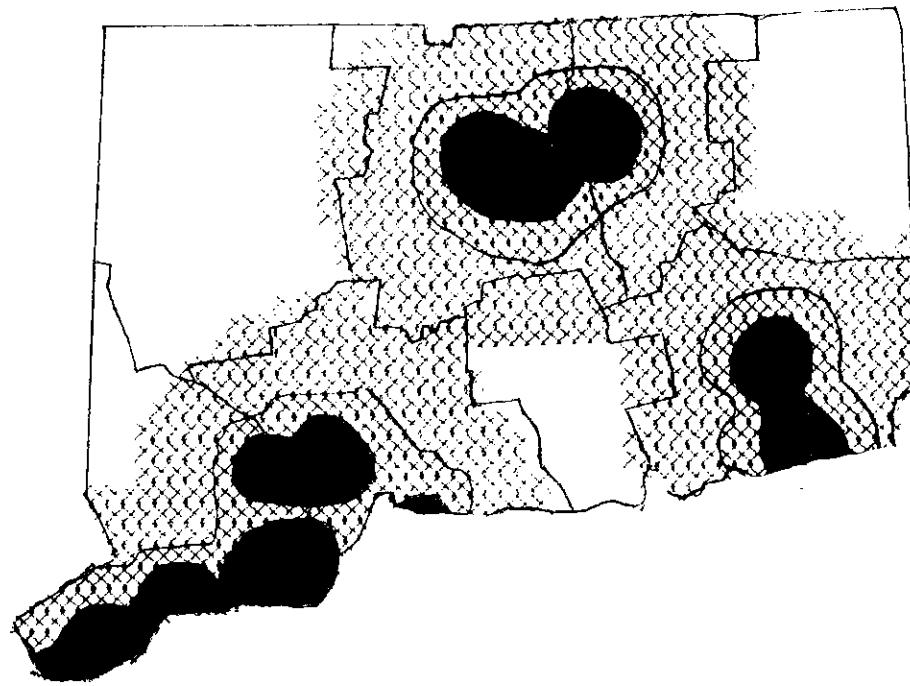
(xxx) Less than 1 percent

F E M A R E G I O N I - - D I R E C T E F F E C T S & F I R E R I S K

STATE/DATA		TOTALS	VERY HIGH	HIGH	MEDIUM	LOW	NONE
			GT 10 psi	5 to 10 psi	2 to 5 psi	.5 to 2 psi	LT .5 psi
CONNECTICUT	Population	3165461 (1.00)	699055 (.22)	385023 (.12)	1061179 (.33)	30981 (.01)	285635 (.09)
	Land Area	4872 (1.00)	439 (.09)	434 (.09)	1259 (.26)	2745 (.56)	-5 (N/A)*
MAINE	Population	1160878 (1.00)	147069 (.13)	60895 (.05)	123388 (.10)	284644 (.24)	544882 (.47)
	Land Area	30995 (1.00)	233 (.01)	307 (.01)	1068 (.03)	4602 (.15)	24785 (.80)
MASSACHUSETTS	Population	5503475 (1.00)	1695805 (.31)	919397 (.17)	1159268 (.21)	1231466 (.22)	497559 (.09)
	Land Area	6497 (1.00)	799 (.12)	661 (.10)	1603 (.25)	4332 (.67)	-898 (N/A)*
NEW HAMPSHIRE	Population	990437 (1.00)	123897 (.12)	86061 (.09)	162657 (.16)	203258 (.20)	414564 (.42)
	Land Area	8992 (1.00)	116 (.01)	164 (.02)	392 (.04)	1545 (.17)	6775 (.75)
RHODE ISLAND	Population	965471 (1.00)	208537 (.21)	186688 (.19)	362265 (.37)	259704 (.20)	----
	Land Area	1054 (1.00)	164 (.16)	164 (.16)	439 (.42)	287 (.27)	---- (.00)
VERMONT	Population	534485 (1.00)	22549 (.02)	27407 (.06)	28710 (.06)	45007 (.09)	410812 (.75)
	Land Area	9272 (1.00)	21 (xxx)	21 (xxx)	69 (.01)	545 (.06)	8616 (.93)
REGION I	Population	12320201 (1.00)	2896912 (.23)	1597471 (.13)	2539876 (.21)	3085258 (.25)	2200684 (.18)
	Land Area	61682 (1.00)	1772 (.03)	1751 (.03)	4830 (.08)	14922 (.24)	38047 (.62)

* [NOTE: Anomaly caused by State resource grid points overlapping the State boundaries.]

(xxx) Less than 1 percent



SCALE 1:1000000
ALBERS EQUAL AREA PROJECTION

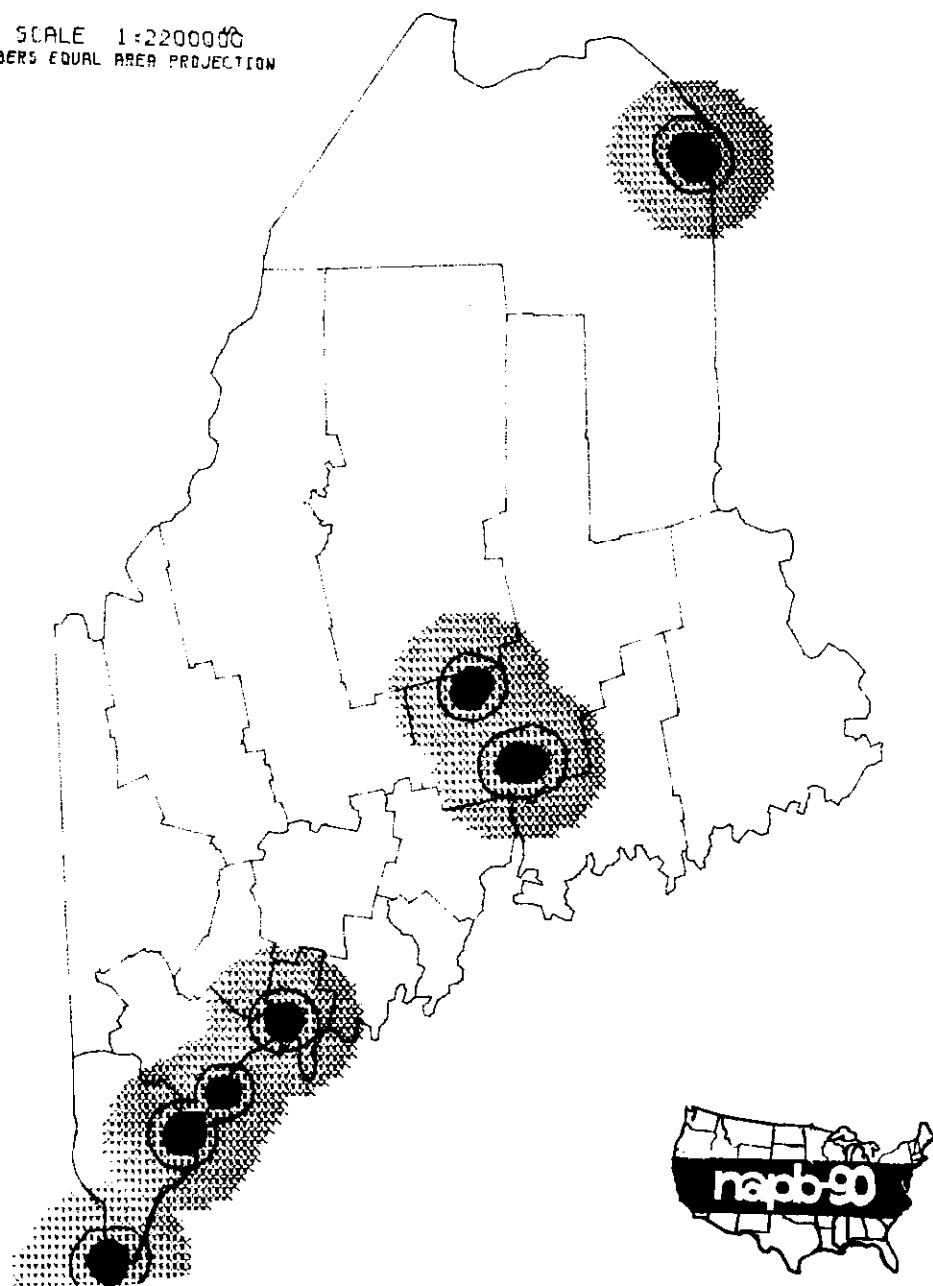


D I R E C T E F F E C T S R I S K A R E A S

FEMA REGION I - CONNECTICUT

- Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi

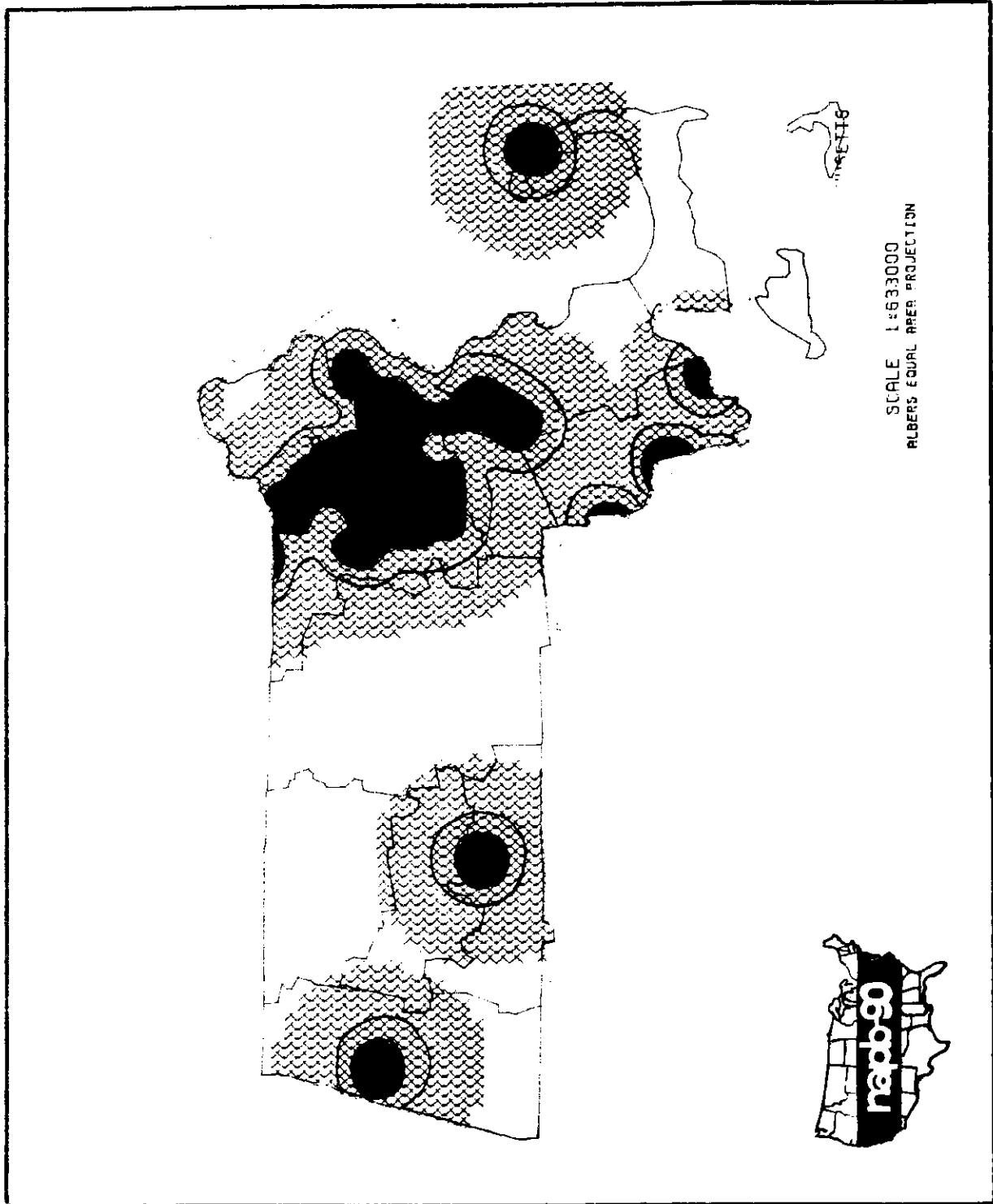
SCALE 1:2200000
ALBERS EQUAL AREA PROJECTION



DIRECT EFFECTS RISK AREAS

FEMA REGION I - STATE OF MAINE

- Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



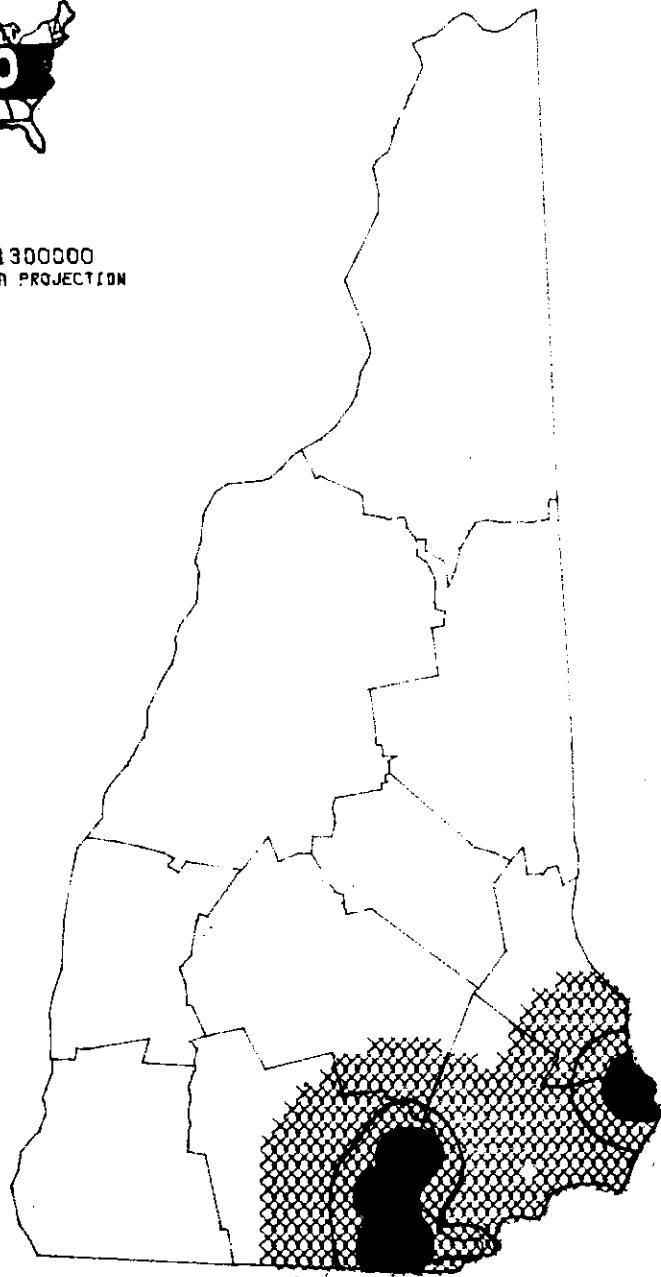
DIRECT EFFECTS RISK AREAS

FEMA REGION I - MASSACHUSETTS

Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



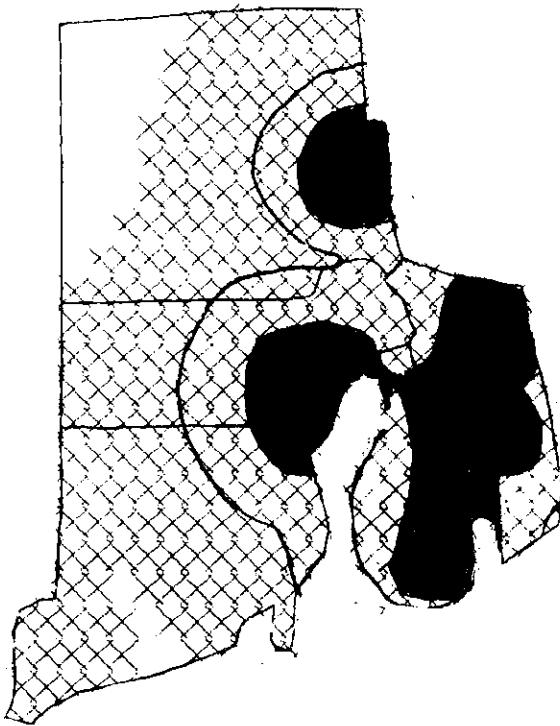
SCALE 1:1300000
ALBERS EQUAL AREA PROJECTION



DIRECT EFFECTS RISK AREAS

FEMA REGION I - STATE OF NEW HAMPSHIRE

- Black Area: Equal to or greater than 5.0 psi
- Ringed Area: Equal to or greater than 2.0 psi
- Unringed Area: Equal to or greater than 0.5 psi

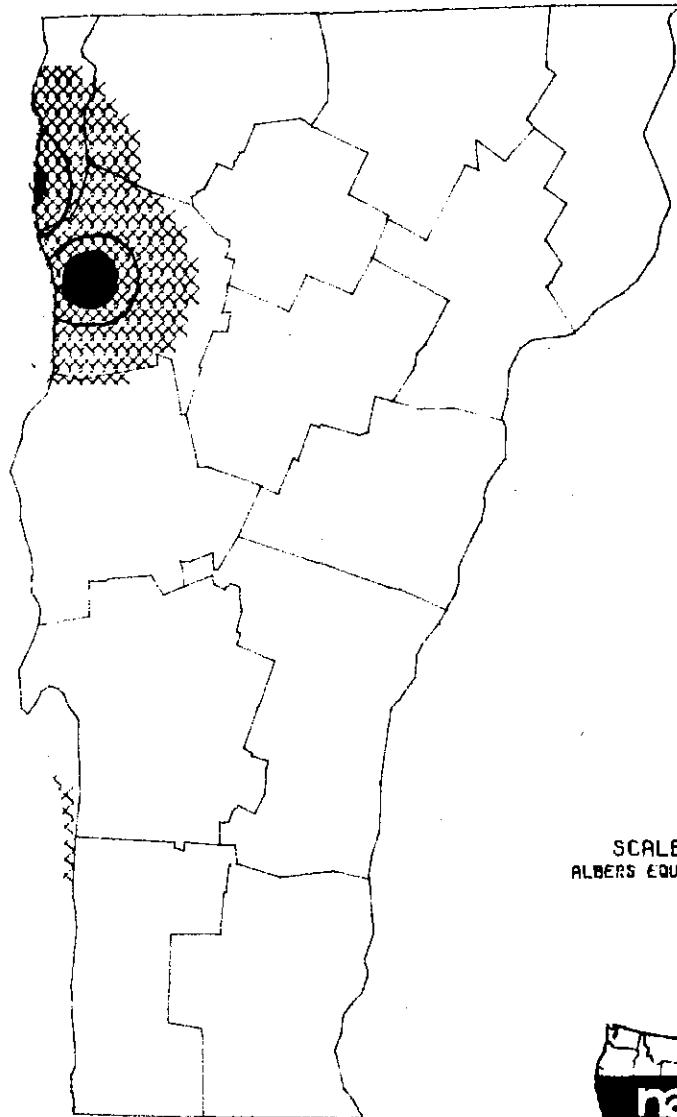


SCALE 1:1300000
ALBERS EQUAL AREA PROJECTION

D I R E C T E F F E C T S R I S K A R E A S

FEMA REGION I - RHODE ISLAND

- Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



SCALE 1:1300000
ALBERS EQUAL AREA PROJECTION



DIRECT EFFECTS RISK AREAS

FEMA REGION I - STATE OF VERMONT

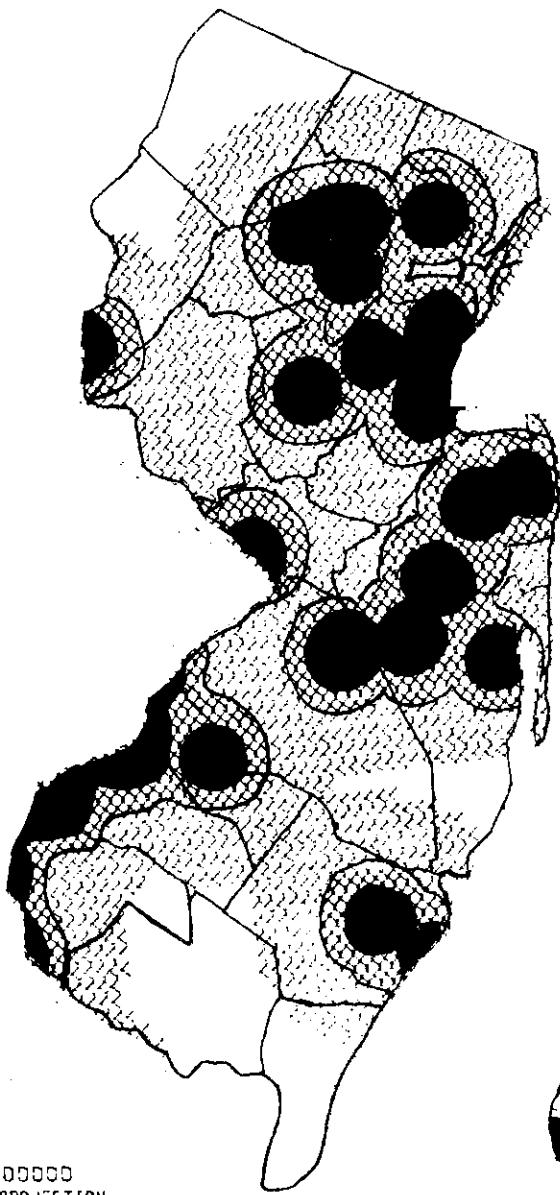
- Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi

F E M A R E G I O N I I - - D I R E C T E F F E C T & F I R E R I S K S

STATE/DATA	TOTALS	HIGH			MEDIUM			LOW			NONE LT .5 psi
		VERY HIGH GT 10 psi	HIGH 5 to 10 psi	5 to 10 psi	2 to 5 psi	.5 to 2 psi	LT .5 psi				
NEW JERSEY	Population Land Area	7551161 (1.00) 7468 (1.00)	1158926 (.15) 614 (.08)	1509143 (.20) 841 (.11)	2795018 (.37) 2264 (.30)	1792627 (.24) 4715 (.63)	95447 (.04) -970 (N/A)*				
NEW YORK	Population Land Area	17774143 (1.00) 43377 (1.00)	4999963 (.28) 1317 (.03)	3657085 (.21) 1577 (.04)	3932084 (.22) 4232 (.10)	2595023 (.15) 15282 (.35)	589988 (.14) 20969 (.48)				
PUERTO RICO	Population Land Area	3196520 (1.00) 3459 (1.00)	57893 (.02) ***	81156 (.03) ***	447313 (.14) ***	614558 (.19) ***	968600 (.63) ***				
VIRGIN ISLANDS	Population Land Area	104294 (1.00) 132 (1.00)	*** ***	*** ***	*** ***	*** ***	*** ***				
REGION II	Population Land Area	28324821 (1.00) 58436 (1.00)	6216782 (.22) 1931 (.03)	5247384 (.18) 2418 (.04)	7174415 (.25) 6496 (.11)	5002208 (.17) 19997 (.34)	684032 (.17) 27594 (.47)				

* [NOTE: Anomaly caused by State resource grid points overlapping the State boundaries.]

*** Data not available this printing



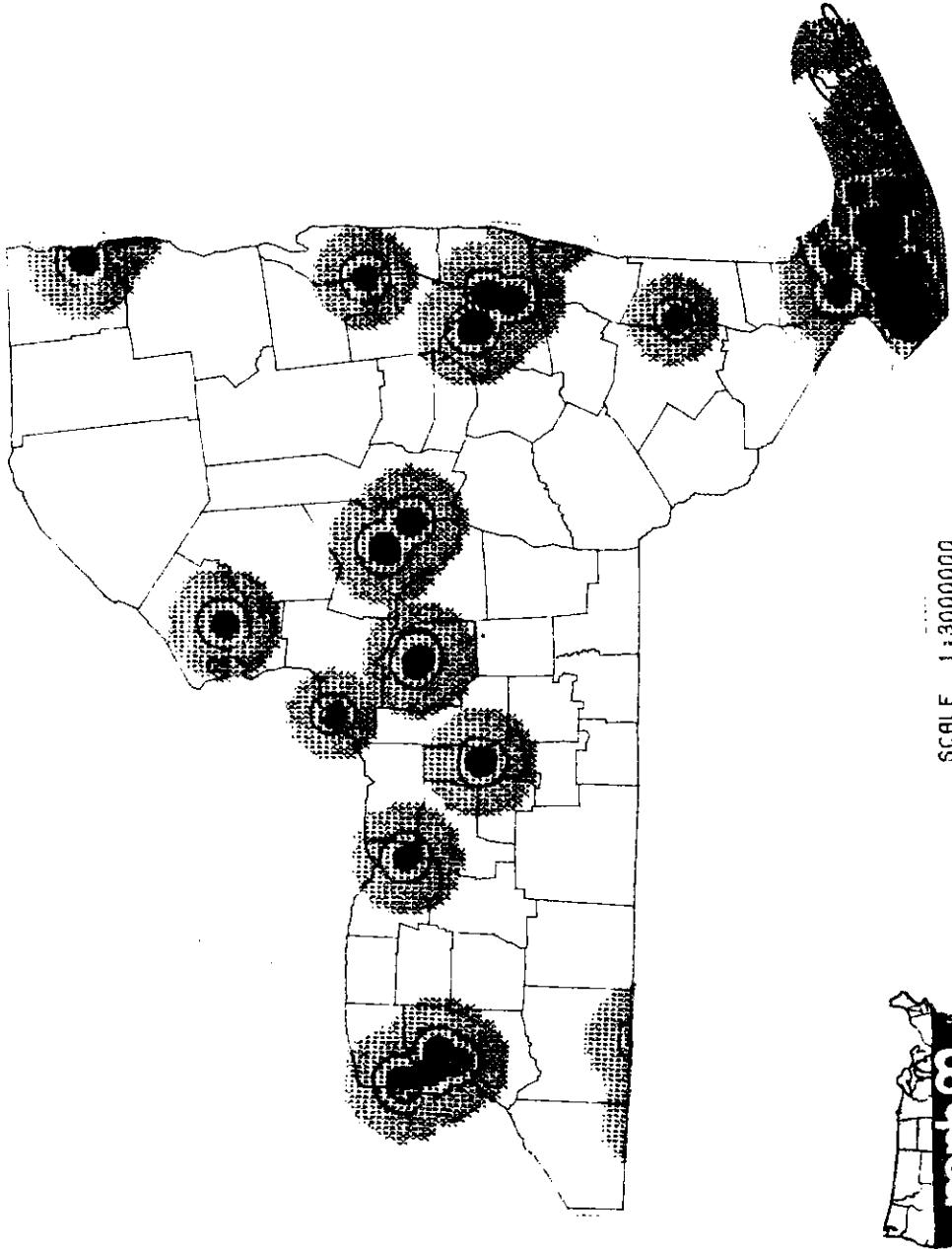
SCALE 1:1300000
ALBERS EQUAL AREA PROJECTION



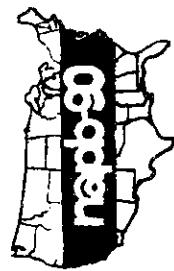
DIRECT EFFECTS RISK AREAS

FEMA REGION II - NEW JERSEY

- Black Area: Equal to or greater than 5.0 psi
- Ringed Area: Equal to or greater than 2.0 psi
- Unringed Area: Equal to or greater than 0.5 psi



SCALE 1:3,000,000
ALBERS EQUAL AREA PROJECTION



DIRECT EFFECTS RISK AREAS

FEMA REGION II - NEW YORK

- Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi

[MAP WILL BE FURNISHED SEPARATELY]

D I R E C T E F F E C T S R I S K A R E A S

FEMA REGION II - PUERTO RICO

- Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi

[MAP WILL BE FURNISHED SEPARATELY]

D I R E C T E F F E C T S R I S K A R E A S

FEMA REGION II - TERRITORY OF THE VIRGIN ISLANDS

Black Area: Equal to or greater than 5.0 psi

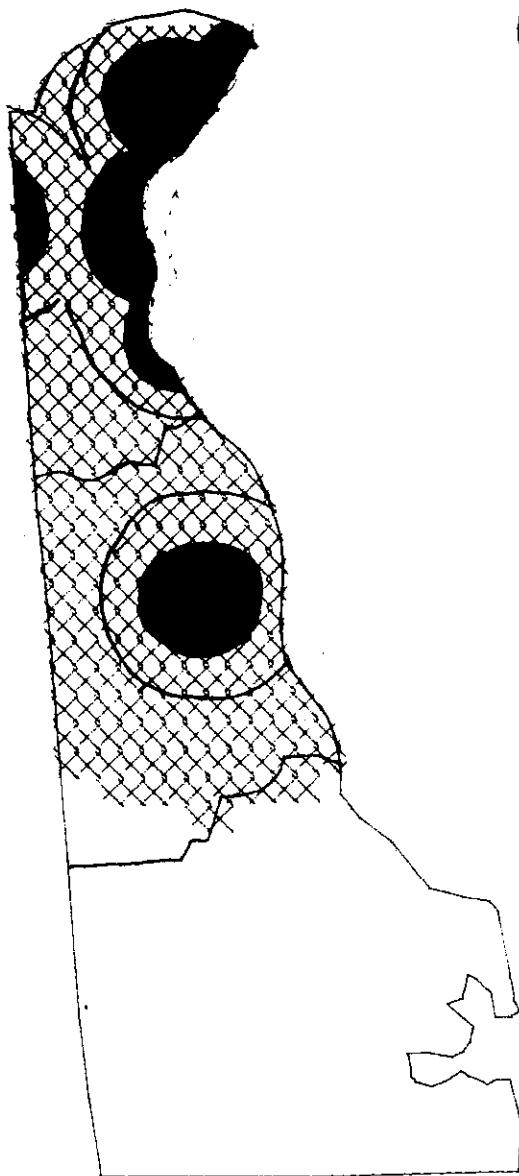
Ringed Area: Equal to or greater than 2.0 psi

Unringed Area: Equal to or greater than 0.5 psi

F E M A R E G I O N I I I - - D I R E C T E F F E C T S & F I R E R I S K S

STATE/DATA	TOTALS			HIGH GT 10 psi	MEDIUM 5 to 10 psi	LOW 2 to 5 psi	.5 to 2 psi	NONE LT .5 psi
	VERY HIGH GT 10 psi	HIGH 5 to 10 psi	MEDIUM 2 to 5 psi	.5 to 2 psi				
DIST OF COLUMBIA	Population	618906 (1.00)	379799 (.61)	182859 (.29)	56248 (.10)	---	(.00)	---
	Land Area	93 (1.00)	63 (.68)*	38 (.41)*	15 (.16)*	---	(.00)	---
DELAWARE	Population	530229 (1.00)	158757 (.30)	77026 (.15)	151013 (.28)	36073 (.08)	107360 (.19)	
	Land Area	1933 (1.00)	111 (.06)	175 (.09)	412 (.21)	688 (.36)	547 (.28)	
MARYLAND	Population	4381743 (1.00)	1084306 (.25)	843253 (.19)	1254439 (.29)	866103 (.20)	333642 (.08)	
	Land Area	9838 (1.00)	762 (.08)	820 (.08)	2391 (.24)	4810 (.49)	1057 (.11)	
PENNSYLVANIA	Population	11909083 (1.00)	2395327 (.20)	1870960 (.16)	2578836 (.22)	2908707 (.24)	2155253 (.18)	
	Land Area	44892 (1.00)	1566 (.03)	1888 (.04)	6020 (.13)	17246 (.38)	18172 (.40)	
VIRGINIA	Population	5715659 (1.00)	1358668 (.24)	765990 (.13)	976016 (.17)	1111036 (.19)	1503949 (.26)	
	Land Area	39700 (1.00)	1106 (.03)	1068 (.03)	3349 (.08)	11812 (.30)	22365 (.56)	
WEST VIRGINIA	Population	1952256 (1.00)	184914 (.09)	86709 (.05)	282609 (.14)	669705 (.34)	728319 (.38)	
	Land Area	24124 (1.00)	439 (.02)	492 (.02)	1989 (.08)	6877 (.29)	14372 (.60)	
REGION III	Population	25107876 (1.00)	5561771 (.22)	3826977 (.15)	5290161 (.21)	5591624 (.22)	4837343 (.19)	
	Land Area	120550 (1.00)	4047 (.03)	4480 (.04)	14176 (.12)	41433 (.34)	56415 (.47)	

* [NOTE: Anomaly caused by State resource grid points overlapping the State boundaries.]



SCALE 1:750000²
ALBERS EQUAL AREA PROJECTION

DIRECT EFFECTS RISK AREAS

FEMA REGION III - DELAWARE

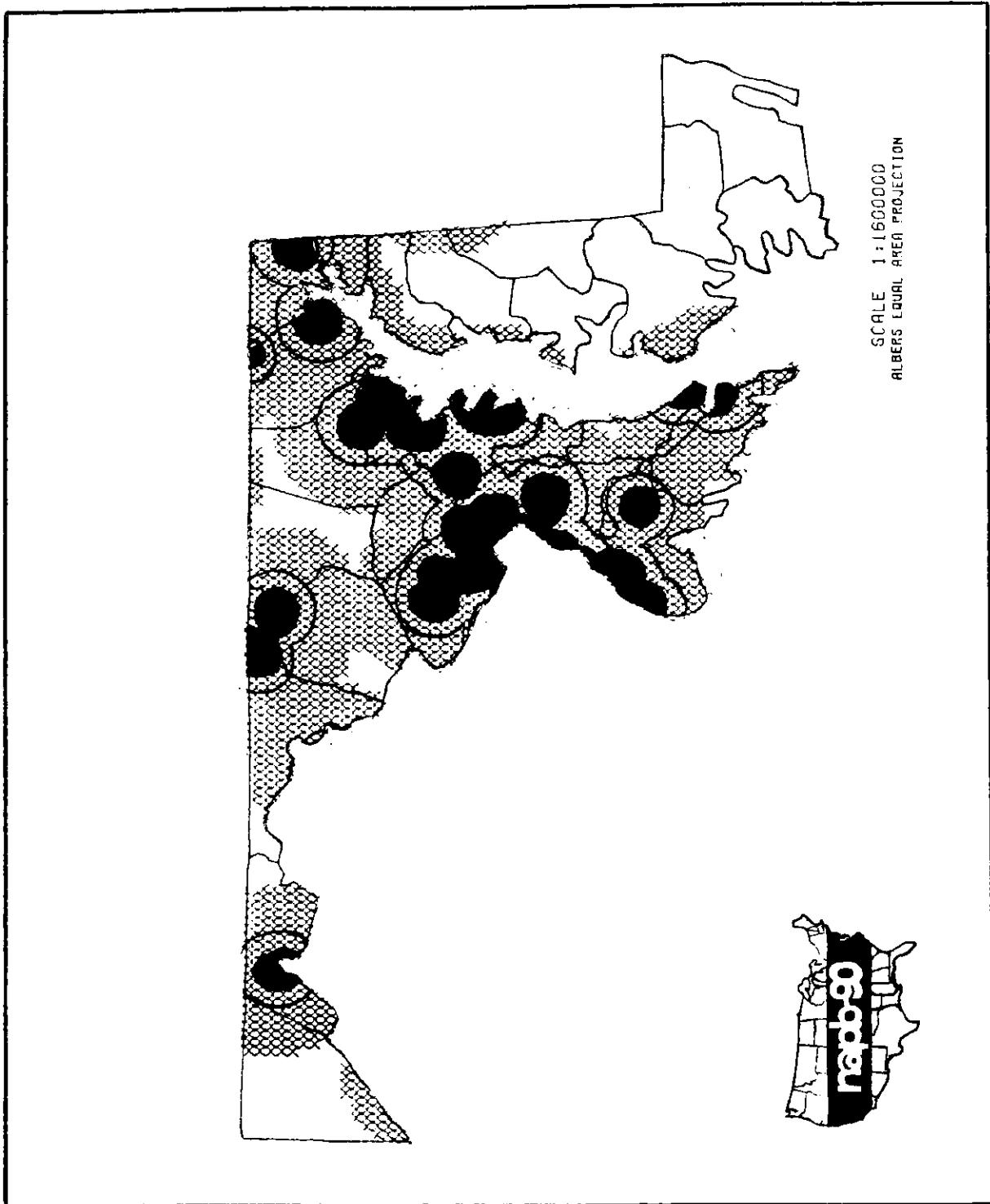
- Black Area: Equal to or greater than 5.0 psi
- Ringed Area: Equal to or greater than 2.0 psi
- Unringed Area: Equal to or greater than 0.5 psi

[MAP WILL BE FURNISHED SEPARATELY]

D I R E C T E F F E C T S R I S K A R E A S

FEMA REGION III - DISTRICT OF COLUMBIA AREA

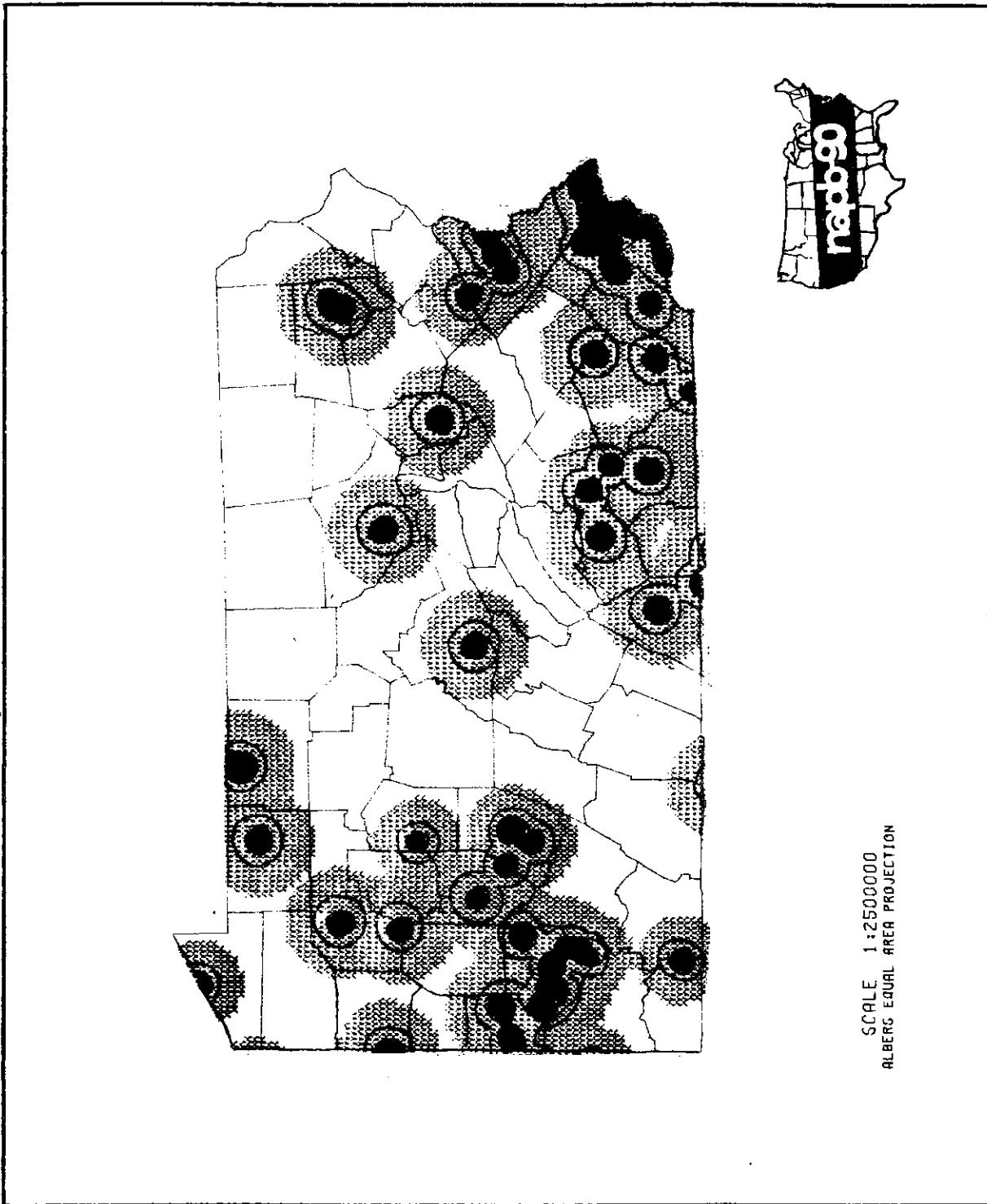
- Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



DIRECT EFFECTS RISK AREAS

FEMA REGION III - MARYLAND

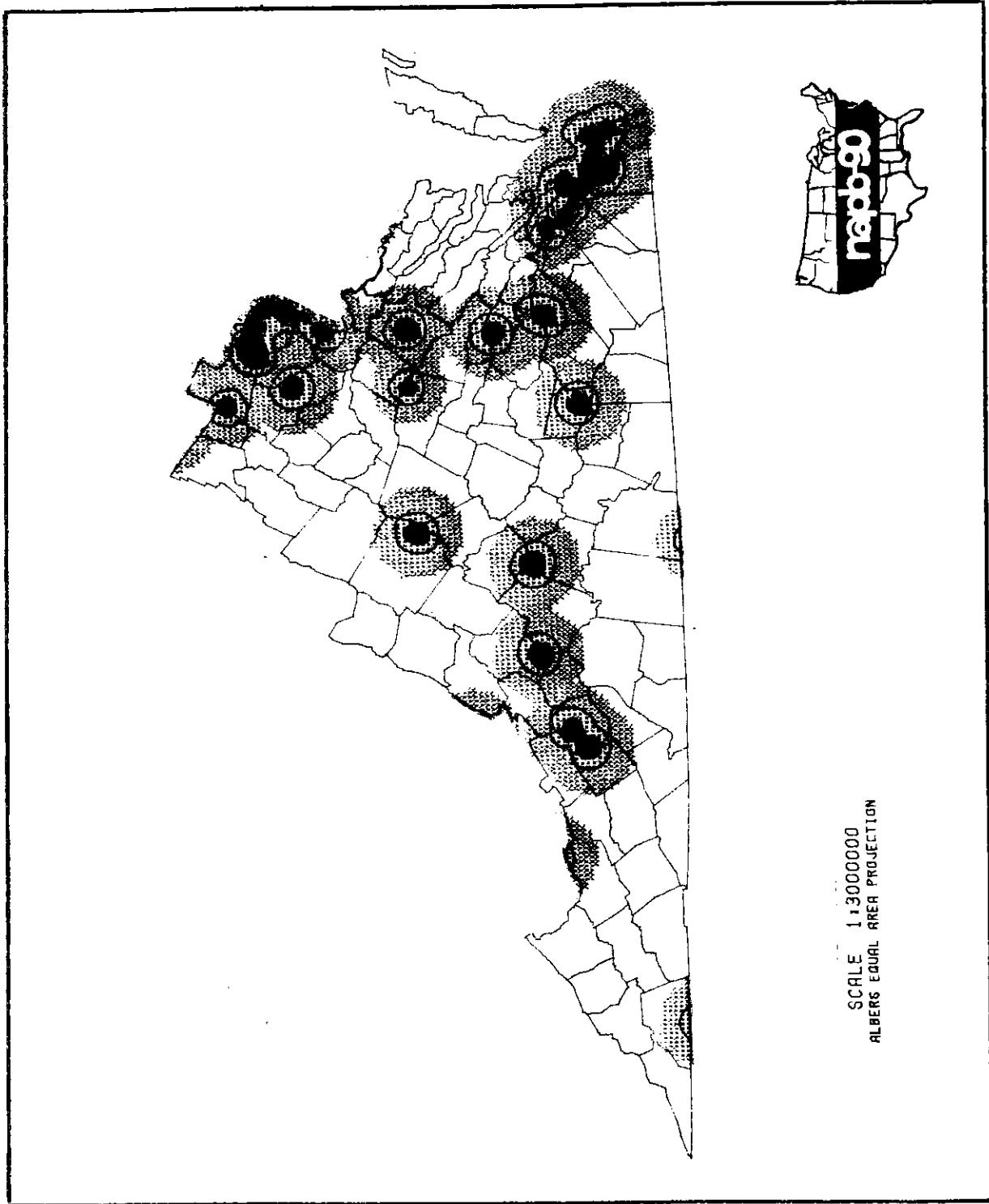
Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



D I R E C T E F F E C T S R I S K A R E A S

F E M A R E G I O N I I I - P E N N S Y L V A N I A

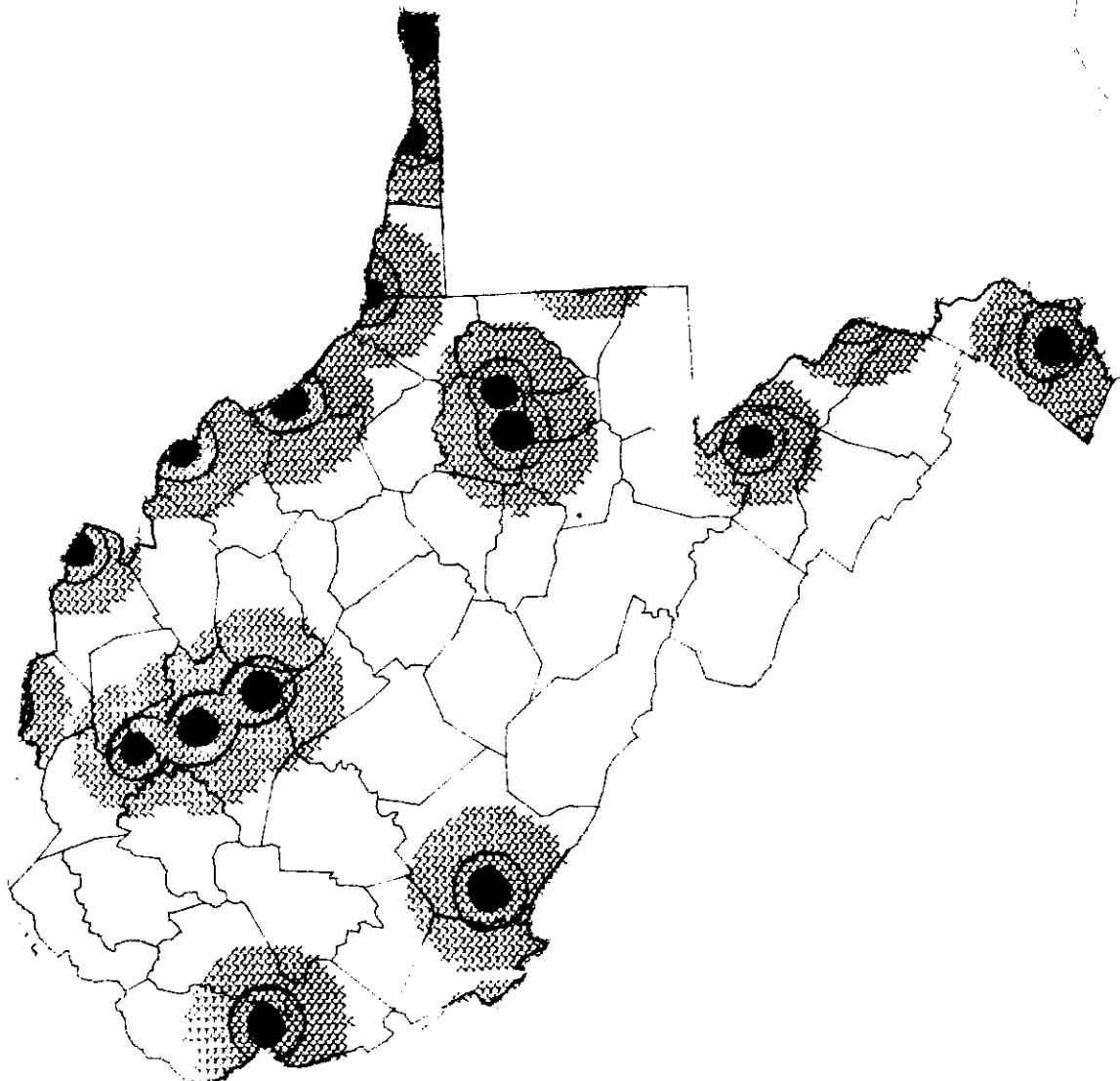
Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



DIRECT EFFECTS RISK AREAS

FEMA REGION III - VIRGINIA

Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



SCALE 1:2000000
ALBERS EQUAL AREA PROJECTION



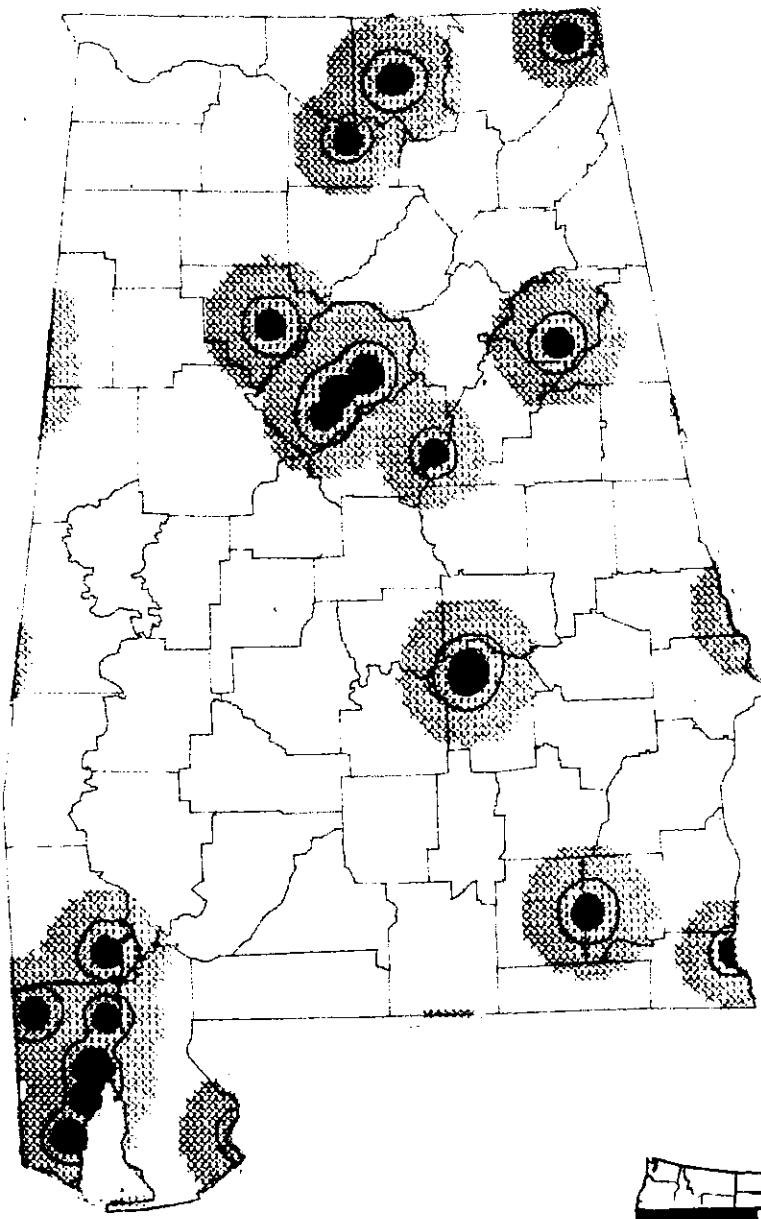
DIRECT EFFECTS RISK AREAS

FEMA REGION III - WEST VIRGINIA

- Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi

F E M A R E G I O N I V - - D I R E C T E F F E C T S & F I R E R I S K S

STATE/DATE		TOTALS	VERY HIGH GT 10 psi			HIGH 5 to 10 psi			MEDIUM 2 to 5 psi			LOW .5 to 2 psi			NONE LT .5 psi		
ALABAMA	Population	3959145 (1.00)	496537 (.13)	428603 (.11)	557090 (.14)	686281 (.17)	1790634 (.45)										
	Land Area	50739 (1.00)	523 (.01)	747 (.01)	2629 (.05)	14866 (.29)	31954 (.63)										
FLORIDA	Population	11883346 (1.00)	2457768 (.21)	1587622 (.13)	2485369 (.21)	2094563 (.18)	3258024 (.27)										
	Land Area	63397 (1.00)	1333 (.02)	1397 (.02)	5025 (.08)	17732 (.28)	37920 (.60)										
GEORGIA	Population	5929253 (1.00)	820023 (.14)	632291 (.11)	1312362 (.22)	1192531 (.20)	1972026 (.33)										
	Land Area	58117 (1.00)	746 (.01)	952 (.02)	3629 (.06)	12188 (.21)	40602 (.70)										
KENTUCKY	Population	3730146 (1.00)	403894 (.11)	289245 (.08)	448707 (.12)	905660 (.24)	1682640 (.45)										
	Land Area	39639 (1.00)	397 (.01)	566 (.01)	1862 (.05)	7940 (.20)	28874 (.73)										
MISSISSIPPI	Population	2617133 (1.00)	228224 (.09)	187546 (.07)	315988 (.12)	380394 (.15)	1504981 (.57)										
	Land Area	47174 (1.00)	413 (.01)	493 (.01)	1797 (.04)	7297 (.15)	37192 (.79)										
N. CAROLINA	Population	6233774 (1.00)	391174 (.06)	256164 (.04)	732968 (.12)	1251116 (.20)	3602352 (.58)										
	Land Area	48843 (1.00)	540 (.01)	597 (.01)	2439 (.05)	9469 (.19)	35789 (.73)										
S. CAROLINA	Population	3343422 (1.00)	341270 (.10)	245008 (.07)	356102 (.11)	649206 (.19)	1751836 (.52)										
	Land Area	30207 (1.00)	333 (.01)	519 (.02)	1724 (.06)	7078 (.23)	20553 (.68)										
TENNESSEE	Population	4746516 (1.00)	628268 (.13)	359393 (.08)	648405 (.14)	1030830 (.22)	2079620 (.44)										
	Land Area	40930 (1.00)	503 (.01)	798 (.02)	2243 (.05)	7390 (.18)	29996 (.73)										
REGION IV	Population	42442705 (1.00)	5767158 (.16)	3985872 (.09)	6856991 (.16)	8190581 (.19)	17642103 (.42)										
	Land Area	379046 (1.00)	4788 (.01)	6069 (.02)	21348 (.06)	83971 (.22)	262888 (.69)										



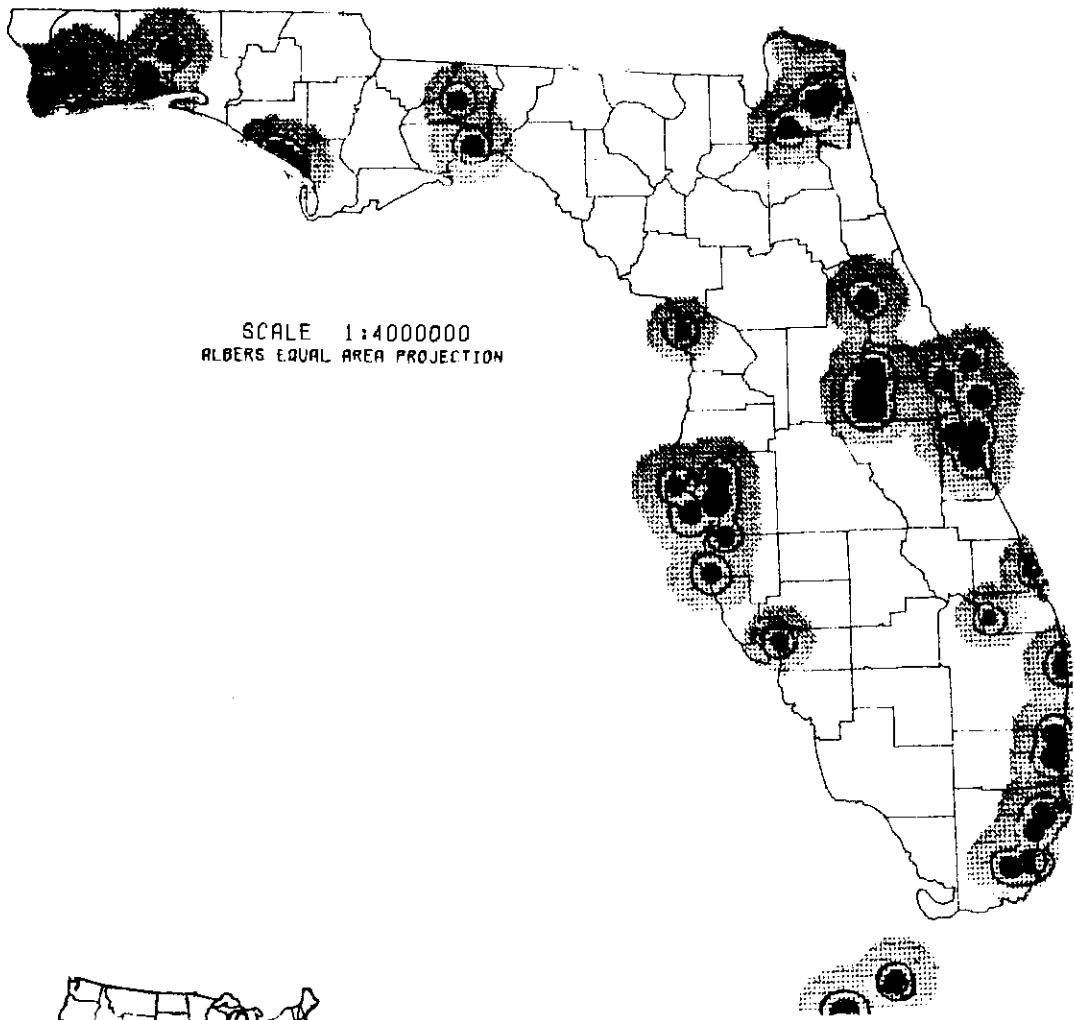
ALABAMA
SCALE 1:2500000
ALBERS EQUAL AREA PROJECTION



D I R E C T E F F E C T S R I S K A R E A S

F E M A R E G I O N I V - A L A B A M A

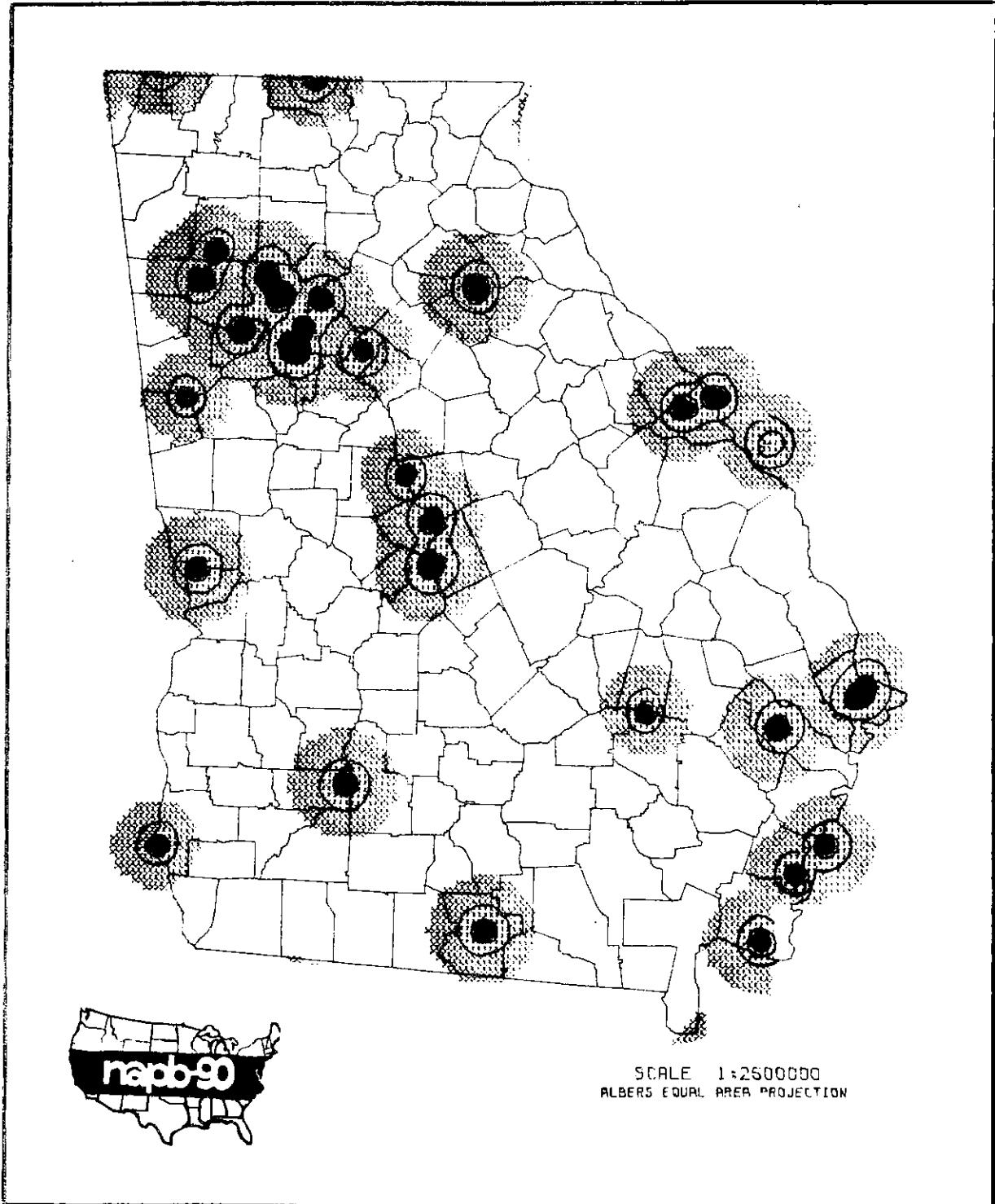
- Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



DIRECT EFFECTS RISK AREAS

FEMA REGION IV - FLORIDA.

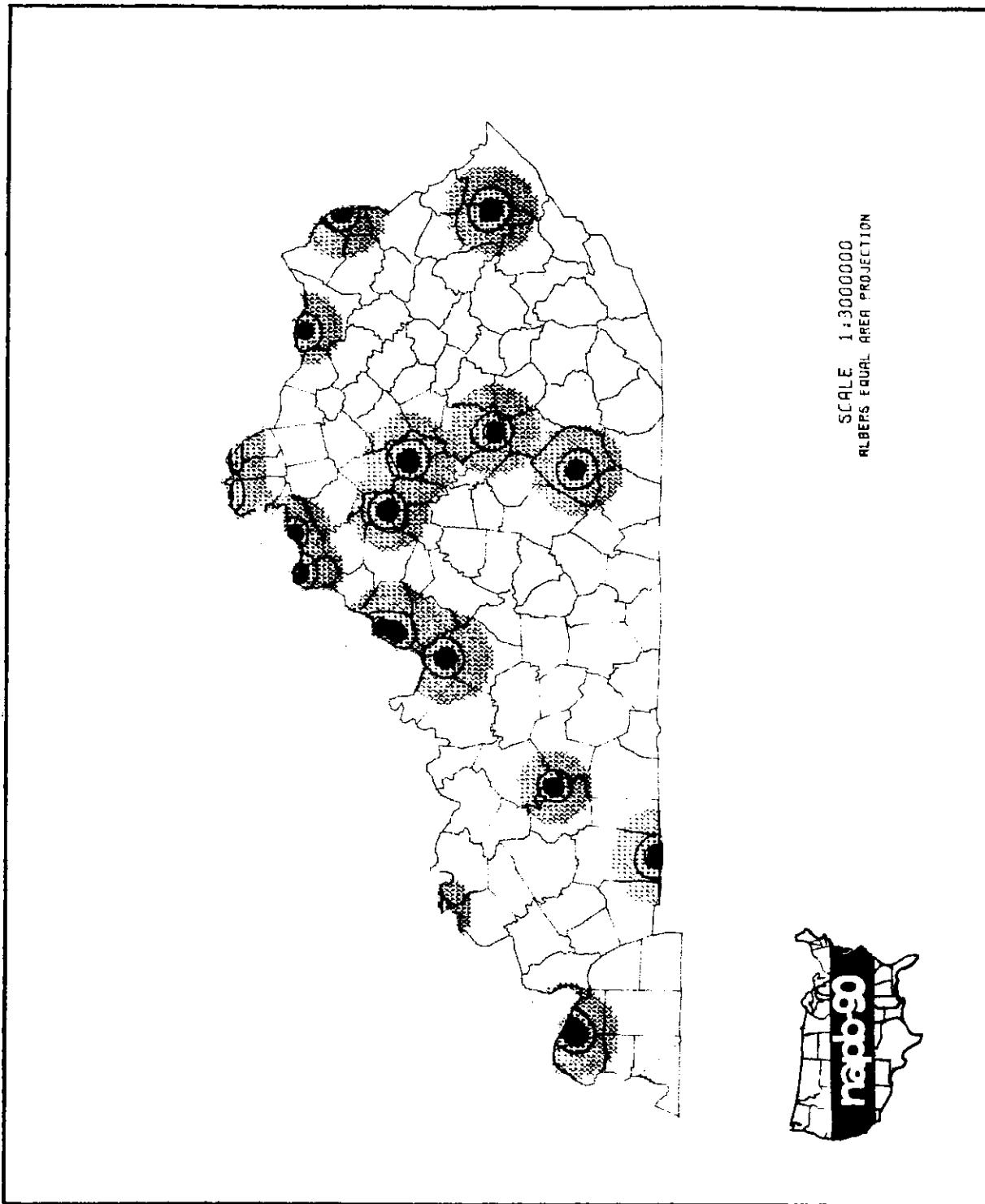
Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



DIRECT EFFECTS RISK AREAS

FEMA REGION IV - GEORGIA

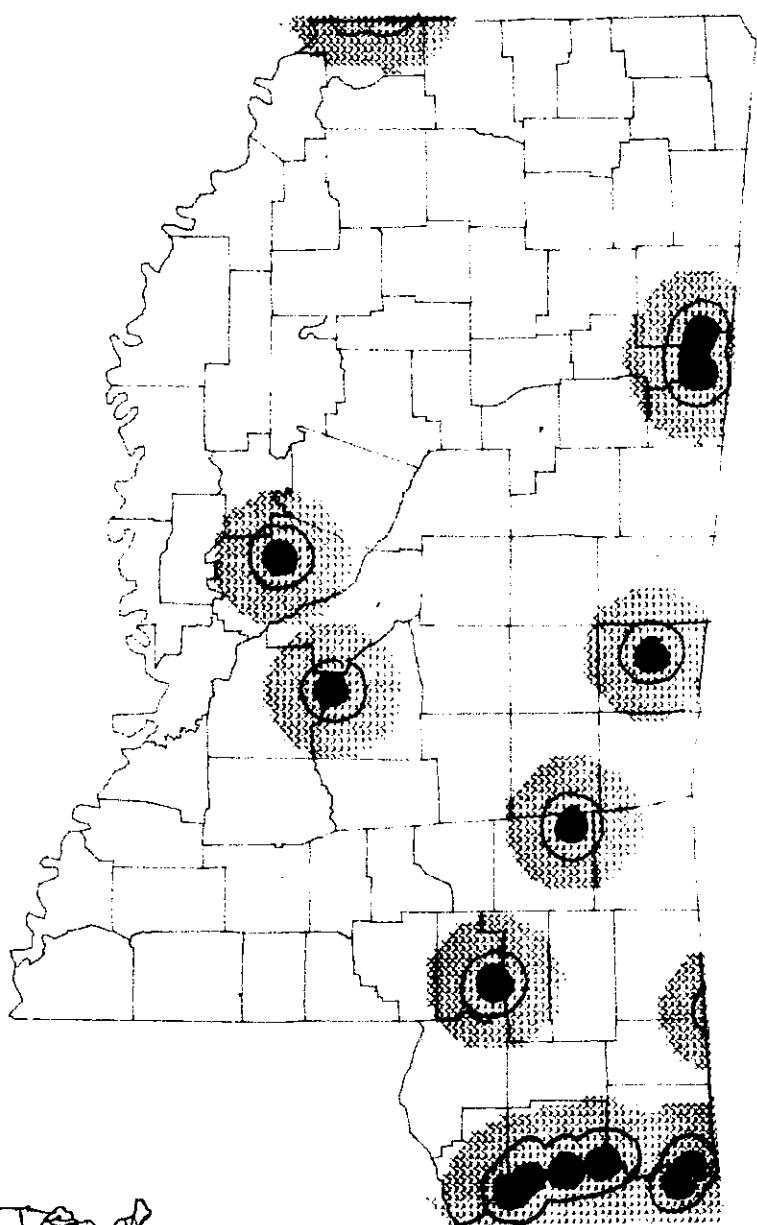
Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



D I R E C T E F F E C T S R I S K A R E A S

FEMA REGION IV - KENTUCKY

Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi

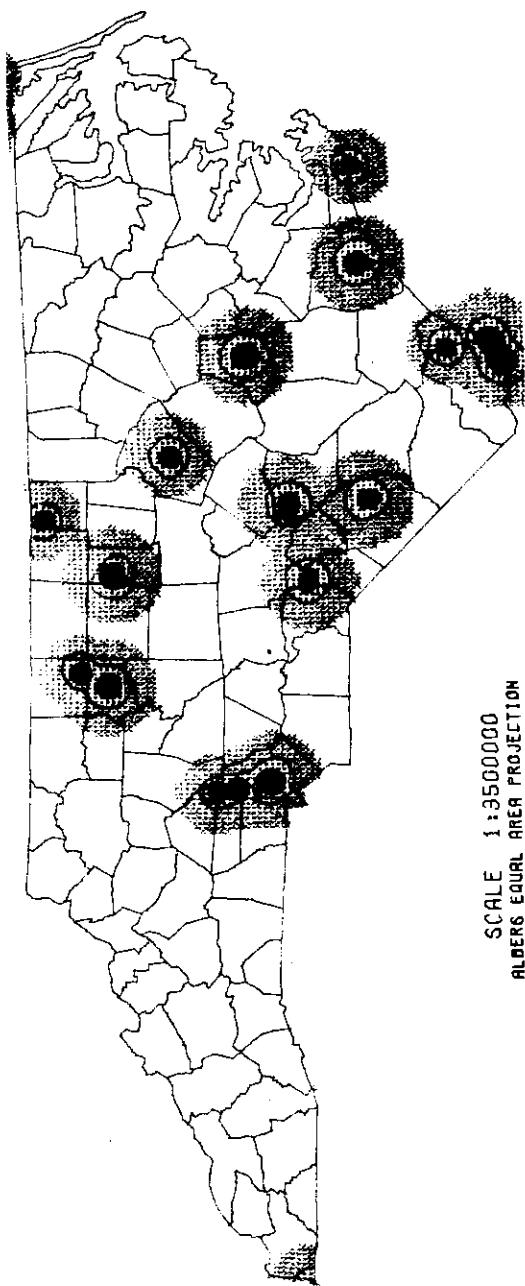


SCALE 1:2500000
ALBERS EQUAL AREA PROJECTION

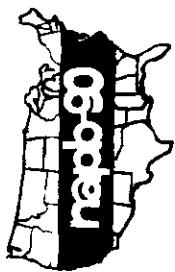
DIRECT EFFECTS RISK AREAS

FEMA REGION IV - MISSISSIPPI

Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



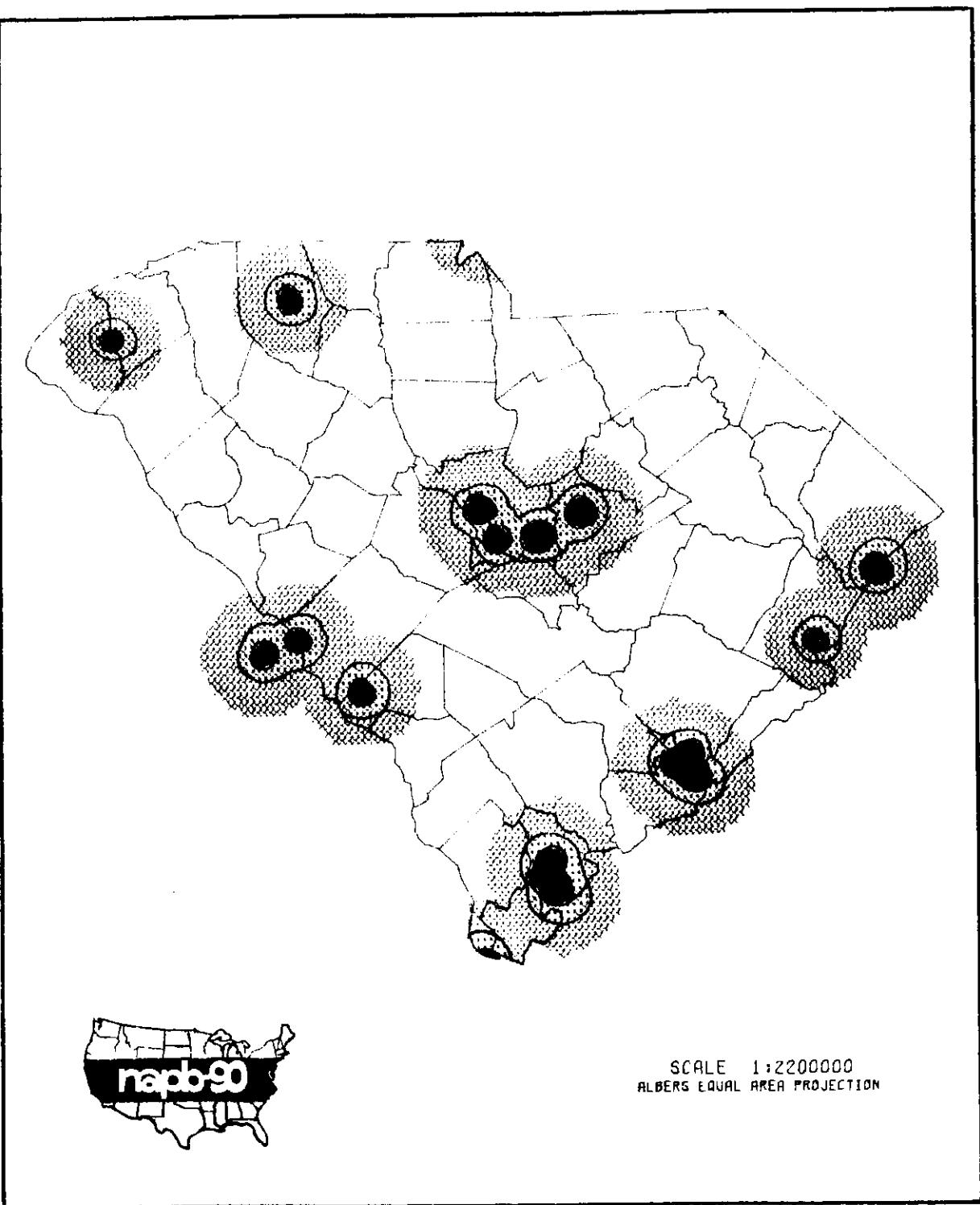
SCALE 1:3500000
ALBERS EQUAL AREA PROJECTION



D I R E C T E F F E C T S R I S K A R E A S

FEMA REGION IV - NORTH CAROLINA

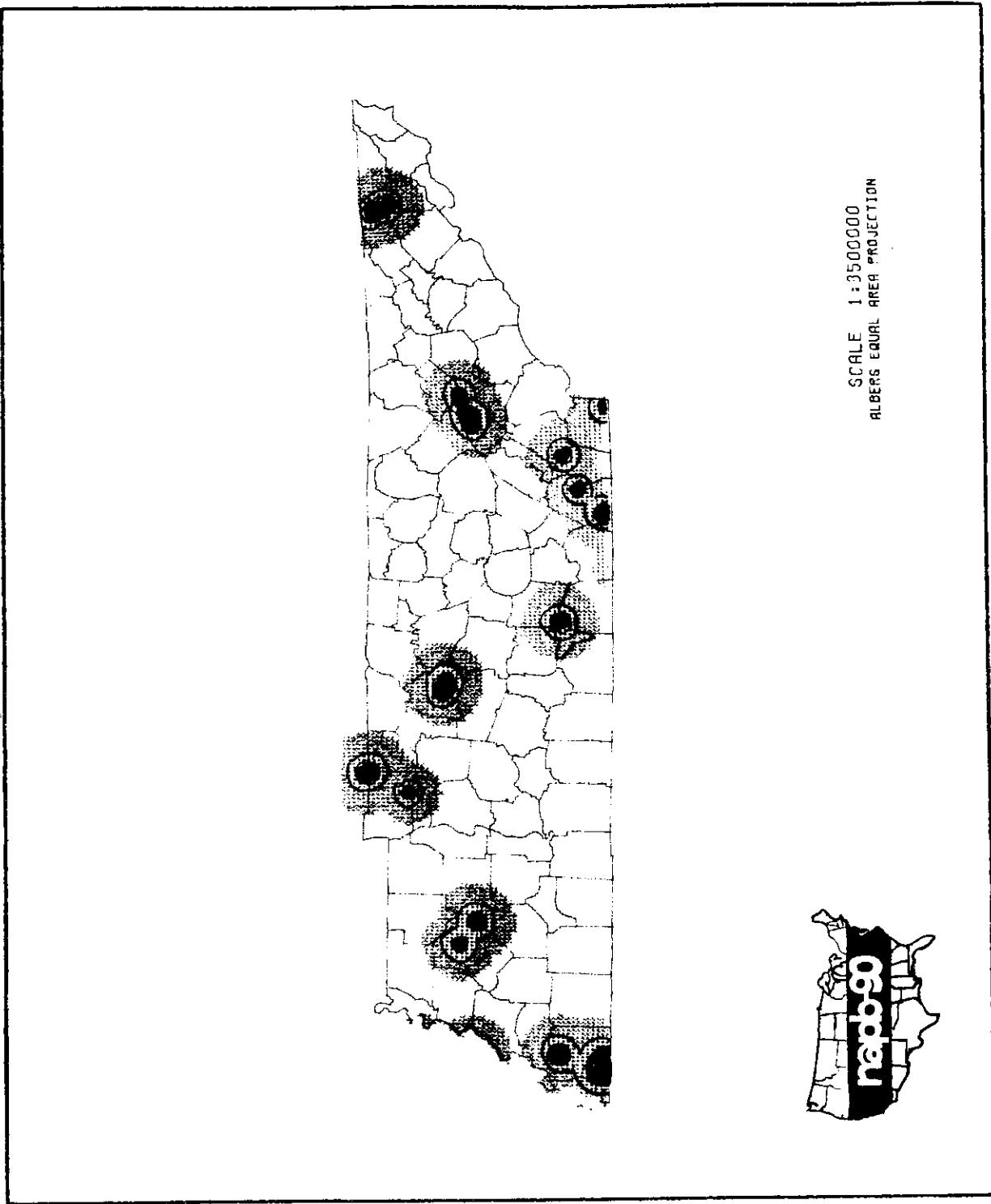
- Black Area: Equal to or greater than 5.0 psi
- Ringed Area: Equal to or greater than 2.0 psi
- Unringed Area: Equal to or greater than 0.5 psi



DIRECT EFFECTS RISK AREAS

FEMA REGION IV - SOUTH CAROLINA

Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



DIRECT EFFECTS RISK AREAS

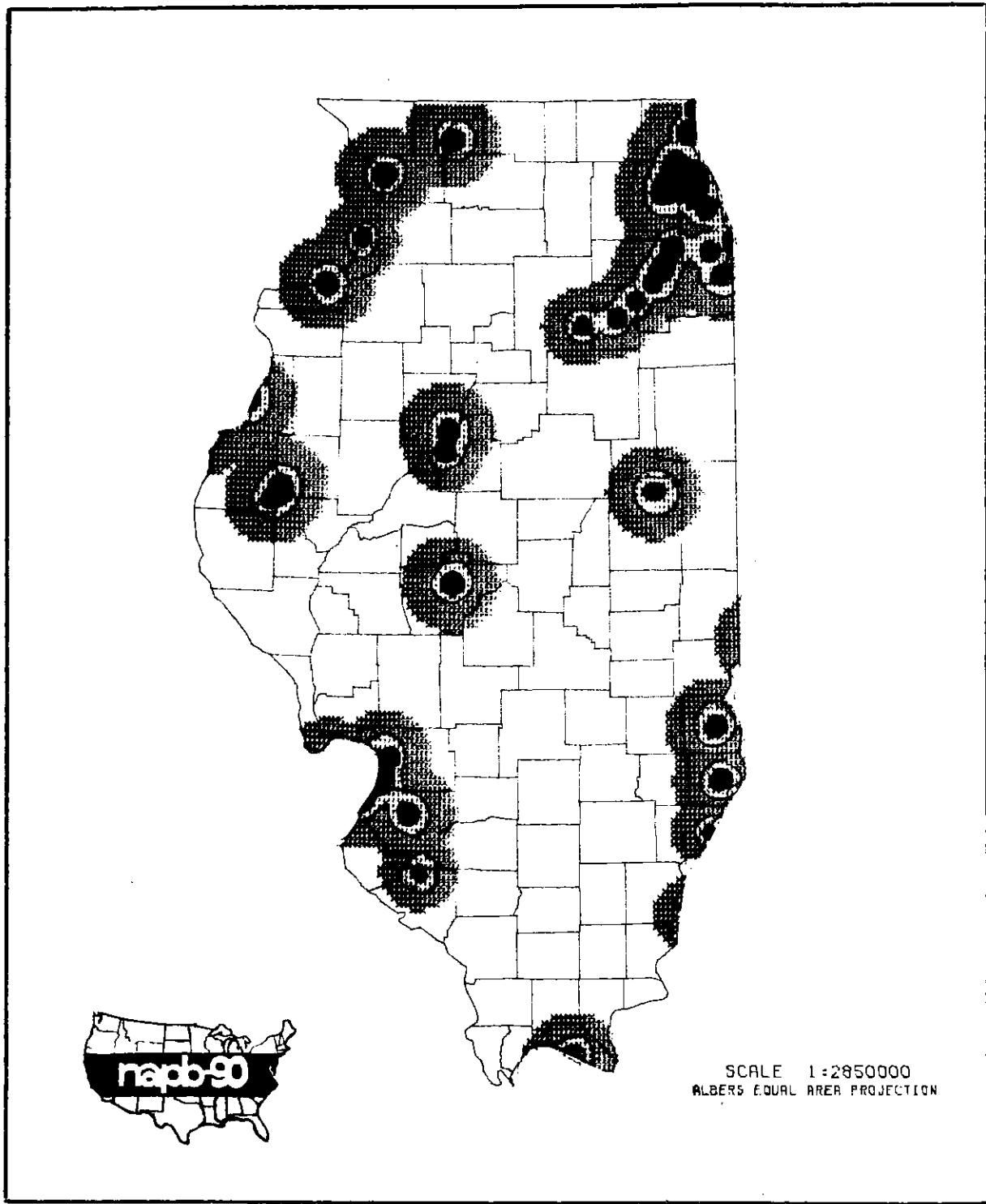
FEMA REGION IV - TENNESSEE

Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi

F E M A R E G I O N V - - D I R E C T E F F E C T S & F I R E R I S K S

STATE/DATA		TOTALS	VERY	HIGH	MEDIUM	LOW	NONE LT .5 psi
			GT 10 psi	5 to 10 psi	2 to 5 psi	.5 to 2 psi	
ILLINOIS	Population	11557256 (1.00)	2085709 (.18)	1624701 (.14)	3225483 (.28)	1914989 (.17)	2706374 (.23)
	Land Area	51586 (1.00)	1275 (.02)	1338 (.03)	4158 (.08)	12929 (.25)	32186 (.62)
INDIANA	Population	5499636 (1.00)	783413 (.14)	607437 (.11)	789434 (.14)	1088128 (.20)	2231224 (.41)
	Land Area	35963 (1.00)	555 (.02)	683 (.02)	2439 (.07)	10421 (.29)	21865 (.61)
MICHIGAN	Population	9030778 (1.00)	1570330 (.17)	1220636 (.14)	1918858 (.21)	1952054 (.22)	2368900 (.26)
	Land Area	57019 (1.00)	1042 (.02)	1238 (.02)	4227 (.07)	17869 (.31)	32643 (.57)
MINNESOTA	Population	4181231 (1.00)	645927 (.16)	446913 (.11)	589812 (.14)	.515383 (.12)	1983196 (.47)
	Land Area	79547 (1.00)	413 (.01)	418 (.01)	1333 (.02)	4745 (.06)	72638 (.91)
OHIO	Population	10638633 (1.00)	1605297 (.15)	1490643 (.14)	2611992 (.25)	3082059 (.29)	1848642 (.17)
	Land Area	41006 (1.00)	878 (.02)	1571 (.04)	4819 (.12)	18690 (.46)	15048 (.37)
WISCONSIN	Population	4779553 (1.00)	427685 (.09)	126942 (.03)	557331 (.12)	755110 (.16)	2912485 (.31)
	Land Area	54424 (1.00)	302 (.01)	264 (xxx)	1243 (.02)	4613 (.08)	48002 (.88)
REGION V	Population	45687087 (1.00)	7118361 (.16)	5517272 (.12)	9692910 (.21)	9307723 (.20)	14050821 (.31)
	Land Area	323545 (1.00)	4465 (.01)	5512 (.02)	18219 (.06)	69267 (.21)	226082 (.70)

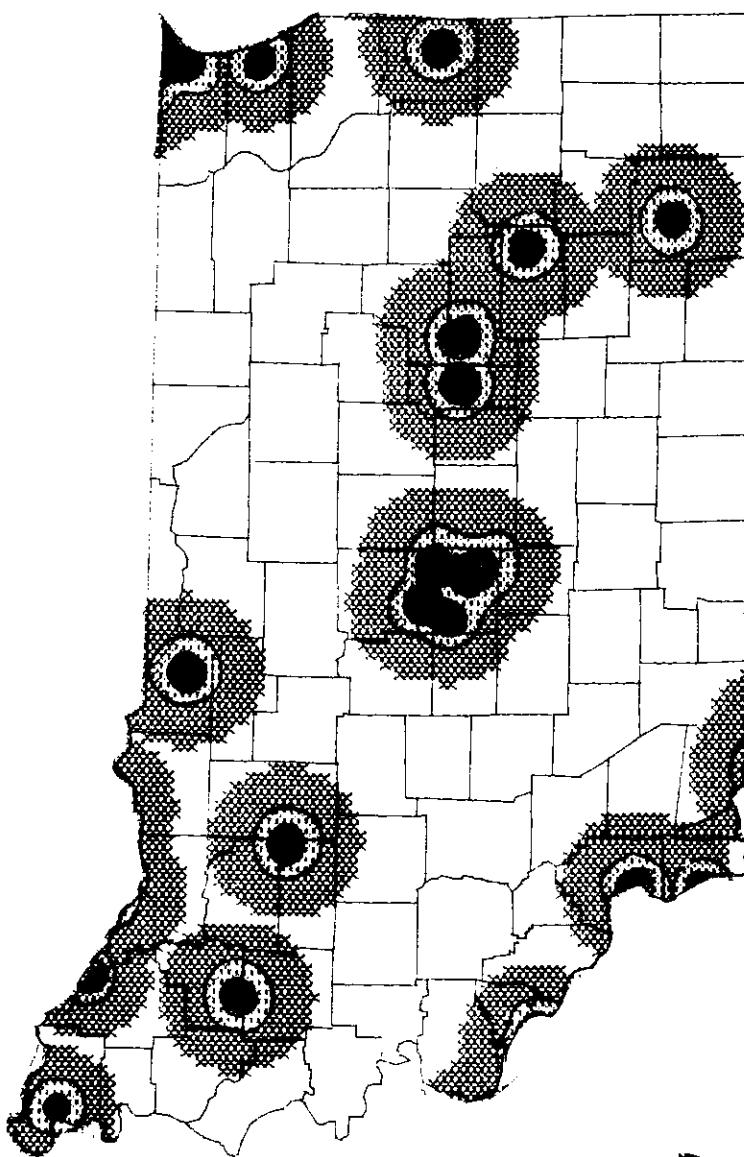
(xxx) Less than 1 percent



D I R E C T E F F E C T S R I S K A R E A S

F E M A R E G I O N V - I L L I N O I S

Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



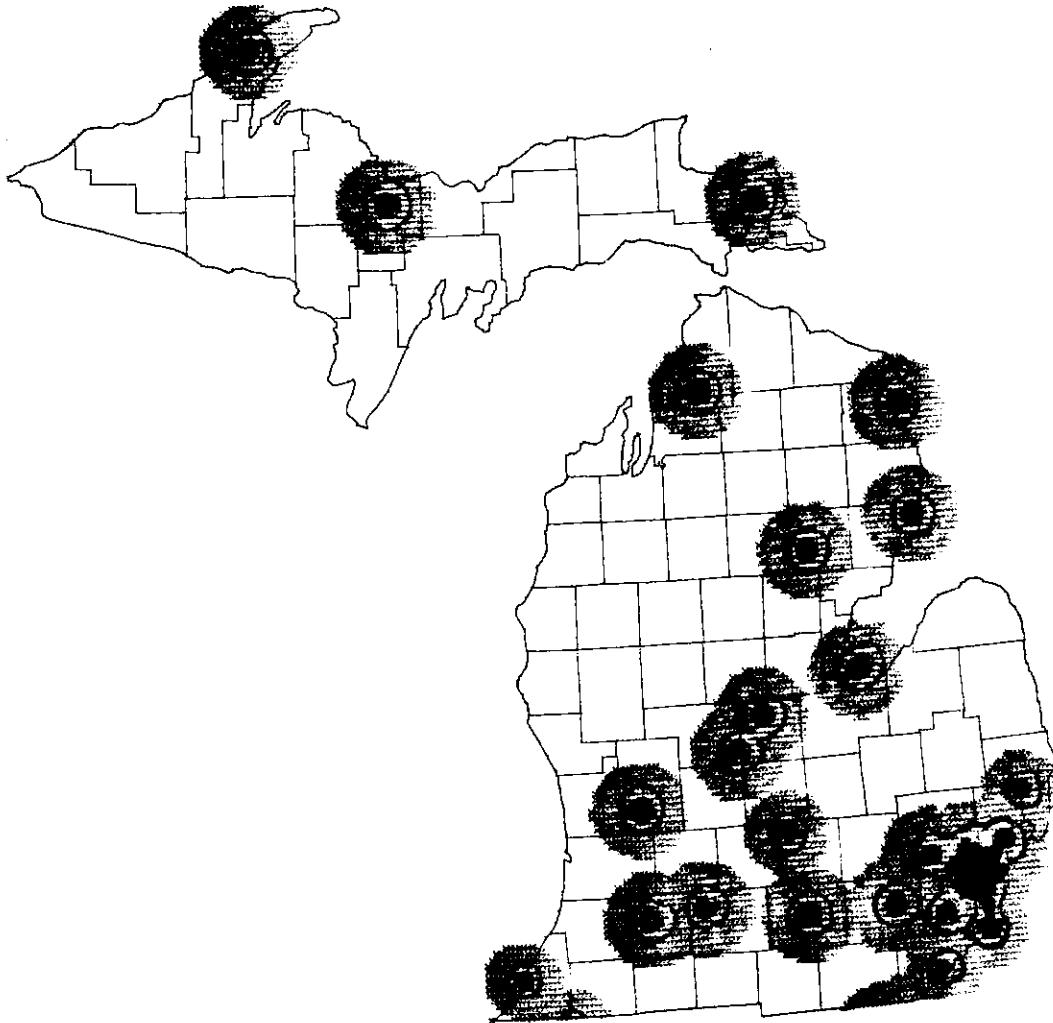
SCALE 1:2200000
ALBERS EQUAL AREA PROJECTION



DIRECT EFFECTS RISK AREAS

FEMA REGION V - INDIANA

- Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi

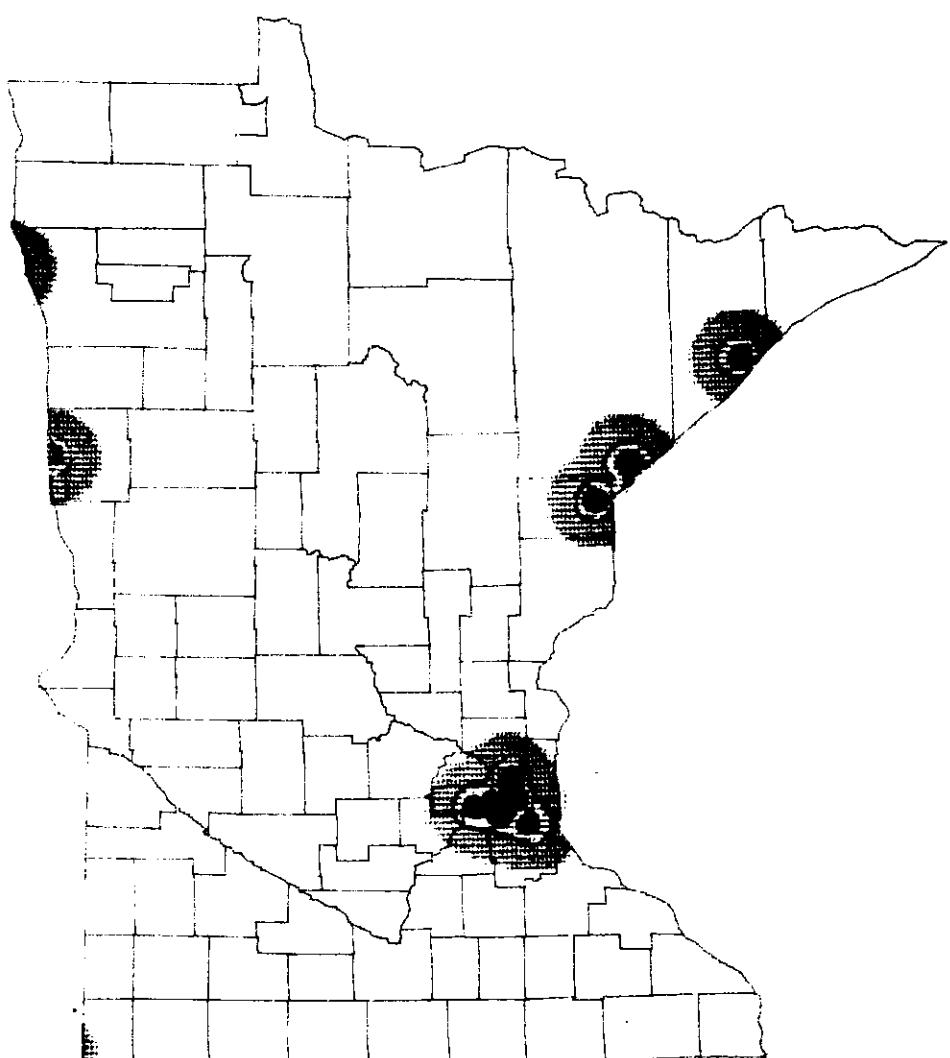


SCALE 1:3500000
ALBERS EQUAL AREA PROJECTION

DIRECT EFFECTS RISK AREAS

FEMA REGION V - MICHIGAN

- Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi

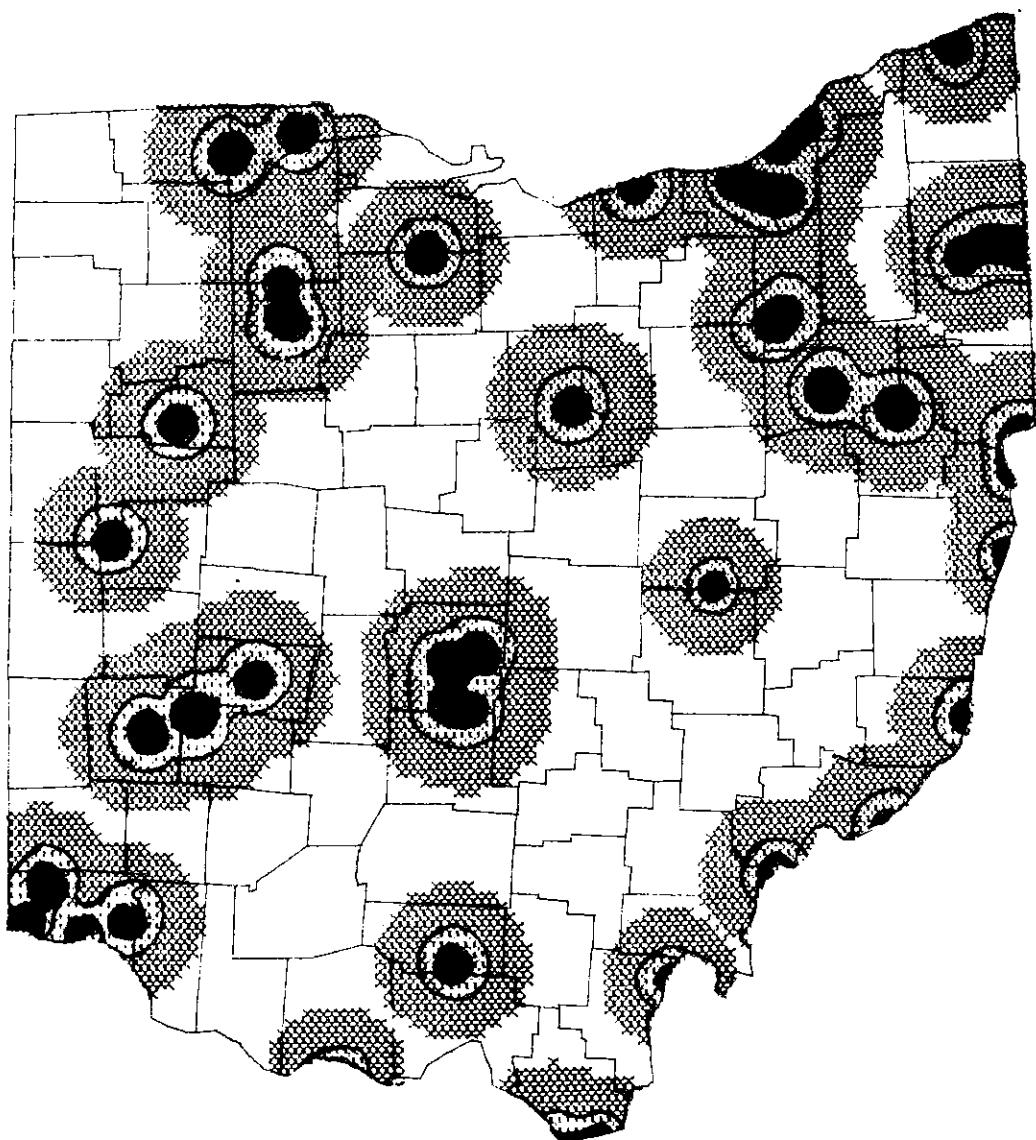


SCALE 1:3500000
ALBERS EQUAL AREA PROJECTION

DIRECT EFFECTS RISK AREAS

FEMA REGION V - MINNESOTA

- Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



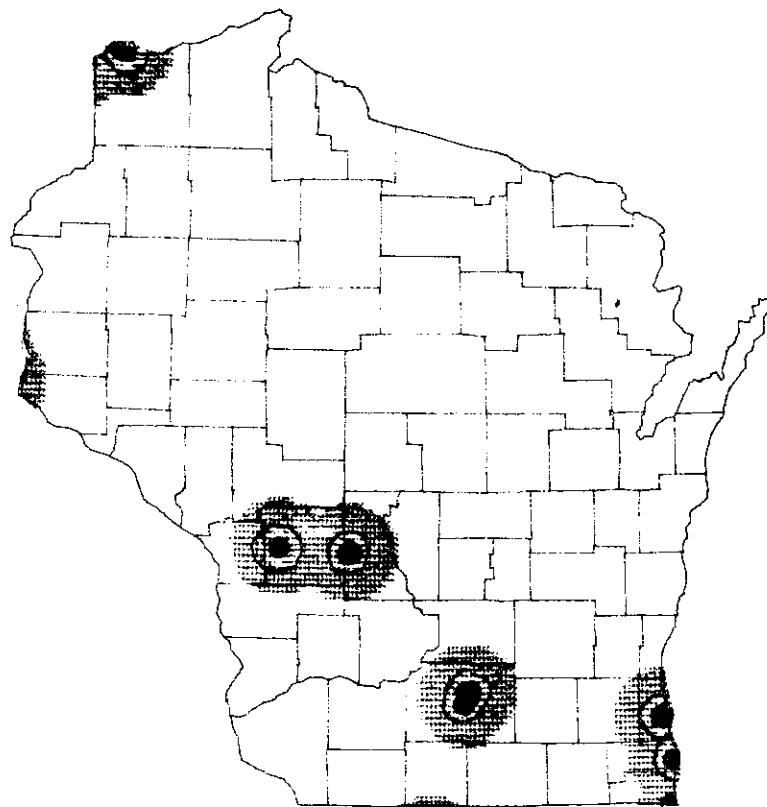
SCALE 1:2000000
ALBERS EQUAL AREA PROJECTION



DIRECT EFFECTS RISK AREAS

FEMA REGION V - OHIO

- Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



SCALE 1:3500000
ALBERS EQUAL AREA PROJECTION

DIRECT EFFECTS RISK AREAS

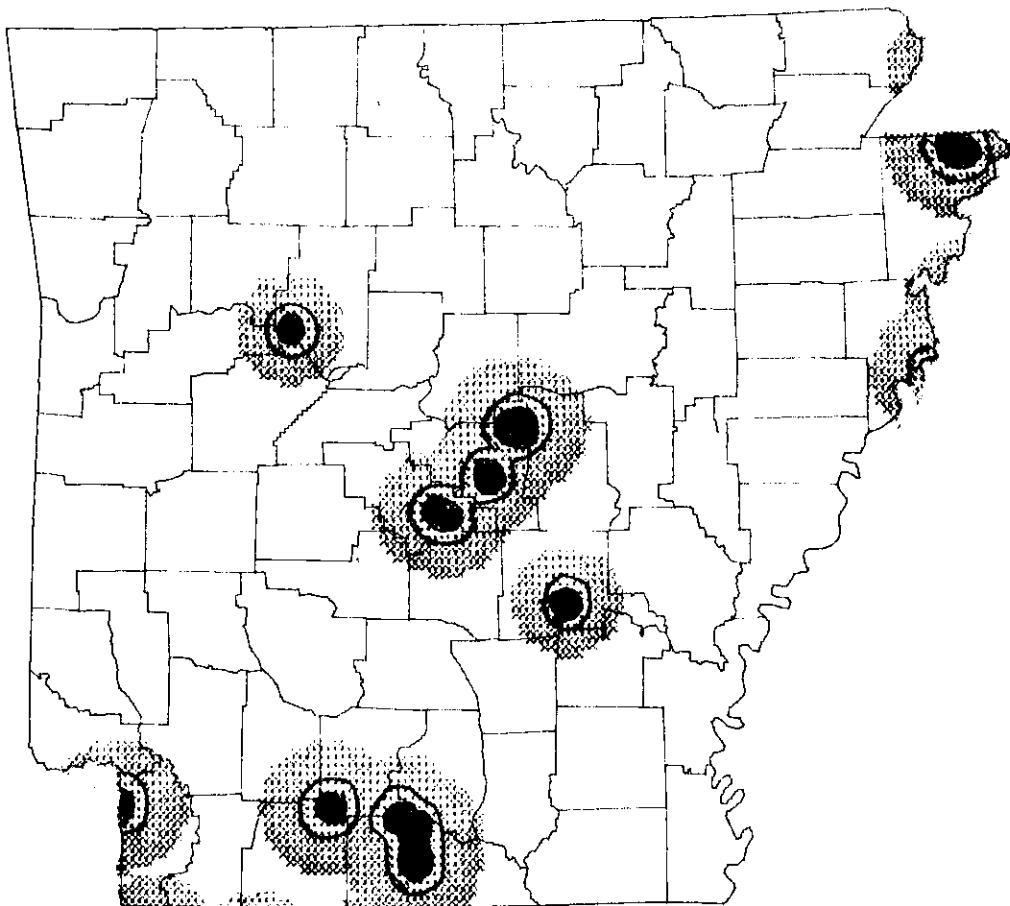
FEMA REGION V - WISCONSIN

Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi

F E M A R E G I O N V I - - D I R E C T E F F E C T S & F I R E R I S K S

STATE/DATA	TOTALS	HIGH			MEDIUM			LOW			NONE		
		GT 10 psi	5 to 10 psi	2 to 5 psi	2 to 5 psi	.5 to 2 psi	.5 to 2 psi	LT .5 psi					
ARKANSAS	Population	2363641 (1.00)	131262 (.06)	117493 (.13)	294869 (.21)	288032 (.16)	1531985 (.65)						
	Land Area	52082 (1.00)	265 (xxx)	333 (.01)	1291 (.02)	6009 (.12)	44184 (.85)						
LOUISIANA	Population	4525019 (1.00)	784371 (.17)	806928 (.05)	705803 (.12)	785040 (.19)	1442877 (.32)						
	Land Area	44520 (1.00)	1095 (.02)	1095 (.02)	3438 (.08)	11998 (.27)	27158 (.61)						
NEW MEXICO	Population	1460783 (1.00)	242269 (.16)	131289 (.18)	363755 (.16)	286246 (.12)	437224 (.30)						
	Land Area	121336 (1.00)	545 (xxx)	555 (xxx)	2826 (.02)	10331 (.09)	107709 (.89)						
OKLAHOMA	Population	3364919 (1.00)	365265 (.11)	427257 (.09)	634233 (.25)	744644 (.17)	1193520 (.35)						
	Land Area	68656 (1.00)	661 (.01)	762 (.01)	2962 (.04)	14553 (.21)	49718 (.72)						
TEXAS	Population	1642600 (1.00)	3169088 (.19)	2191289 (.13)	3872412 (.19)	3146160 (.20)	4047051 (.25)						
	Land Area	261989 (1.00)	2401 (.01)	2603 (.01)	9120 (.03)	37125 (.14)	210470 (.80)						
REGION VI	Population	28140362 (1.00)	4692255 (.17)	3674256 (.13)	5871072 (.21)	5250122 (.19)	8652657 (.31)						
	Land Area	548583 (1.00)	4703 (.01)	5348 (.01)	19637 (.04)	80016 (.15)	439536 (.80)						

(xxx) Less than 1 percent

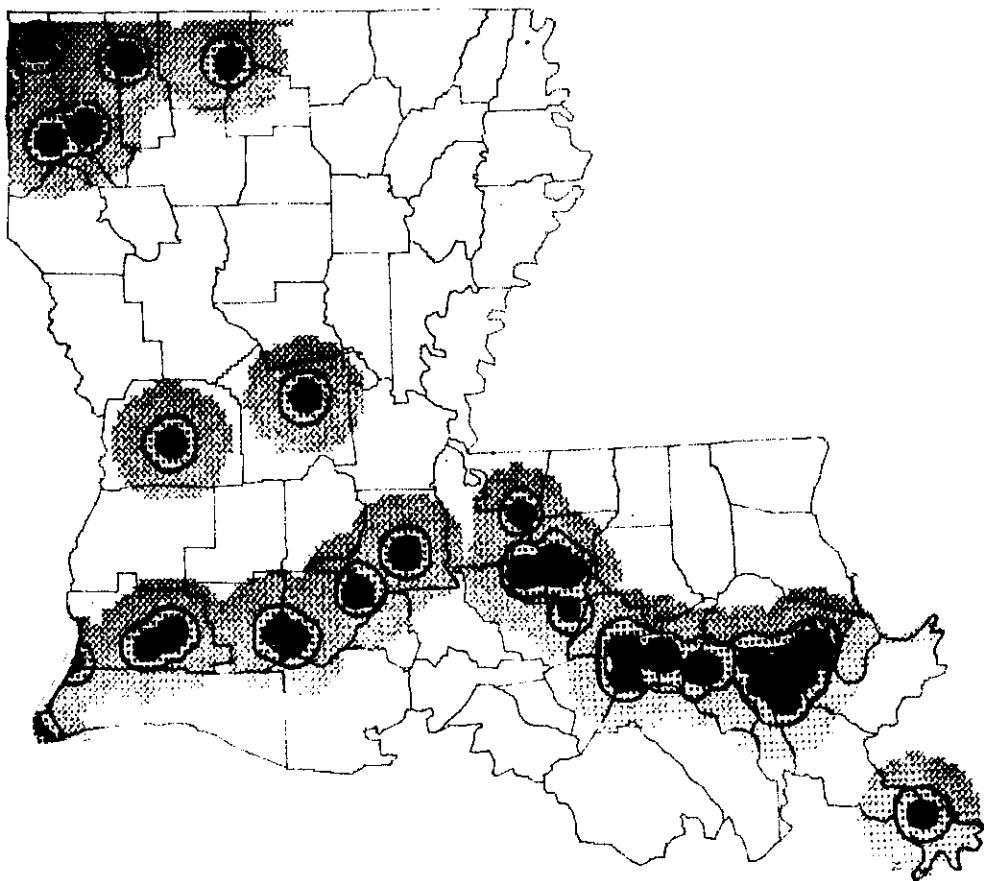


SCALE 1:2500000
ALBERS EQUAL AREA PROJECTION

DIRECT EFFECTS RISK AREAS

FEMA REGION VI - ARKANSAS

- Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi

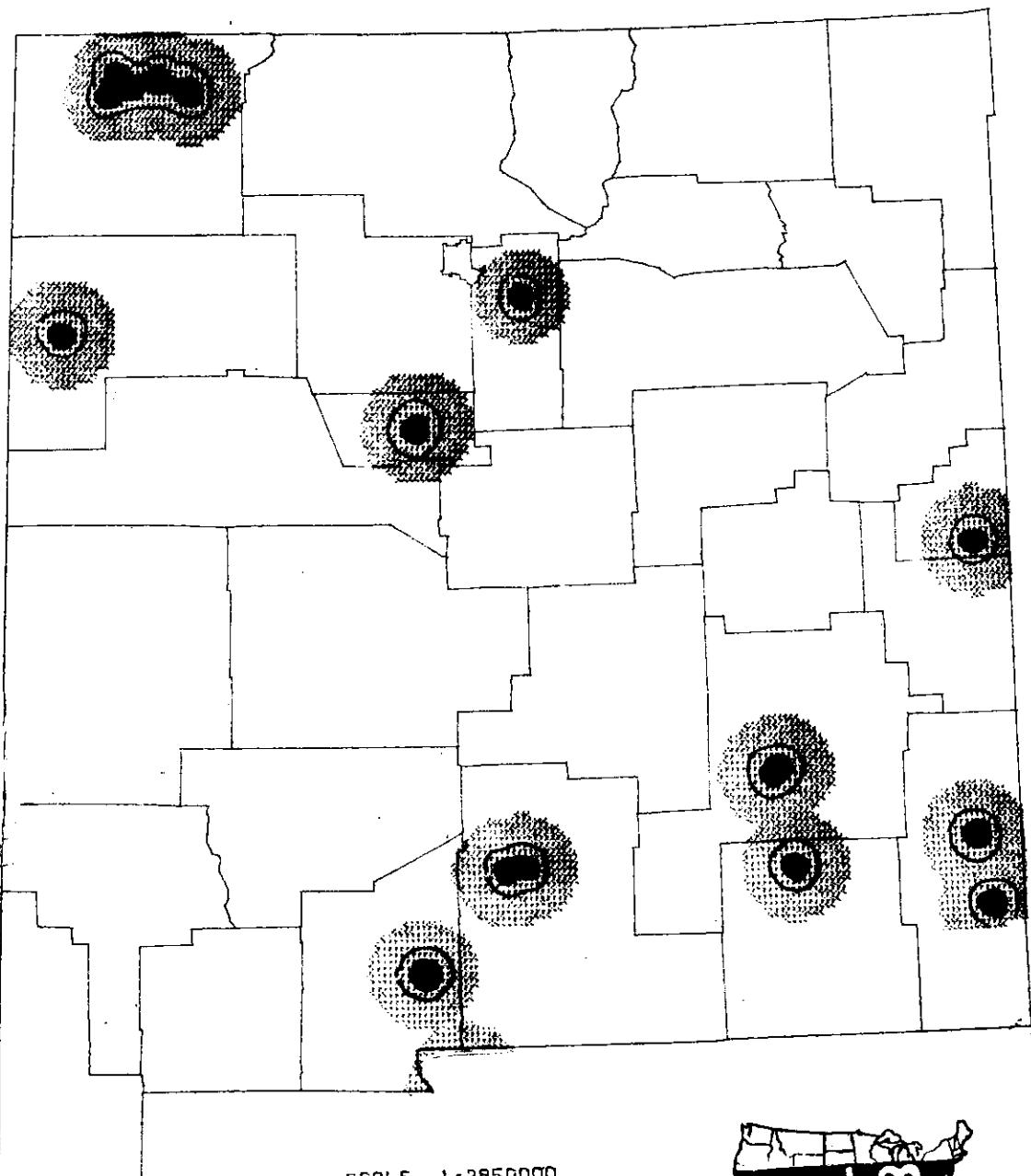


SCALE 1:2850000
ALBERS EQUAL AREA PROJECTION

DIRECT EFFECTS RISK AREAS

FEMA REGION VI - LOUISIANA

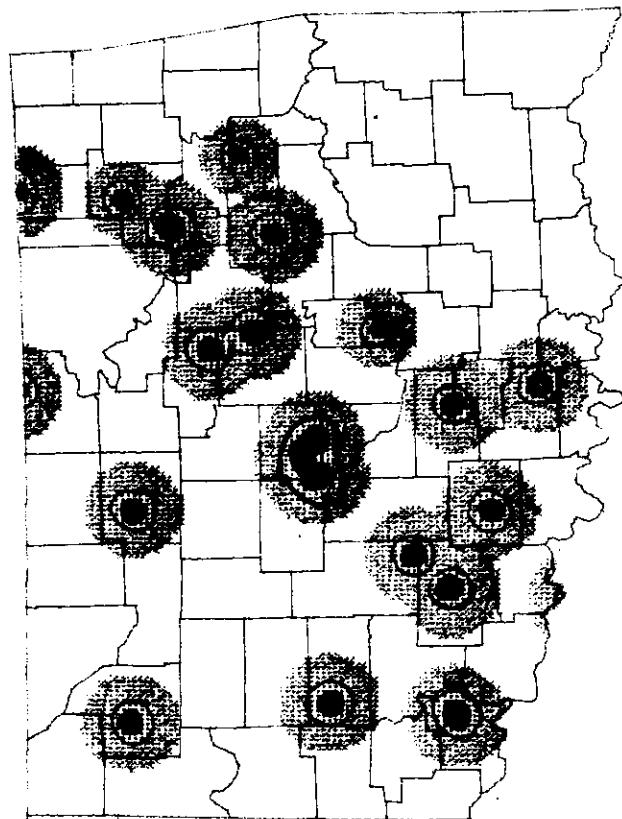
- Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



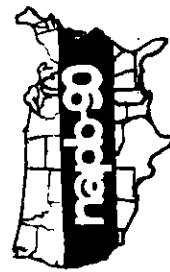
DIRECT EFFECTS RISK AREAS

FEMA REGION VI - NEW MEXICO

- Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



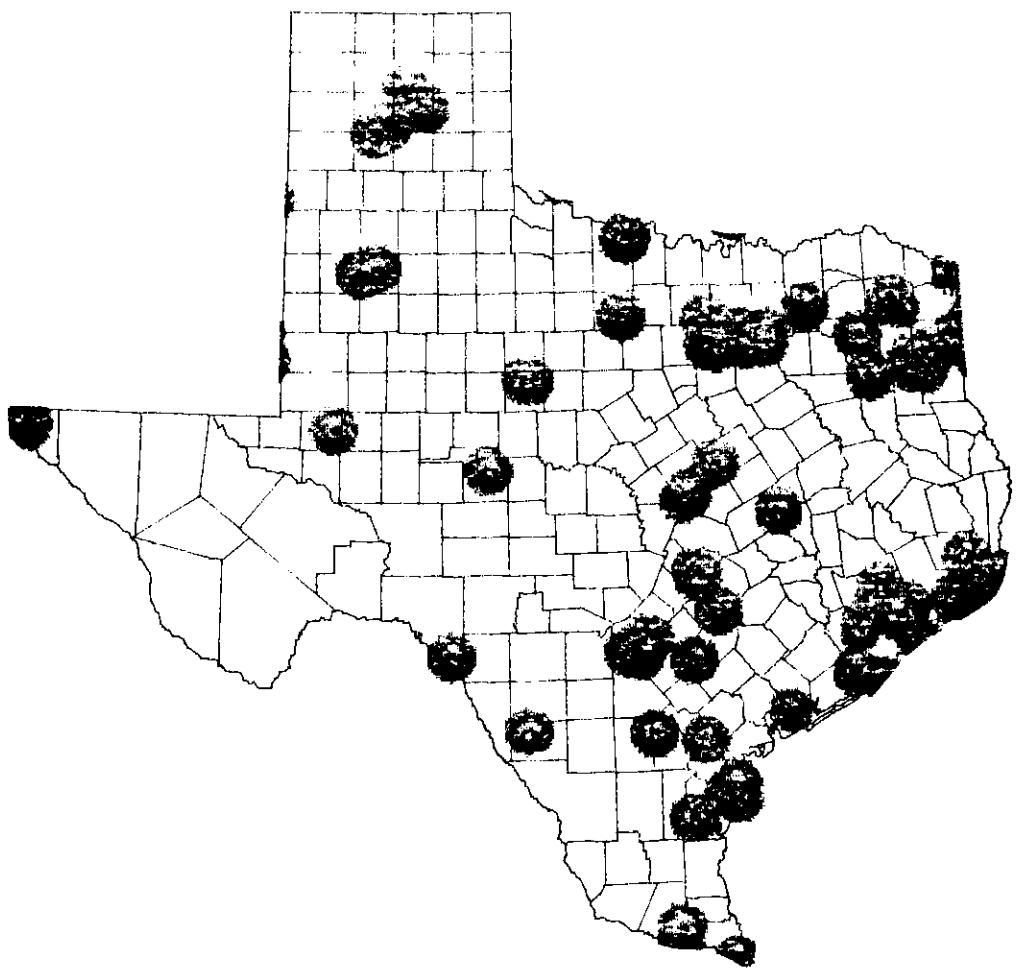
SCALE 1:3500000
ALBERS EQUAL AREA PROJECTION



DIRECT EFFECTS RISK AREAS

FEMA REGION VI - OKLAHOMA

- Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



SCALE 1:7000000
ALBERS EQUAL AREA PROJECTION

DIRECT EFFECTS RISK AREAS

FEMA REGION VI - TEXAS

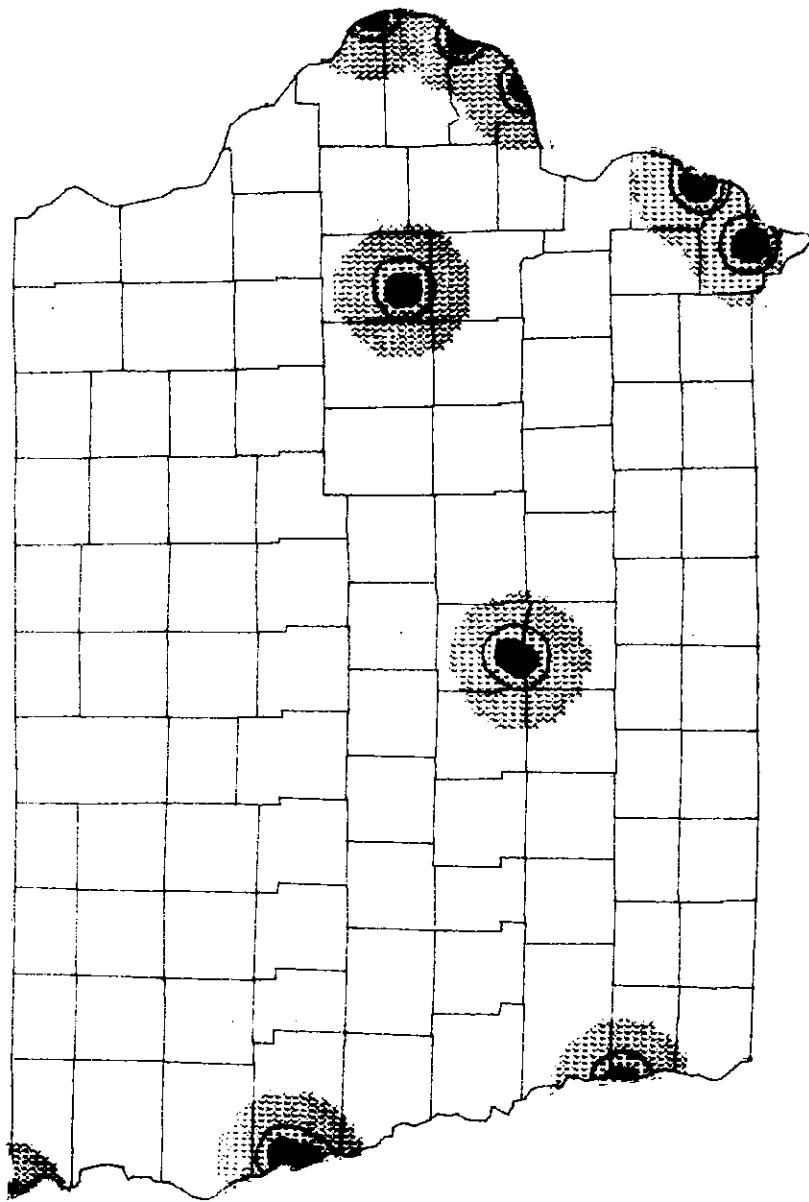
- Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi

F E M A R E G I O N V I I - - D I R E C T E F F E C T S & F I R E R I S K S

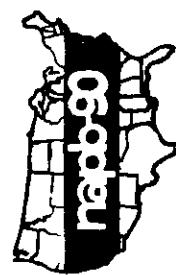
STATE/DATA	TOTALS	VERY HIGH Gt 10 psi	HIGH 5 to 10 psi	MEDIUM 2 to 5 psi	LOW .5 to 2 psi	LT .5 psi	NONE
IOWA	Population	2906939 (1.00)	226352 (.08)	165728 (.06)	292060 (.10)	338110 (.12)	1884689 (.65)
	Land Area	55964 (1.00)	249 (xxx)	301 (.01)	1153 (.02)	4783 (.09)	49496 (.88)
KANSAS	Population	2454933 (1.00)	453042 (.18)	173379 (.07)	401889 (.16)	541493 (.22)	885130 (.36)
	Land Area	81792 (1.00)	608 (.01)	693 (.01)	2741 (.03)	13420 (.16)	64330 (.79)
MISSOURI	Population	4968558 (1.00)	967727 (.20)	603807 (.12)	936030 (.19)	601981 (.12)	1859013 (.37)
	Land Area	68576 (1.00)	2936 (.04)	2571 (.04)	6247 (.09)	8262 (.13)	48194 (.70)
NEBRASKA	Population	1614811 (1.00)	171719 (.11)	78721 (.05)	170700 (.11)	449803 (.28)	743868 (.46)
	Land Area	76639 (1.00)	878 (.01)	1148 (.01)	3322 (.04)	5454 (.07)	65837 (.86)

REGION VII Population 11925241 (1.00) 1818840 (.15) 1021635 (.09) 1827679 (.15) 1931387 (.16) 5325700 (.45)
 Land Area 282971 (1.00) 4671 (.02) 4713 (.02) 13463 (.05) 31919 (.11) 227857 (.81)

(xxx) Less than 1 percent



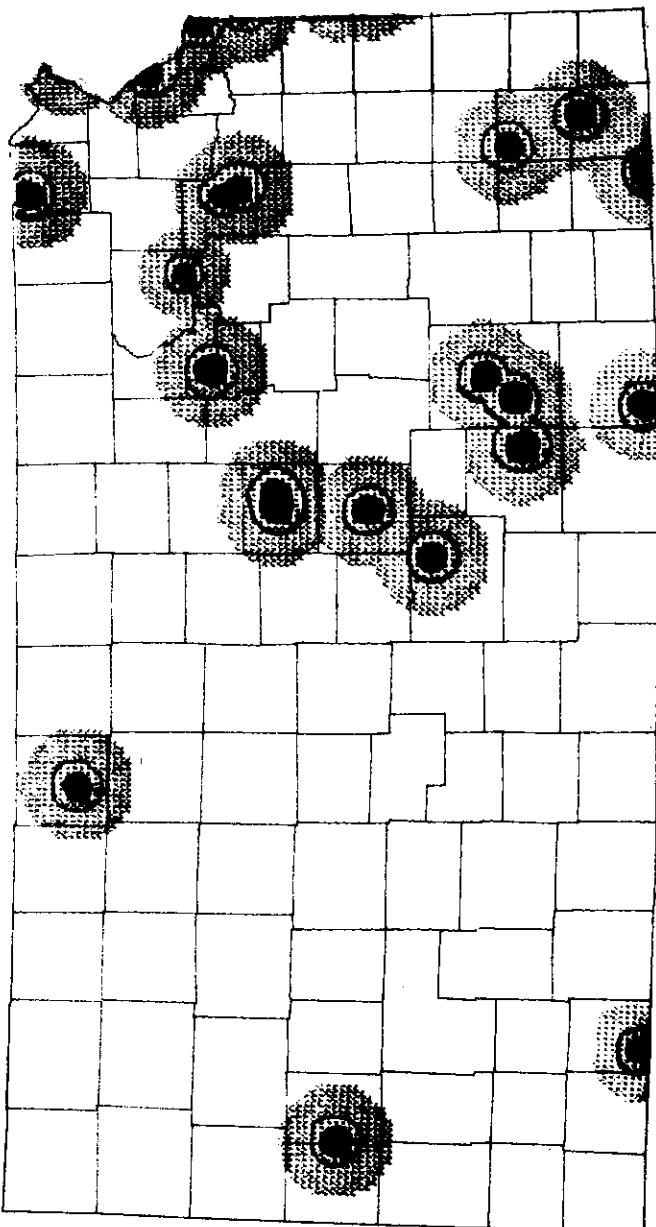
SCALE 1:2500000
ALBERS EQUAL AREA PROJECTION



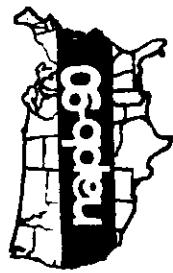
DIRECT EFFECTS RISK AREAS

FEMA REGION VII - IOWA

- Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



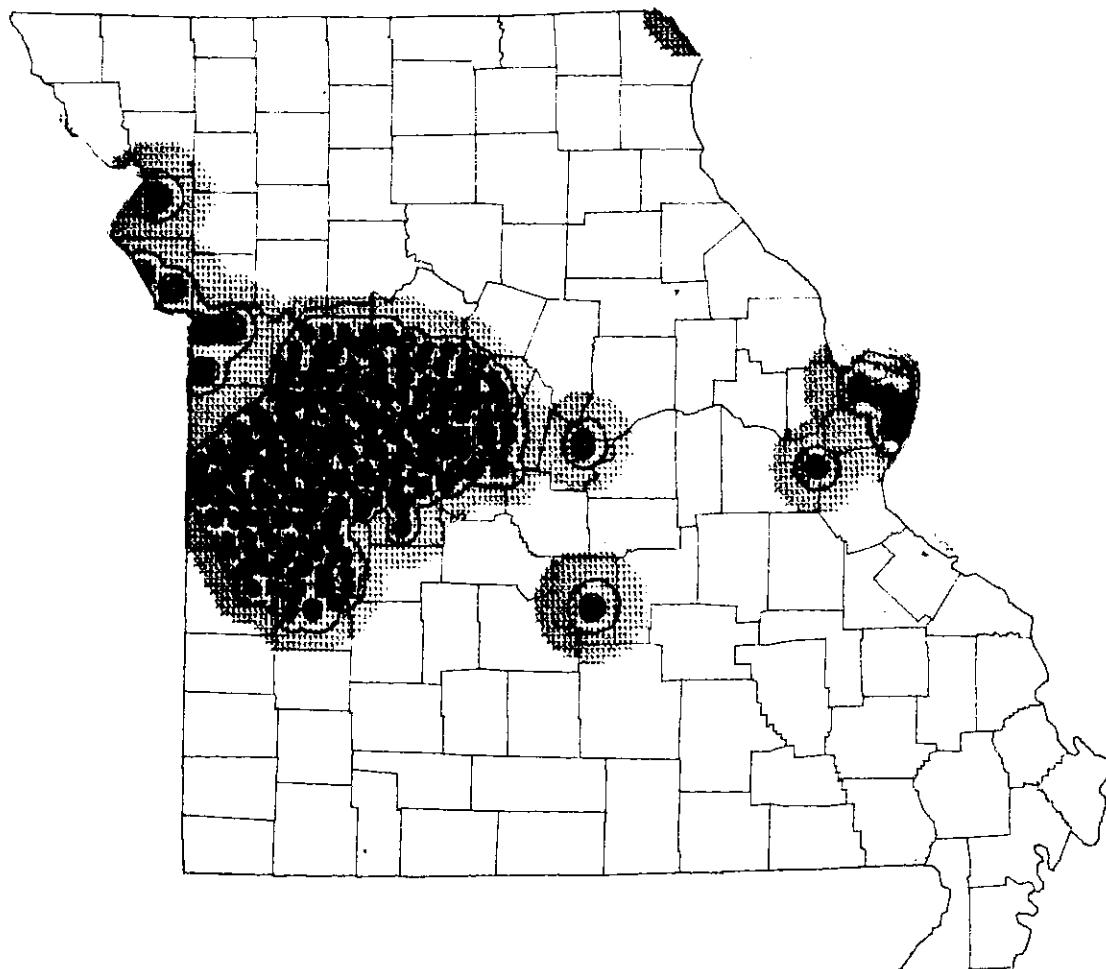
SCALE
1:3000000
MILES EQUAL AREA PROJECTION



DIRECT EFFECTS RISK AREAS

FEMA REGION VII - KANSAS

Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi

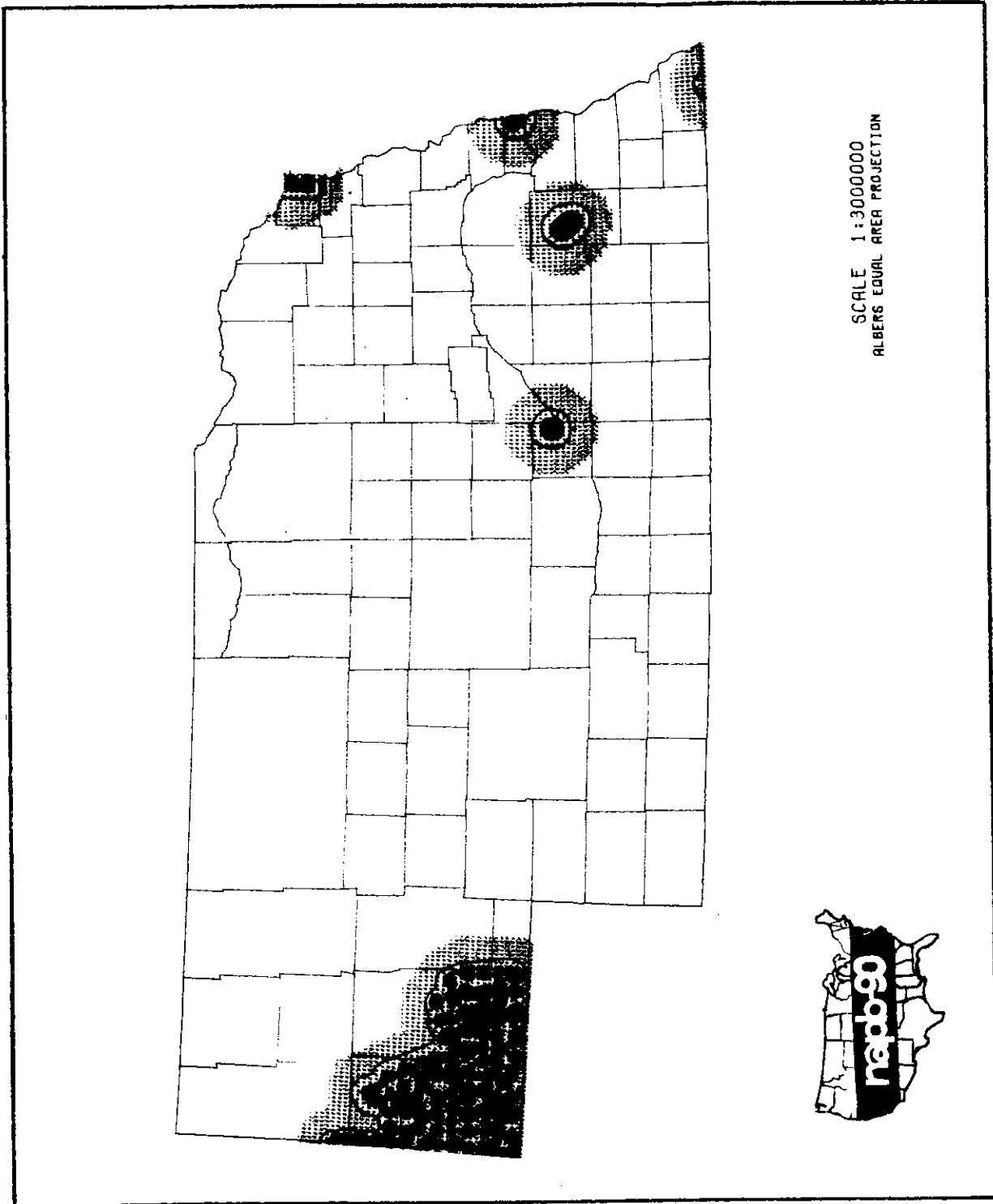


SCALE 1:3000000
ALBERS EQUAL AREA PROJECTION

DIRECT EFFECTS RISK AREAS

FEMA REGION VII - MISSOURI

- Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



DIRECT EFFECTS RISK AREAS

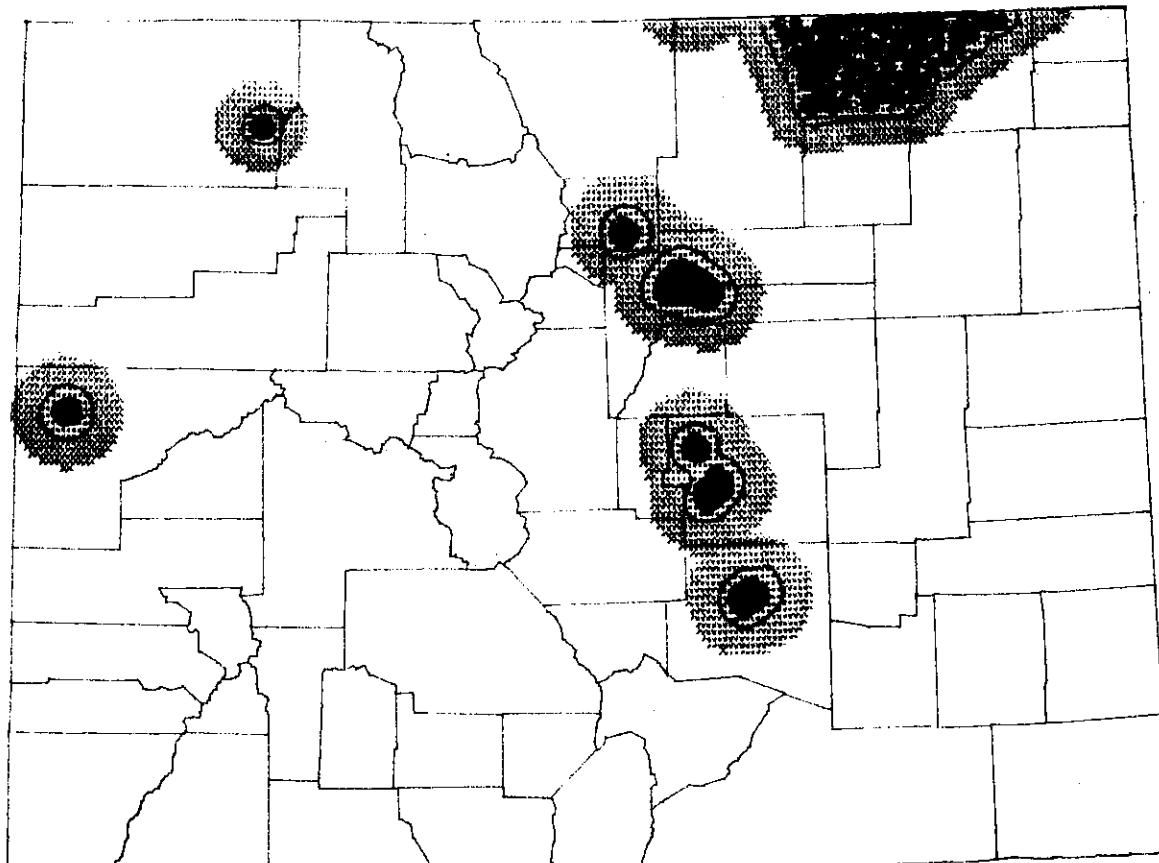
FEMA REGION VII - NEBRASKA

Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi

F E M A R E G I O N V I I I - - D I R E C T E F F E C T S & F I R E R I S K S

STATE/DATA		TOTALS	VERY HIGH	HIGH	MEDIUM	LOW	NONE LT .5 psi
			GT 10 psi	5 to 10 psi	2 to 5 psi	.5 to 2 psi	
COLORADO	Population	3250118 (1.00)	757230 (.23)	369050 (.11)	641107 (.20)	648655 (.20)	834076 (.26)
	Land Area	103652 (1.00)	883 (.01)	1043 (.01)	2777 (.03)	174 (xxx)	98775 (.95)
MONTANA	Population	832872 (1.00)	216472 (.27)	72913 (.08)	56899 (.07)	36289 (.05)	450299 (.53)
	Land Area	145365 (1.00)	3190 (.02)	3107 (.02)	10943 (.08)	19123 (.13)	109002 (.75)
NORTH DAKOTA	Population	697576 (1.00)	185802 (.27)	34321 (.04)	84588 (.11)	115679 (.17)	277186 (.40)
	Land Area	69344 (1.00)	5581 (.08)	5322 (.08)	9262 (.13)	15770 (.23)	33409 (.48)
SOUTH DAKOTA	Population	708728 (1.00)	92921 (.13)	27469 (.04)	58215 (.08)	76474 (.11)	453649 (.63)
	Land Area	75956 (1.00)	2687 (.04)	2434 (.03)	5321 (.07)	7802 (.10)	57732 (.76)
UTAH	Population	1698867 (1.00)	332028 (.19)	506954 (.30)	318150 (.19)	243378 (.14)	298357 (.18)
	Land Area	82094 (1.00)	349 (xxx)	582 (.01)	1566 (.02)	6676 (.08)	72921 (.89)
WYOMING	Population	521570 (1.00)	161633 (.31)	51107 (.10)	25544 (.06)	22278 (.04)	261008 (.50)
	Land Area	97086 (1.00)	1428 (.01)	1720 (.02)	4581 (.05)	10950 (.11)	78407 (.81)
REGION VIII	Population	7709731 (1.00)	1746086 (.23)	1061814 (.14)	1184503 (.15)	1143293 (.15)	2574035 (.33)
	Land Area	573497 (1.00)	14118 (.02)	14208 (.02)	34450 (.06)	60495 (.11)	450246 (.79)

(xxx) Less than 1 percent

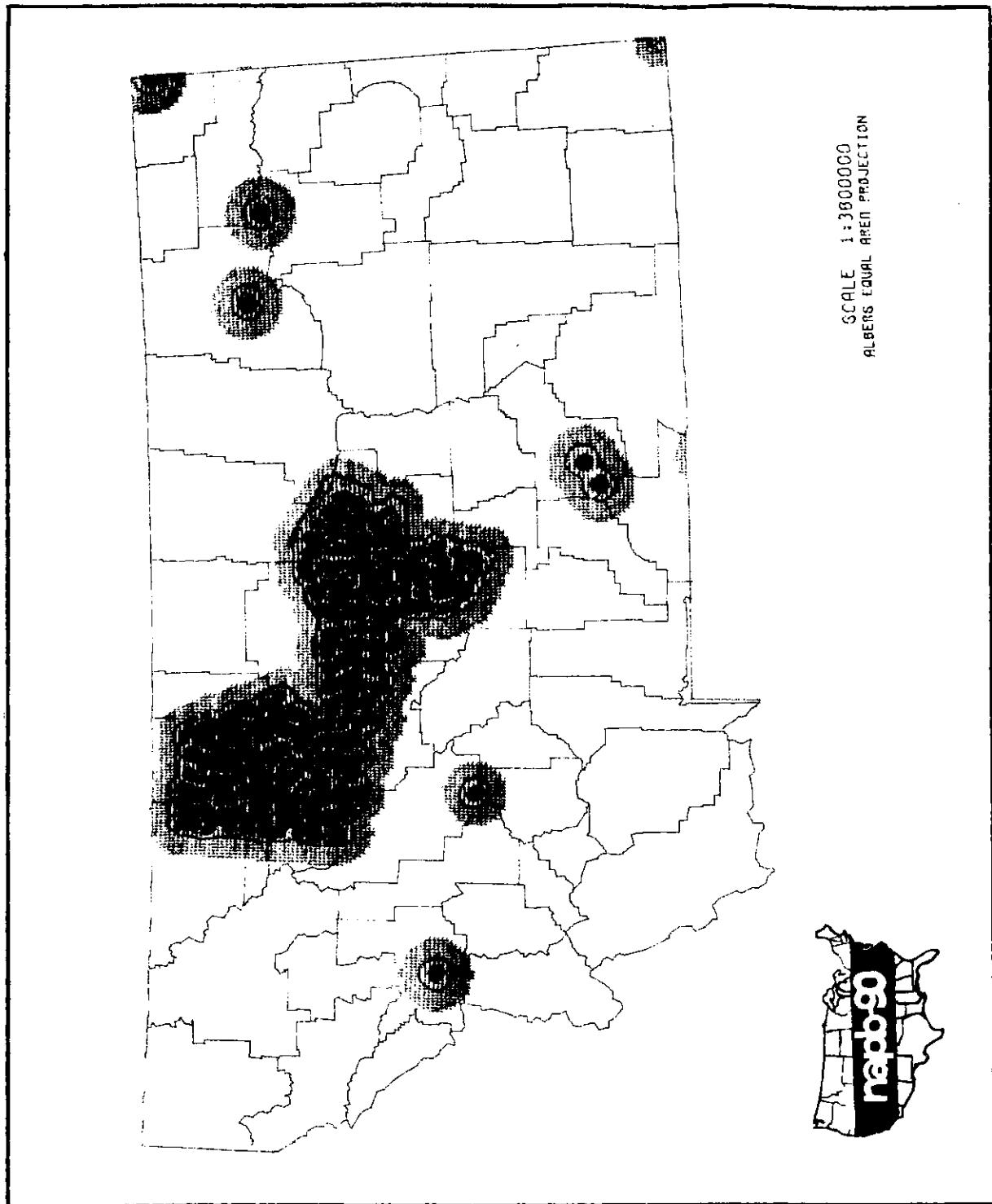


SCALE 1:3000000
ALBERS EQUAL AREA PROJECTION

DIRECT EFFECTS RISK AREAS

FEMA REGION VIII - COLORADO

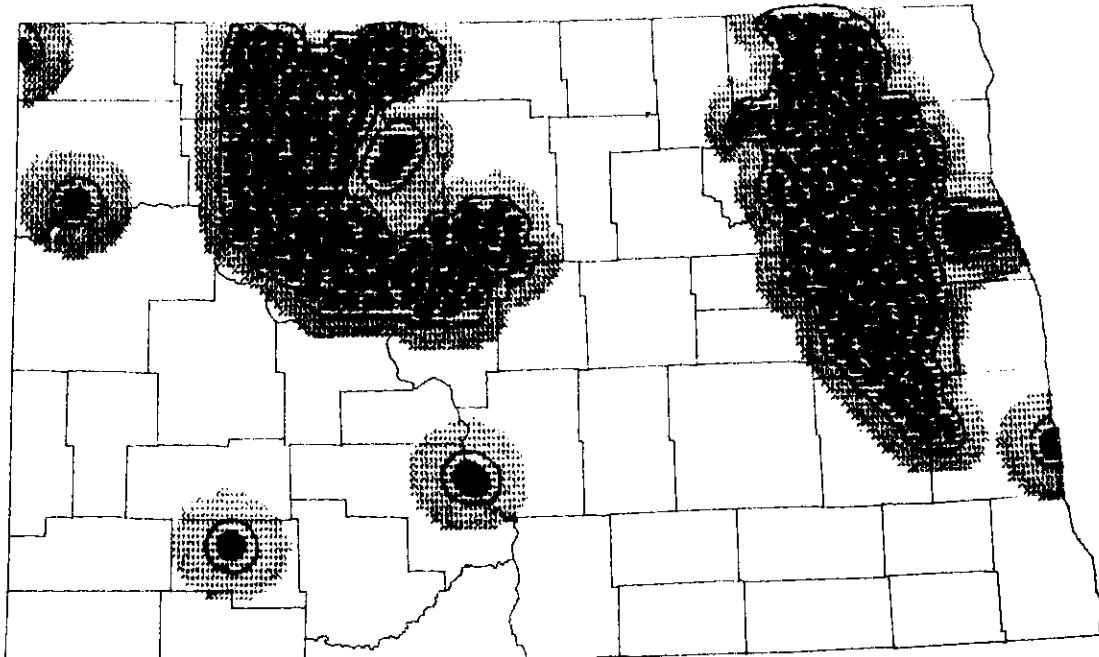
- Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



DIRECT EFFECTS RISK AREAS

FEMA REGION VIII - MONTANA

Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi

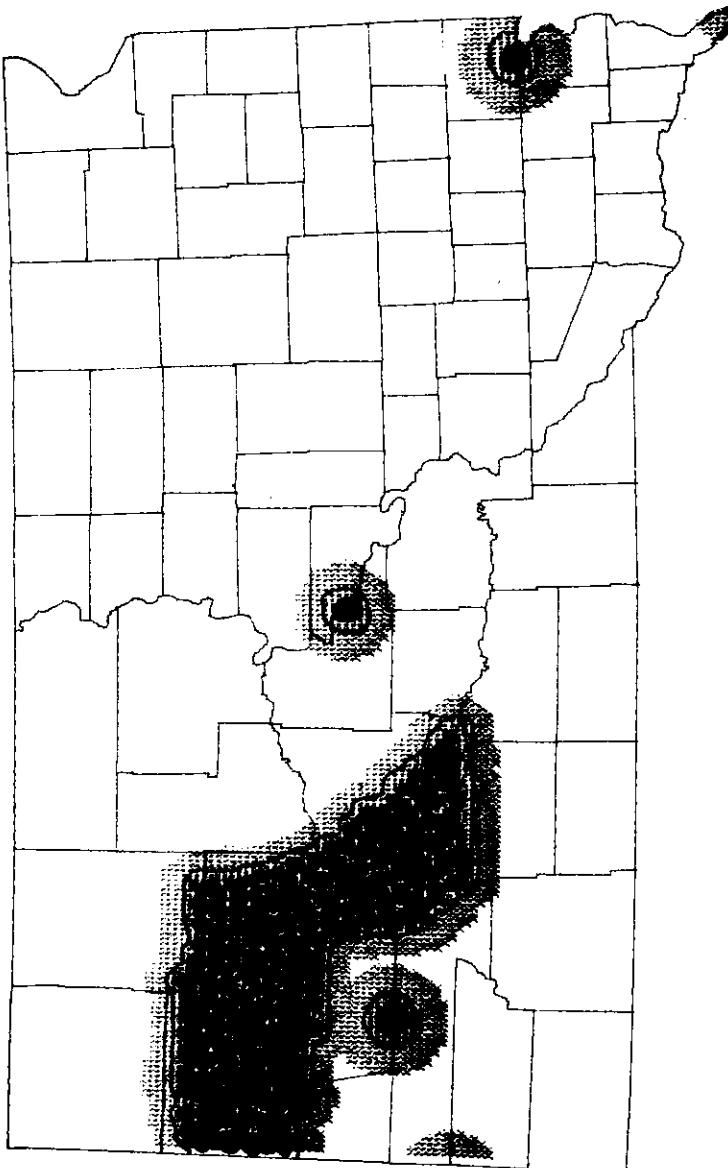


SCALE 1:3000000
ALBERS EQUAL AREA PROJECTION

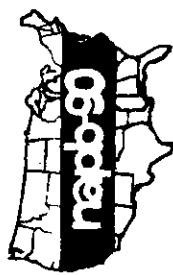
DIRECT EFFECTS RISK AREAS

FEMA REGION VIII - NORTH DAKOTA

- Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



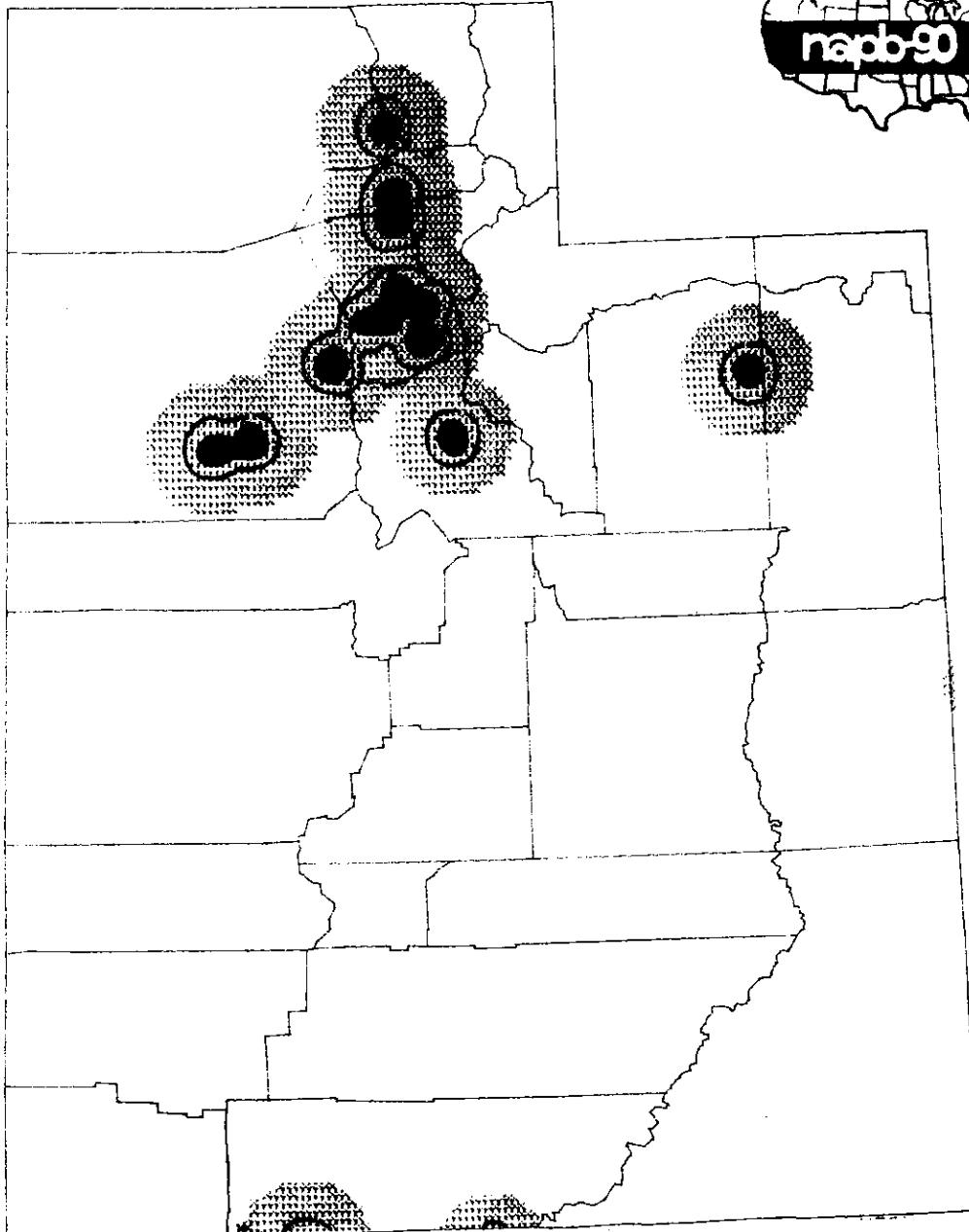
SCALE 1:3000000
ALBERS EQUAL AREA PROJECTION



DIRECT EFFECTS RISK AREAS

FEMA REGION VIII - SOUTH DAKOTA

- Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi

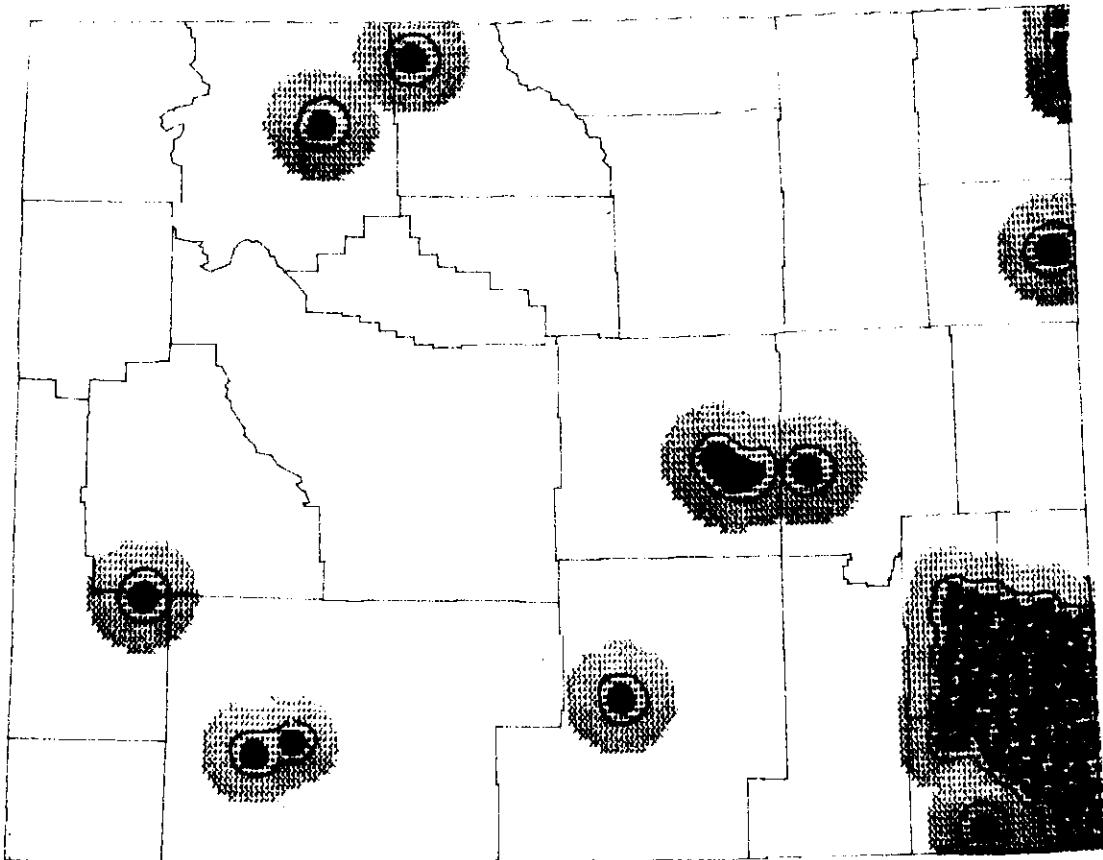


SCALE 1:2500000
ALBERS EQUAL AREA PROJECTION

D I R E C T E F F E C T S R I S K A R E A S

F E M A R E G I O N V I I I - U T A H

Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



SCALE 1:3000000
ALBERS EQUAL AREA PROJECTION

D I R E C T E F F E C T S R I S K A R E A S

F E M A R E G I O N V I I I - W Y O M I N G

- Black Area: Equal to or greater than 5.0 psi
- Ringed Area: Equal to or greater than 2.0 psi
- Unringed Area: Equal to or greater than 0.5 psi

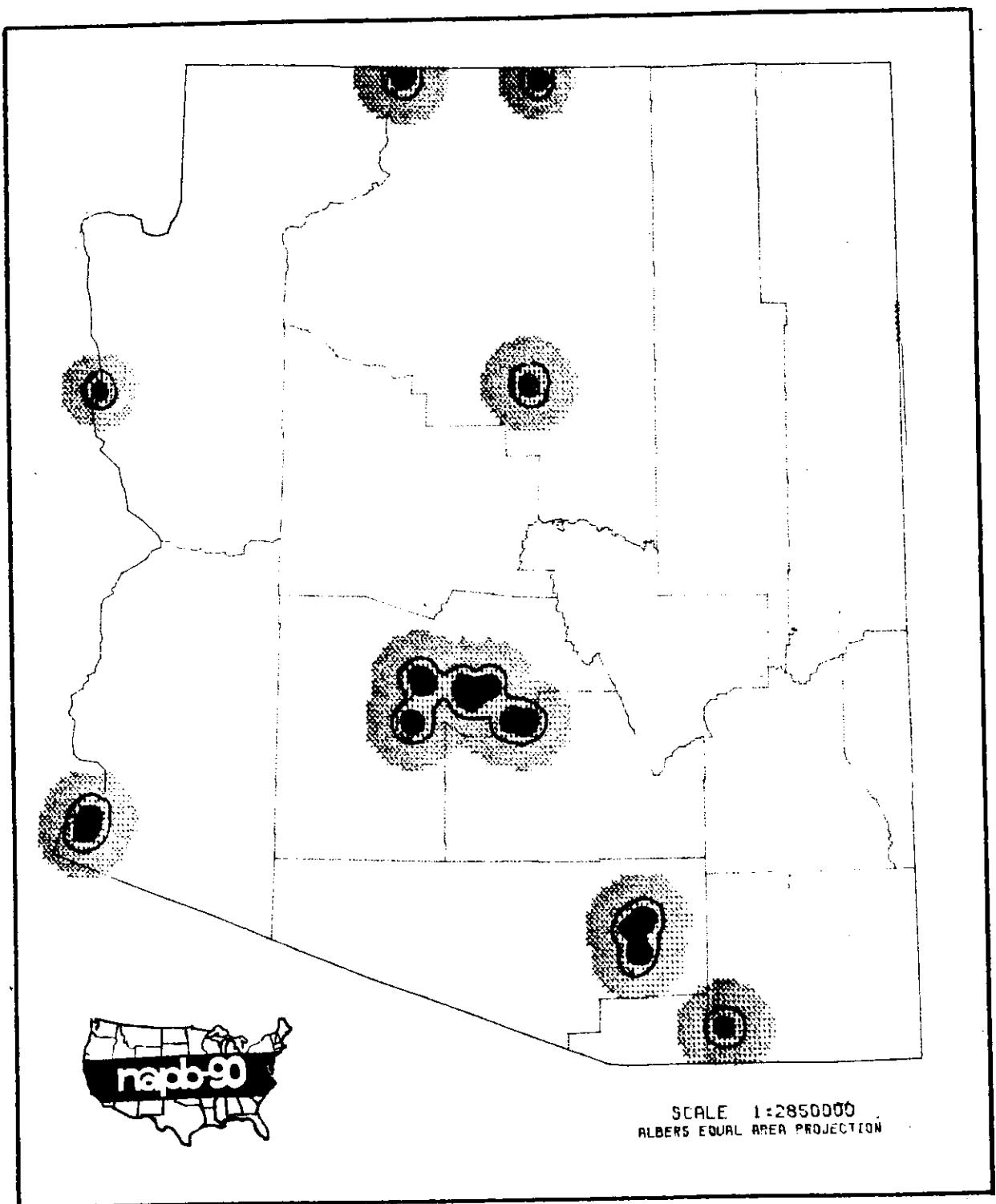
F E M A R E G I O N I X - - D I R E C T E F F E C T S & F I R E R I S K S

STATE/DATA	TOTALS	HIGH			MEDIUM			LOW			NONE	
		GT 10 psi	5 to 10 psi	2 to 5 psi	2 to 5 psi	.5 to 2 psi	.5 to 2 psi	LT .5 psi	LT .5 psi	LT .5 psi	LT .5 psi	LT .5 psi
ARIZONA	Population	3138988 (1.00)	583952 (.18)	384090 (.12)	1105668 (.35)	469613 (.15)	595665 (.19)					
	Land Area	113550 (1.00)	640 (.01)	503 (xxx)	2158 (.02)	713 (.07)	102536 (.90)					
CALIFORNIA	Population	26105844 (1.00)	8712562 (.33)	4797722 (.03)	6871350 (.26)	3085422 (.12)	2638788 (.10)					
	Land Area	156279 (1.00)	3550 (.02)	3015 (.02)	9527 (.06)	36501 (.23)	103686 (.66)					
HAWAII	Population	1057270 (1.00)	327778 (.31)	105940 (.10)	186162 (.18)	250400 (.24)	186990 (.17)					
	Land Area	6427 (1.00)	*	*	*	*	*	*	*	*	*	*
NEVADA	Population	938191 (1.00)	249851 (.27)	159296 (.17)	312581 (.33)	112158 (.12)	104305 (.12)					
	Land Area	109895 (1.00)	328 (xxx)	365 (xxx)	1402 (xxx)	6226 (.06)	101574 (.92)					
SAMOA	Population	35000 (1.00)	*	*	*	*	*	*	*	*	*	*
	Land Area	77 (1.00)	*	*	*	*	*	*	*	*	*	*
GUAM	Population	112900 (1.00)	*	*	*	*	*	*	*	*	*	*
	Land Area	209 (1.00)	*	*	*	*	*	*	*	*	*	*
TRUST TERR.	Population	116149 (1.00)	*	*	*	*	*	*	*	*	*	*
	Land Area	533 (1.00)	*	*	*	*	*	*	*	*	*	*

REGION IX	Population	31504342 (1.00)	9874143 (.31)	5447048 (.17)	8475761 (.27)	3917593 (.12)	3789797 (.09)
	Land Area	386970 (1.00)	4518 (.01)	3883 (.01)	13087 (.03)	50440 (.13)	323363 (.84)

(xxx) Less than one percent

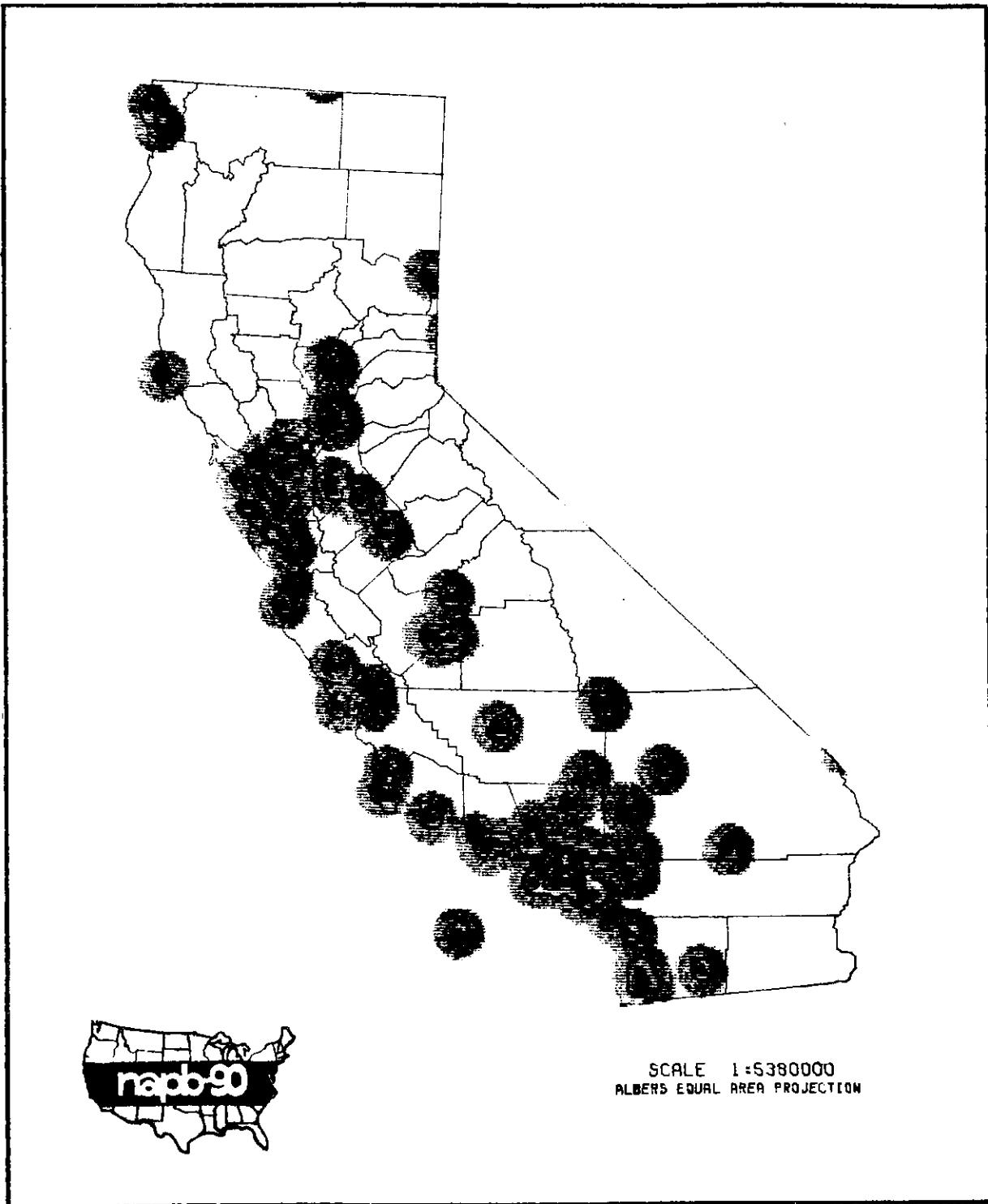
* Data will be made available separately



D I R E C T E F F E C T S R I S K A R E A S

F E M A R E G I O N I X - A R I Z O N A

Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



DIRECT EFFECTS RISK AREAS

FEMA REGION IX - CALIFORNIA

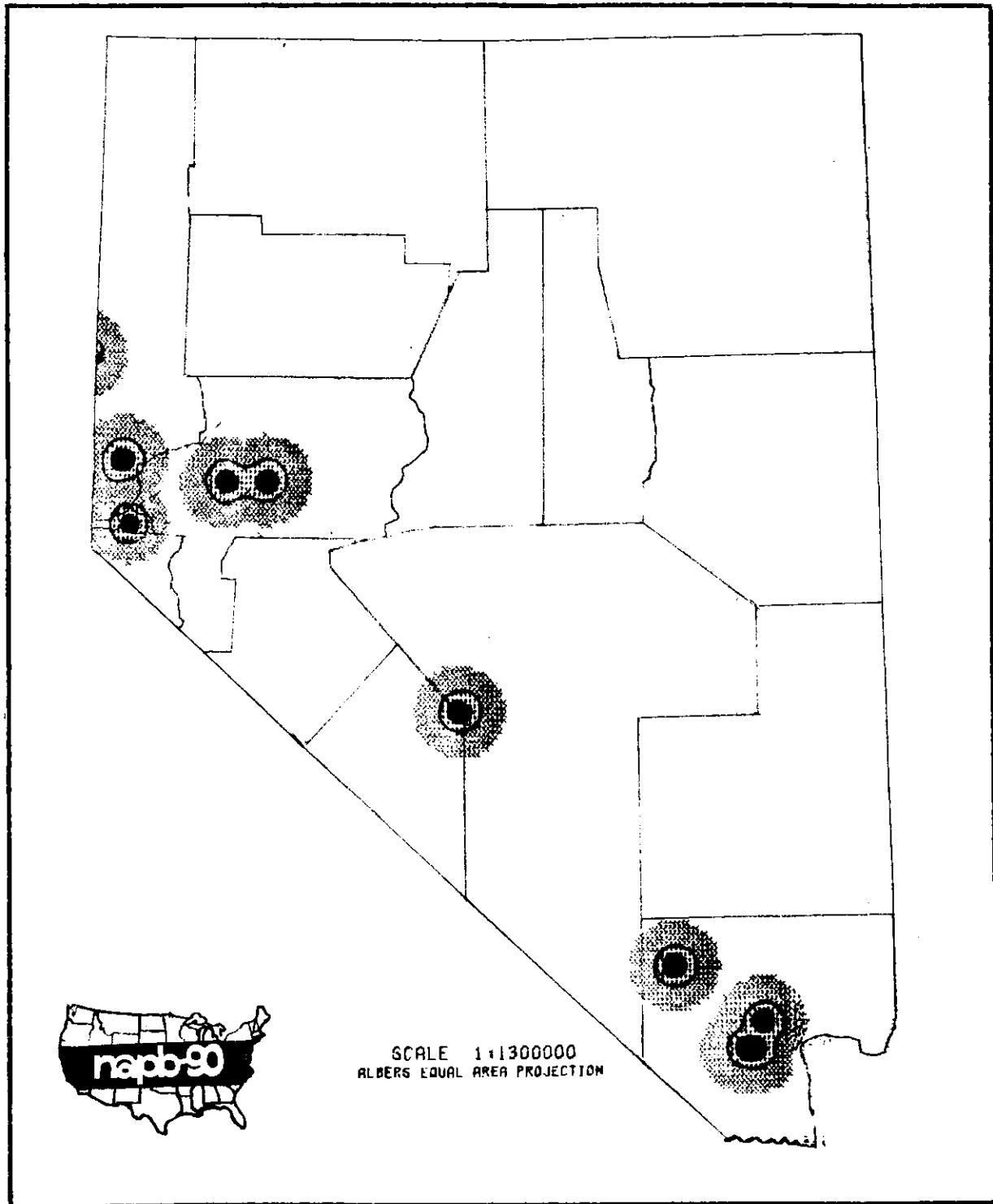
Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi

[MAP WILL BE FURNISHED SEPARATELY]

D I R E C T E F F E C T S R I S K A R E A S

F E M A R E G I O N I X - H A W A I I

- Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



D I R E C T E F F E C T S R I S K A R E A S

F E M A R E G I O N I X - N E V A D A

Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi

[MAP WILL BE FURNISHED SEPARATELY]

D I R E C T E F F E C T S R I S K A R E A S

FEMA REGION IX - AMERICAN SAMOA

Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi

[MAP WILL BE FURNISHED SEPARATELY]

D I R E C T E F F E C T S R I S K A R E A S

FEMA REGION IX - GUAM

Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi

[MAP WILL BE FURNISHED SEPARATELY]

D I R E C T E F F E C T S R I S K A R E A S

FEMA REGION IX - U.S. TRUST TERRITORY

- Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi

F E M A R E G I O N X - - D I R E C T E F F E C T S & F I R E R I S K S

STATE/DATA	TOTALS	VERY	HIGH	MEDIUM	LOW	NONE	
		GT 10 psi	5 to 10 psi	2 to 5 psi	.5 to 2 psi.	LT .5 psi	
ALASKA	Population Land Area	534271 (1.00) 570833 (1.00)	38557 (.08) * * *	54897 (.09) * * *	102153 (.19) * * *	55463 (.11) * * *	283201 (.53) * *
IDAHO	Population Land Area	1014218 (1.00) 82414 (1.00)	114528 (.11) 90 (xxx)	74583 (.07) 259 (xxx)	108834 (.11) 836 (.01)	126655 (.13) 5110 (.06)	589618 (.58) 76119 (.92)
OREGON	Population Land Area	2683926 (1.00) 96187 (1.00)	351689 (.13) 317 (xxx)	162186 (.06) 318 (xxx)	369500 (.14) 1375 (.01)	527477 (.20) 6375 (.07)	1273074 (.40) 87802 (.91)
WASHINGTON	Population Land Area	4402272 (1.00) 66512 (1.00)	1049095 (.24) 957 (.01)	516498 (.12) 937 (.01)	809564 (.18) 3618 (.05)	1239731 (.05) 15384 (.23)	787384 (.18) 45616 (.69)
REGION X	Population Land Area	8634750 (1.00) 815946 (1.00)	1553869 (.18) 1364 (xxx)	808164 (.09) 1514 (xxx)	1390051 (.16) 5829 (.01)	1949326 (.23) 26869 (.03)	2933340 (.34) 780370 (.96)

(xxx) Less than 1 percent

* Data will be made available separately

[MAP WILL BE FURNISHED SEPARATELY]

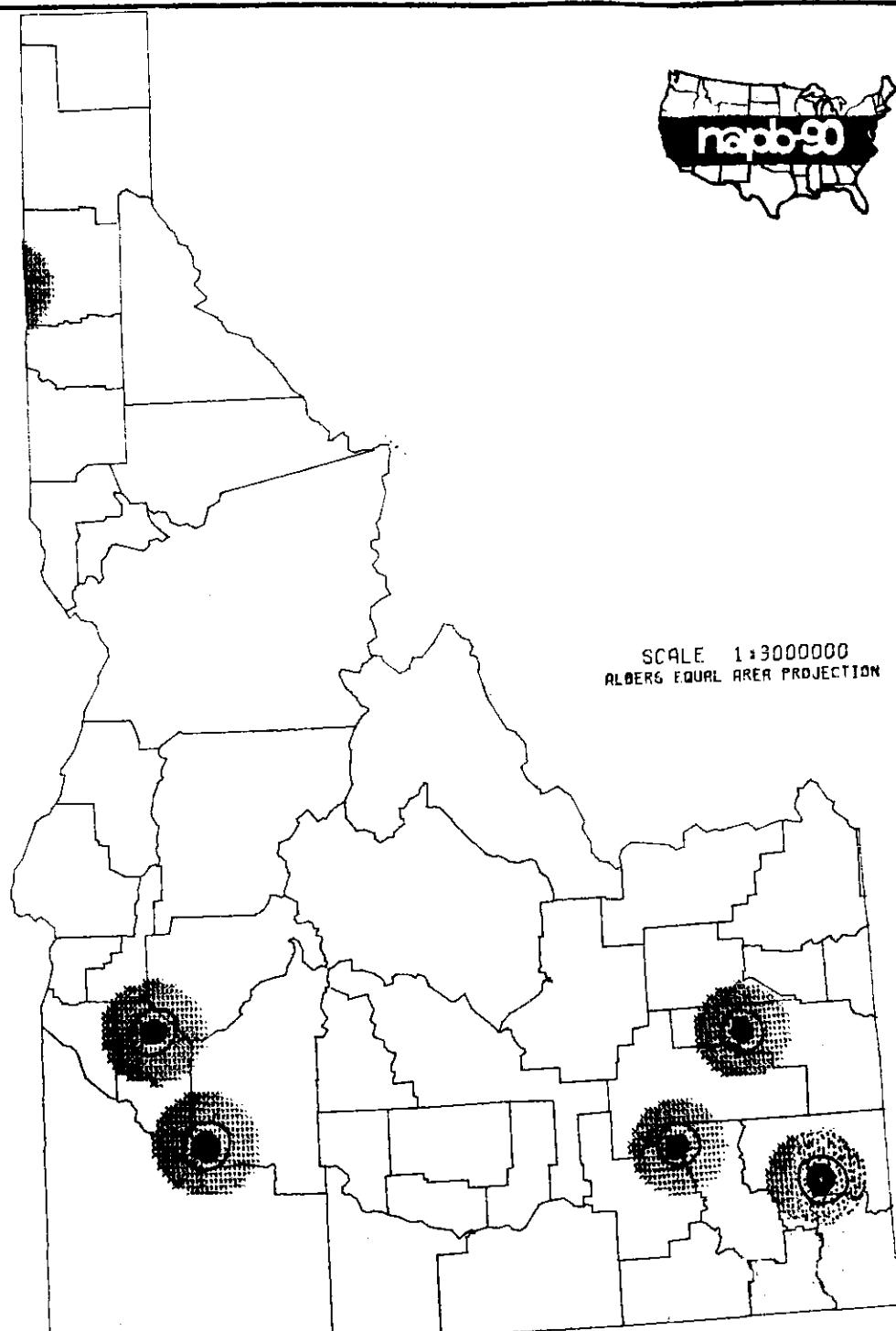
D I R E C T E F F E C T S R I S K A R E A S

FEMA REGION X - ALASKA

Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



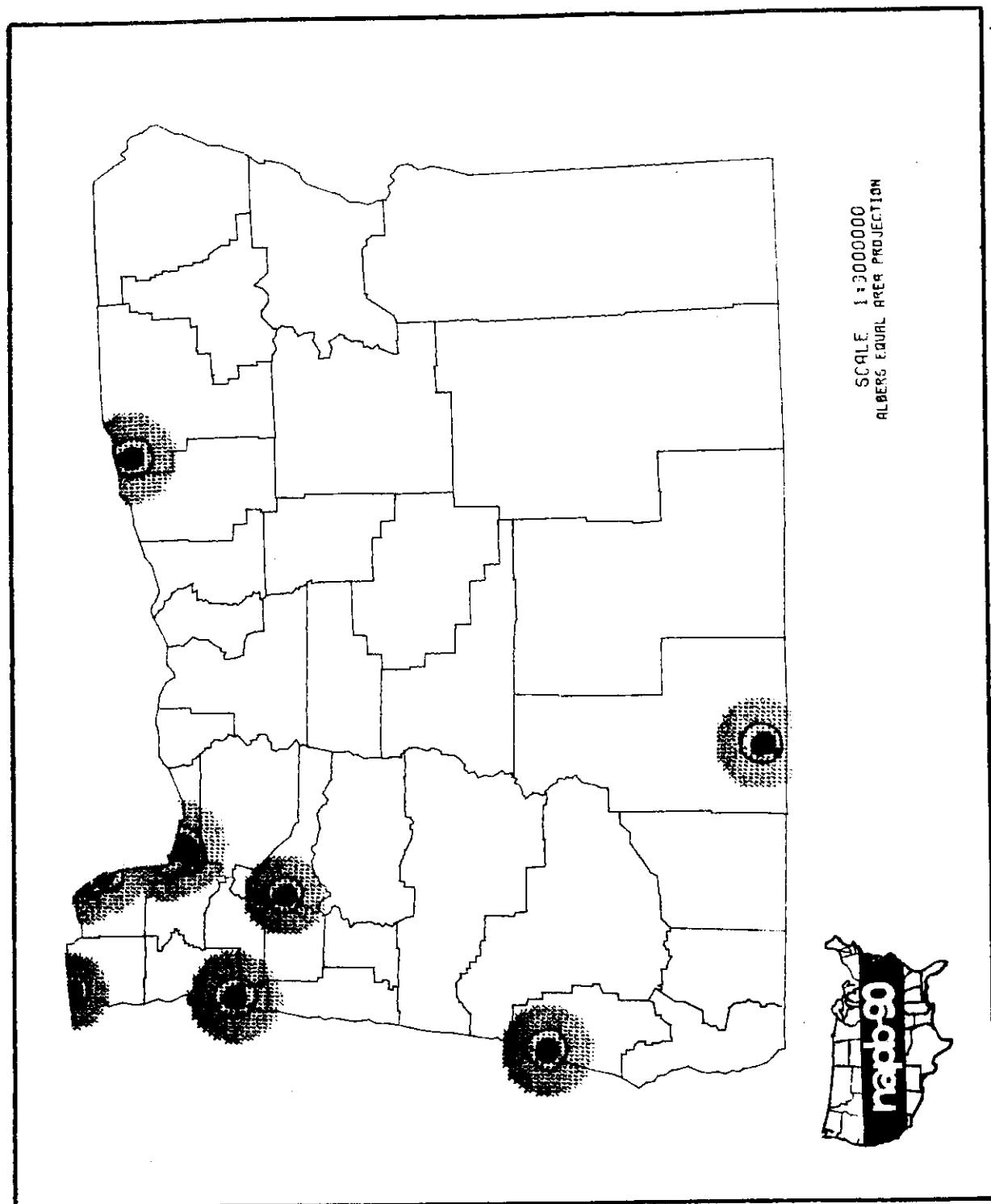
SCALE 1:3000000
ALBERS EQUAL AREA PROJECTION



DIRECT EFFECTS RISK AREAS

FEMA REGION X - IDAHO

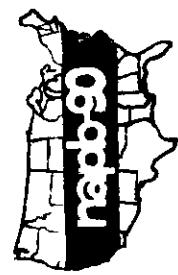
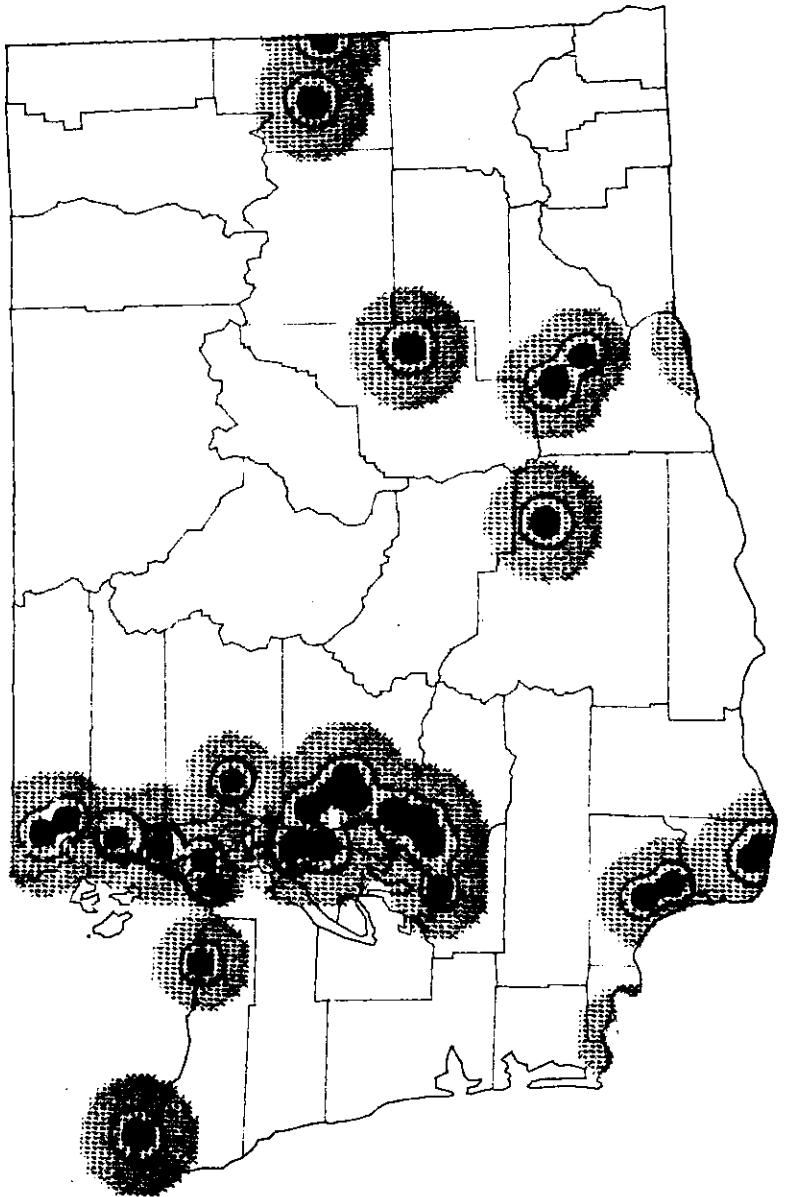
- Black Area: Equal to or greater than 5.0 psi
- Ringed Area: Equal to or greater than 2.0 psi
- Unringed Area: Equal to or greater than 0.5 psi



DIRECT EFFECTS RISK AREAS

FEMA REGION X - OREGON

Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



D I R E C T E F F E C T S R I S K A R E A S

F E M A R E G I O N X - W A S H I N G T O N

- Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi

A N N E X A - D I R E C T E F F E C T S & F I R E R I S K S

PART 2. HIGHEST RISK LEVEL RECORDED WITHIN COUNTIES

This part shows county resident population and land area under direct effects and fire risk based upon the highest risk level recorded within the county, regardless of the actual area covered by blast. This data also includes counties which are "risk free" from blast overpressures, i.e., counties which have no blast overpressure or have blast overpressure less than 0.5 psi.

A N N E X A - D I R E C T E F F E C T S & F I R E R I S K

PART 2. TABLE OF CONTENTS

NATIONAL Blast and Fire Risk Summary	A- 85
REGION I Blast and Fire Risk Summary	A- 87
Connecticut	A- 89
Maine	A- 91
Massachusetts	A- 93
New Hampshire	A- 95
Rhode Island	A- 97
Vermont	A- 99
REGION II Blast and Fire Risk Summary	A- 101
New Jersey	A- 103
New York	A- 105
Puerto Rico	A- 109
Territory of the Virgin Islands	A- 111
REGION III Blast and Fire Risk Summary	A- 113
Delaware	A- 115
District of Columbia	A- 117
Maryland	A- 119
Pennsylvania	A- 121
Virginia	A- 125
West Virginia	A- 131
REGION IV Blast and Fire Risk Summary	A- 135
Alabama	A- 137
Florida	A- 141
Georgia	A- 145
Kentucky	A- 151
Mississippi	A- 157
North Carolina	A- 161
South Carolina	A- 165
Tennessee	A- 167
REGION V Blast and Fire Risk Summary	A- 171
Illinois	A- 173
Indiana	A- 177
Michigan	A- 181
Minnesota	A- 185
Ohio	A- 189
Wisconsin	A- 193

PART 2. TABLE OF CONTENTS (Continued)

REGION VI Blast and Fire Risk Summary	A- 197
Arkansas	A- 199
Louisiana	A- 203
New Mexico	A- 207
Oklahoma	A- 209
Texas	A- 213
REGION VII Blast and Fire Risk Summary	A- 223
Iowa	A- 225
Kansas	A- 229
Missouri	A- 233
Nebraska	A- 239
REGION VIII Blast and Fire Risk Summary	A- 243
Colorado	A- 245
Montana	A- 249
North Dakota	A- 253
South Dakota	A- 255
Utah	A- 259
Wyoming	A- 261
REGION IX Blast and Fire Risk Summary	A- 263
Arizona	A- 265
California	A- 267
Hawaii	A- 271
Nevada	A- 273
American Samoa	A- 275
Guam	A- 277
Trust Territory	A- 289
REGION X Blast and Fire Risk Summary	A- 291
Alaska	A- 293
Idaho	A- 295
Oregon	A- 297
Washington	A- 299

NATIONAL DIRECT EFFECTS RISK SUMMARY

Estimated 1985 Population: 242,109,419
 Land Area: 3,551,226 square miles

FEMA REGION	VERY HIGH RISK			HIGH RISK			MEDIUM RISK			LOW/NO* RISK			
	GT 10 PSI		POPULATION AREA	EQ/GT 5PSI LT 10PSI POPULATION AREA		POPULATION AREA	EQ/GT 2PSI LT 5PSI POPULATION AREA		POPULATION AREA	EQ/GT • 5PSI LT 2PSI POPULATION AREA		POPULATION AREA	
	Region I	9 397	810	22 101	206	694	4 540	1 025	945	3 408	1 816	758	31 633
Region II	19 525	466	18 641	5 734	729	3 850	998	669	9 112	(1 127	971	21 945)*	
Region III	18 606	721	43 296	825	473	6 116	1 790	474	13 521	3 838	890	57 614	
Region IV	22 990	579	83 093	976	474	11 723	2 403	465	25 471	(2 307	493	31 393)	
Region V	26 087	828	66 623	1 254	413	6 384	4 011	018	28 005	(1 531	397	26 224)*	
Region VI	18 774	323	125 298	237	848	5 128	1 653	608	38 036	7 474	583	380 121	
Region VII	5 647	754	42 351	379	225	6 244	951	181	10 350	(2 847	548	98 679)	
										(4 627	035	281 442)*	
										(1 054	037	41 287)	
										(3 913	043	182 739)*	

* Less than 0.5 psi overpressure

NATIONAL DIRECT EFFECTS RISK SUMMARY (Continued)

FEMA REGION	POPULATION AREA	HIGH RISK			MEDIUM RISK			LOW/NO* RISK		
		GT 10 PSI	EQ/GT 5PSI LT 10PSI POPULATION AREA	EQ/GT 2PSI LT 5PSI POPULATION AREA	EQ/GT 2PSI LT 5PSI POPULATION AREA	EQ/GT .5PSI LT 2PSI POPULATION AREA	EQ/GT .5PSI LT 2PSI POPULATION AREA	EQ/GT 2PSI LT 5PSI POPULATION AREA	EQ/GT .5PSI LT 2PSI POPULATION AREA	EQ/GT .5PSI LT 2PSI POPULATION AREA
Region VIII	4 772 181 192 611	469 653	13 816	132 289	25 513	1 944	608	341 557		
						(683	017	69 607)		
Region IX	27 408 451 191 318	---	---	1 354 248	24 772	(1 261	591	271 950)*		
						(785	485	34 838)		
Region X	5 245 042 62 730	67 460	1 209	701 483	10 305	(634	839	129 102)*		
						(653	506	35 725)		
						(1 432	988	134 649)*		
NATIONAL	158 456 155 848 062	10 151 969	59 010	15 022 380	188 493	58 478	645	2 455 661		
						(22 198	278	499 814)		
						(36 280	367	1 956 847)*		

*Less than .5 psi overpressure

F E M A R E G I O N I - - D I R E C T E F F E C T S R I S K S U M M A R Y

Estimated 1985 Population: 12,320,207
 Land Area: 61,682 square miles

STATE	POPULATION AREA	HIGH RISK			MEDIUM RISK			LOW/NO* RISK		
		GT 10 PSI	EQ/GT 5PSI	LT 10PSI	EQ/GT 2PSI	LT 5PSI	POPULATION AREA	POPULATION AREA	EQ/GT • 5PSI	LT 2PSI
Connecticut	2 775 954	3 062	---	---	---	---	---	389 507	1 810	(389 507 1 810)*
Maine	637 184	12 292	18 065	3 986	100 112	477	(405 517 14 240	(230 026 7 074)	(175 491 7 166)*)
Massachusetts	4 630 548	3 604	141 781	528	655 822	1 514	(75 324 851	(69 254 804)	(6 070 47)*)
New Hampshire	311 943	1 575	---	---	197 424	1 306	(7 481 070 6 111	(6 070 47)*	(481 070 6 111)*)
Rhode Island	918 987	1 028	46 848	26	---	---	---	---	---)
Vermont	123 194	540	---	---	72 587	1 511	(338 704 7 221	(338 704 7 221)*	(338 704 7 221)*)
TOTAL REGION I	9 397 810	22 101	206 694	4 540	1 025 945	3 408	1 816 758	31 633	(688 787 9 688)	(1 127 971 21 945)*

* Less than .5 psi overpressure

S T A T E O F C O N N E C T I C U T - - D I R E C T E F F E C T S R I S K

Estimated 1985 Population: 3,165,461
 Land Area: 4,872 square miles

C O U N T Y	P O P U L A T I O N	A R E A	V E R Y H I G H R I S K			H I G H R I S K			M I D I U M R I S K			L O W / N O * R I S K		
			G T 10 P S I	E Q / G T 5 P S I	L T 1 0 P S I	E Q / G T 2 P S I	L T 5 P S I	A R E A	P O P U L A T I O N	A R E A	P O P U L A T I O N	A R E A	P O P U L A T I O N	A R E A
Fairfield	818	293	632											
Hartford	819	457	739											
Litchfield														
Middlesex														
New Haven	771	603	610											
New London	246	137	669											
Tolland	120	464	412											
Windham														
T O T A L S T A T E	2 775	954	3 062	----	----	----	----	----	-----	-----	389	507	1 810	
											(389	507	1 810)
											{	---	---)*

* Less than .5 psi overpressure

STATE OF MAINE -- DIRECT EFFECTS RISK

Estimated 1985 Population: 1,160,878
 Land Area: 30,995 square miles

COUNTY	POPULATION AREA	POPULATION AREA	VERY HIGH RISK	HIGH RISK	MEDIUM RISK	LOW/NO* RISK
			GT 10 PSI	EQ/GT 5PSI LT 10PSI	EQ/GT 2PSI LT 5PSI	EQ/GT .5PSI LT 2PSI
Androscoggin	88 277	6 721	100 112	477
Aroostook	225 058	876				
Cumberland	29 408	1 699*
Franklin	43 805	1 537
Hancock
Kennebec	112 723	876
Knos	34 496	370*
Lincoln	27 958	458*
Oxford	138 771	3 430	49 771	2 053*
Penobscot
Piscataquis	18 065	3 986
Sagadahoc	30 689	257	46 806	3 931
Somerset	26 692	730
Waldo	33 858	2 586*
Washington
York	154 389	1 008

STATE TOTAL	637 184	12 292	18 065	3 986	100 112	477	405 517	14 240
							(230 026	7 074)*
							(175 491	7 166)*

* Less than .5 psi overpressure

THE MASSACHUSETTS DIRECT EFFECTS RISKS

Estimated 1985 Population: 5,503,475
Land Area: 6,497 square miles

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW/NO* RISK	
	POPULATION AREA	GT 10 PSI	POPULATION AREA	EQ/GT 5PSI LT 10PSI	POPULATION AREA	EQ/GT 2PSI LT 5PSI	POPULATION AREA	EQ/GT • 5 PSI LT 2PSI
Barnstable	147	925	400					
Berkshire	145	110	929					
Bristol	478	662	557					
Dukes	•••••	•••••	•••••	•••••	•••••	•••••	•••••	10 337 102
Essex	648	793	495					
Franklin	•••••	•••••	•••••	•••••	•••••	•••••	•••••	64 987 702
Hampden	442	601	618					
Hampshire	•••••	•••••	•••••	141	781	528		
Middlesex	1 369	905	822					
Nantucket	•••••	•••••	•••••	•••••	•••••	•••••	•••••	6 070 47*
Norfolk	602	837	400					
Plymouth	420	708	655					
Suffolk	660	972	57					
Worcester	•••••	•••••	•••••	•••••	•••••	•••••	•••••	655 822 1 514
TOTAL STATE	4 630	548	3 604	141 781	528	655 822	1 514	75 324 851

*Less than .5 psi overpressure

S T A T E O F N E W H A M P S H I R E - - D I R E C T E F F E C T S R I S K

Estimated 1985 Population: 990,437
 Land Area: 8,992 square miles

COUNTY	POPULATION AREA	HIGH RISK GT 10 PSI	EQ/GT 5PSI LT 10PSI	MEDIUM RISK EQ/GT 2PSI LT 5PSI	LOW/NO* RISK EQ/GT • 5PSI LT 2PSI	
					POPULATION AREA	POPULATION AREA
Belknap	•••••	•••••	•••••	•••••	•••••	•••••
Carroll	•••••	•••••	•••••	•••••	•••••	•••••
Cheshire	•••••	•••••	•••••	•••••	•••••	•••••
Coos	•••••	•••••	•••••	•••••	•••••	•••••
Grafton	•••••	•••••	•••••	•••••	•••••	•••••
Hillsborough	299 744	876	•••••	103 605	936	•••••
Merrimack	•••••	•••••	•••••	•••••	•••••	•••••
Rockingham	212 199	699	•••••	93 819	370	•••••
Strafford	•••••	•••••	•••••	•••••	•••••	•••••
Sullivan	•••••	•••••	•••••	•••••	•••••	•••••
TOTAL STATE	311 943	1 575	---	197 424	1 306	(481 070 6 111)*
						(--- ---)

*Less than .5 psi overpressure

S T A T E O F R H O D E I S L A N D - - D I R E C T E F F E C T S R I S K

Estimated 1985 Population: 965,471
 Land Area: 1,054 square miles

COUNTRY	POPULATION AREA	EQ/GT 5PSI POPULATION AREA	HIGH RISK EQ/GT 10PSI POPULATION AREA	MEDIUM RISK EQ/GT 2PSI LT 5PSI POPULATION AREA	LOW/NO* RISK EQ/GT • 5PSI LT 2PSI POPULATION AREA	
			VERY HIGH RISK GT 10 PSI	HIGH RISK EQ/GT 5PSI LT 10PSI	EQ/GT 2PSI LT 5PSI	EQ/GT • 5PSI LT 2PSI
Bristol	46	484	26	
Kent	158	247	172			
Newport	84	236	107			
Providence	578	010	416			
Washington	98	494	333			
TOTAL STATE	918	987	1 028	46 484	26	---

* Less than .5 psi overpressure
 (---) *

S T A T E O F V E R M O N T - - D I R E C T E F F E C T S R I S K

Estimated 1985 Population: 534,485
 Land Area: 9,272 square miles

COUNTY	POPULATION AREA	POPULATION AREA	VERY HIGH RISK	HIGH RISK	MEDIUM RISK	EQ/GT 5PSI LT 10PSI POPULATION AREA	EQ/GT 2PSI LT 5PSI POPULATION AREA	EQ/GT • 5PSI LT 2PSI POPULATION AREA	LOW/NO* RISK
			GT 10 PSI	EQ/GT 5PSI LT 10PSI POPULATION AREA	EQ/GT 2PSI LT 5PSI POPULATION AREA				
Addison	31 248	773	34 937
Bennington	676*
Caledonia	651*
Chittenden	123 194	540
Essex	6 646 666*
Franklin	36 337	649
Grand Isle	5 002	89	17 676 461*
Lamoille	24 019 690*
Orange	23 993 697*
Orleans
Rutland	59 226 932*
Washington	53 831 690*
Windham	38 786 786*
Windsoor	53 112 972*

TOTAL STATE	123 194	540	---	---	72 587	1 511	(---)	(---)	(---)
-------------	---------	-----	-----	-----	--------	-------	---------	---------	---------

*Less than .5 psi overpressure

F E M A R E G I O N I I - - D I R E C T E F F E C T S R I S K S U M M A R Y

Estimated 1985 Population: 28,626,118
 Land Area: 58,436 square miles

STATE	POPULATION AREA	VERY HIGH RISK GP 10 PSI		HIGH RISK EQ/GT 5PSI LE 10PSI		MEDIUM RISK EQ/GT 2PSI LT 5PSI		LOW/NO* RISK EQ/GT •5PSI LT 2PSI	
		POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
New Jersey	4 794 644	4 986	2 316 996	769	439 521	1 713	(---)	(---)	(---)*
New York	14 730 822	13 655	3 427 733	3 081	559 148	7 399	2 943 560	23 242	(768 558 8 451) (175 002 14 791)*

Puerto Rico

DATA WILL BE FURNISHED SEPARATELY

Virgin Islands

DATA WILL BE FURNISHED SEPARATELY

TOTAL REGION II	19 525 466	18 641	5 734 729	3 850	998 669	9 112	943 560	23 242
							(768 558 8 451) (175 002 14 791)*	

*Less than .5 psi overpressure

STATE OF NEW JERSEY -- DIRECT EFFECTS RISK

Estimated 1985 Population: 7,551,161
Land Area: 7,468 square miles

COUNTY	POPULATION AREA	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		POPULATION AREA	EQ/GT 5PSI LT 10PSI POPULATION AREA	EQ/GT 2PSI LT 5PSI POPULATION AREA	EQ/GT •5PSI LT 2PSI POPULATION AREA	LOW/NO* RISK
		GT 10 PSI	POPULATION AREA	EQ/GT 5PSI LT 10PSI	POPULATION AREA	EQ/GT 2PSI LT 5PSI	POPULATION AREA					
Atlantic	202	977	568	843	976	237						
Bergen	•••••	•••••	•••••									
Burlington	382	675	808									
Camden	484	532	223									
Cape May	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	90	810	263	
Cumberland	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	133	582	498	
Essex	•••••	•••••	•••••	826	857	127						
Gloucester	209	076	327									
Hudson	•••••	•••••	•••••	560	606	46						
Hunterdon	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	93	887	427	
Mercer	315	518	227									
Middlesex	623	943	316									
Monmouth	530	780	472									
Morris	420	366	471									
Ocean	382	488	641									
Passaic	457	120	187									
Salem	66	592	338									
Somerset	212	791	305									
Sussex	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	121	242	525	
Union	505	786	103									
Warren	•••••	•••••	•••••	85	557	359						
STATE TOTAL	4 794	644	4 986	2 316	996	769	439	521	1 713	(---)	(---)	(---)*
				*Less than .5 psi overpressure								

STATE OF NEW YORK -- DIRECT EFFECTS RISK

Estimated 1985 Population: 17,774,143
 Land Area: 47,377 square miles

COUNTY	POPULATION AREA	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW/NO* RISK	
		GT 10 PSI	EQ/GT 5PSI LT 10PSI	POPULATION AREA	POPULATION AREA	EQ/GT 2PSI LT 5PSI	POPULATION AREA	EQ/GT .5PSI LT 2PSI	POPULATION AREA
Albany	285 433	524	80 381	695	51 343	1 032*
Allegany	1 173 939	42	146 038	1 064	213 451	712*
Bronx
Broome
Cattaraugus	86 102	1 306
Cayuga	80 381	695	50 447	897*
Chautauqua	146 038	1 064	92 406	411*
Chemung
Chenango	80 924	1 043
Clinton
Columbia	61 646	638	47 988	500*	46 664
Cortland	1 440*
Delaware
Dutchess	255 073	804
Erie	977 687	1 046
Essex	36 733	1 807	43 604	1 642*
Franklin	56 407	497
Fulton	56 691	495*
Genesee	41 477	648
Greene
Hamilton	4 806	1 721
Herkimer	67 691	1 417
Jefferson	89 068	1 273
Kings	2 259 554	70	24 945	1 283
Lewis

*Less than .5 psi overpressure

STATE OF NEW YORK (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA
				POPULATION
Livingston	58 866 633
Madison	67 406 656
Monroe	713 316	663	53 004 404
Montgomery
Nassau	1 342 306	287
New York	1 463 052	22
Niagara	217 492	526
Oneida	253 963	1 219
Onondaga	464 441	785	92 890	644
Ontario
Orange	276 972 826*
Orleans	120 383	954	39 425 391*
Oswego
Otsego	59 978 1 004
Putnam	81 774 231*
Queens	1 916 194	108
Rensselaer	152 266	655
Richmond	375 223	59
Rockland	265 505 175
St Lawrence	113 496 2 728*
Saratoga	161 216	810
Schenectady	151 139	206
Schoharie	30 392 624
Schuyler	17 721 329
Seneca	32 754	327

*Less than .5 psi overpressure

STATE OF NEW YORK (Continued)

COUNTY	VERY HIGH RISK			HIGH RISK			MEDIUM RISK			LOW/NO* RISK		
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Steuben	1 322	809	912								99 365	1 396*
Suffolk											67 719	976*
Sullivan											50 776	519*
Tioga											88 051	477
Tompkins												
Ulster	55 645	882		163 741	1 131							
Warren							56 349	836				
Washington							88 815	603				
Wayne	866	945	438									
Westchester												
Wyoming											40 761	595*
Yates							21 495	339				
TOTAL STATE	14 730	822	13 655	3 427	733	3 081	559 148	7 399	943 560	23 242		
									(768 558	8 451)		
									(175 002	14 791)*		

*Less than .5 psi overpressure

T E R R I T O R Y O F P U E R T O R I C O - - D I R E C T E F F E C T S R I S K

Estimated 1985 Population: 3,196,520
Land Area: 3,459 square miles

COUNTRY	POPULATION AREA	HIGH RISK GT 10 PSI	EQ/GT 5PSI LT POPULATION AREA	MEDIUM RISK EQ/GT 2PSI LT POPULATION AREA	EQ/GT .5PSI LT POPULATION AREA	LOW/NO* RISK
						EQ/GT .5PSI LT POPULATION AREA

DATA WILL BE FURNISHED SEPARATELY

All Counties

TOTAL TERRITORY

(
)*

*Less than .5 psi overpressure

T E R R I T O R Y O F T H E V I R G I N I S L A N D S - - D I R E C T E F F E C T S R I S K

Estimated 1985 Population: 104,294
Land Area: 132 square miles

C O U N T Y	P O P U L A T I O N A R E A	V E R Y H I G H R I S K	H I G H R I S K	M E D I U M R I S K	L O W / N O * R I S K			
		G T 10 P S I	E Q / G T 5 P S I	L T 10 P S I	E Q / G T 2 P S I	L T 5 P S I	E Q / G T . 5 P S I	L T 2 P S I

All Counties

DATA WILL BE FURNISHED SEPARATELY

TOTAL TERRITORY

(
)
)*

*Less than .5 psi overpressure

F E M A R E G I O N I I I - - D I R E C T E F F E C T S R I S K S U M M A R Y

Estimated 1985 Population: 25,107,876
 Land Area: 120,550 square miles

STATE	POPULATION AREA	HIGH RISK GT 10 PSI	EQ/GT 5PSI LT 10PSI	MEDIUM RISK EQ/GT 2PSI LT 5PSI	LOW/NO* RISK EQ/GT • 5PSI LT 2PSI	POPULATION AREA	
						POPULATION AREA	POPULATION AREA
Delaware	425 022	991	---	---	---	105 207	942
Dist. of Columbia	618 906	63	---	---	---	(105 207	942)*
Maryland	3 863 638	5 462	246 820	703	46 396	871	224 889 2 802
Pennsylvania	9 115 680	20 270	338 141	1 033	1 186 856	6 535	(105 974 1 609)
Virginia	3 482 624	8 573	201 907	3 847	379 967	3 964	(118 915 1 193)*
West Virginia	1 100 851	7 937	38 605	533	159 255	2 151	(297 736 6 172)*
TOTAL REGION	18 606 721	43 296	825 473	6 116	1 790 474	13 521	3 838 890 57 614

(2	307	493	31 393)
(1	531	397	26 224)*

*Less than .5 psi overpressure

S T A T E O F D E L A W A R E - - D I R E C T E F F E C T S R I S K

Estimated 1985 Population: 530,229
Land Area: 1,933 square miles

COUNTY	HIGH RISK			MEDIUM RISK			LOW/NO* RISK		
	GT 10 PSI	EQ/GT 5PSI	LT 10PSI	EQ/GT 2PSI	LT 5PSI	EQ/GT .5PSI	LT 2PSI	POPULATION AREA	POPULATION AREA
Kent	15	037	595	---	---	---	---	105	207
New Castle	409	985	396	-----	-----	-----	-----	()
Sussex	()
TOTAL STATE	425	022	991	---	---	---	---	105	207
								(942)*

*Less than .5 psi overpressure

D I S T R I C T O F C O L U M B I A - - D I R E C T E F F E C T S R I S K

COUNTRY	POPULATION AREA	POPULATION AREA	VERY HIGH RISK	HIGH RISK	MEDIUM RISK	LOW/NO* RISK
			GT 10 PSI	EQ/GT 5PSI LT 10PSI	EQ/GT 5PSI LT 2PSI	EQ/GT •5PSI LT 2PSI
Dist. of Columbia	618 906	63	---	---	---	(---)*
TOTAL DISTRICT	618 906	63	---	---	---	(---)

*Less than .5 psi overpressure

STATE OF MARYLAND -- DIRECT EFFECTS RISK

Estimated 1985 Population: 4,381,743
 Land Area: 9,838 square miles

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW/NO* RISK	
	GT 10 PSI POPULATION AREA	EQ/GT 5PSI LT POPULATION AREA	EQ/GT 5PSI LT POPULATION AREA	EQ/GT 2PSI LT POPULATION AREA	EQ/GT 5PSI LT POPULATION AREA			
Allegany	76 002	421						
Anne Arundel	393 425	419						
Baltimore	677 372	598						
Calvert	40 418	213						
Caroline	23 715	321
Carroll	106 853	452				
Cecil	66 776	359						
Charles	84 030	452						
Dorchester	29 717	593				
Frederick	126 295	663						
Garrett	26 913	657
Harford	152 156	447						
Howard	139 967	251				
Kent	16 679	278			
Montgomery	635 241	495						
Prince Georges	678 149	487						
Queen Annes	28 229	372
St Marys	64 355	373						
Somerset	18 515	339*
Talbot	27 117	259
Washington	111 651	455						
Wicomico	66 361	379*
Worcester	34 039	475*
Baltimore City	757 768	80						
TOTAL STATE	3 863 638	5 462	246 820	703	46 396	871	224 889	2 802

* Less than .5 psi overpressure

(105 974 1 609)
 (118 915 1 193)*

STATE OF PENNSYLVANIA - - DIRECT EFFECTS RISK

Estimated 1985 Population: 11,909,083
 Land Area: 44,892 square miles

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW/NO* RISK	
	GT 10 PSI	POPULATION AREA	EQ/GT 5PSI LT POPULATION AREA	10PSI POPULATION AREA	EQ/GT 2PSI LT POPULATION AREA	5PSI POPULATION AREA	EQ/GT .5PSI LT POPULATION AREA	2PSI POPULATION AREA
Adams	68	459	521					
Allegheny	1 399	652	727					
Armstrong	83	324	646					
Beaver	197	808	436					
Bedford								
Berks	318	305	861					
Blair								
Bradford								
Bucks	515	874	610					
Butler	152	040	789					
Cambria								
Cameron								
Carbon	54	170	385					
Centre	114	856	1 106					
Chester	339	008	758					
Clarion	42	996	607					
Clearfield								
Clinton								
Columbia	61	778	486					
Crawford								
Cumberland	186	988	547					
Dauphin	236	650	528					
Delaware	550	418	184					
Elk								
Erie	282	674	804					

* Less than .5 psi overpressure

STATE OF PENNSYLVANIA (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA
Fayette	159 070	794	5 018 428*
Forest	13 721 437
Franklin	116 866	774	
Fulton	
Greene	41 362	577	
Huntingdon	42 811 877
Indiana	93 550	829	
Jefferson	49 051	656	
Juniata	19 980 392*
Lackawanna	222 969	461	
Lancaster	386 020	952	105 403 363	
Lawrence	
Lebanon	277 519	348	111 919 363
Lehigh	334 652 891	
Luzerne	
Lycoming	116 783	1 237	
McKean	48 882	979	126 574 672	
Mercer	
Mifflin	79 149 609	
Monroe	
Montgomery	662 853	486	17 066 131
Montour	
Northampton	232 130	376	
Northumberland	100 144 461
Perry	38 081 557	
Philadelphia	1 636 321	136	
Pike	21 143 551*
Potter	158 879 781	18 490 1 081*
Schuylkill	
Snyder	35 824 329*

*Less than .5 psi overpressure

STATE OF PENNSYLVANIA (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA		HIGH RISK POPULATION AREA		MEDIUM RISK POPULATION AREA		LOW/NO* RISK POPULATION AREA	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Somerset	***	***	***	***	82	007	1	073
Sullivan	***	***	***	***	***	***	6	159
Susquehanna	***	***	***	***	***	***	39	233
Tioga	***	***	***	***	***	***	40	093
Union	***	***	***	***	***	***	33	796
Venango	64	445	679					
Warren	47	707	885					
Washington	***	***	***	***	217	162	858	
Wayne	***	***	***	***	38	414	731	
Westmoreland	***	***	***	385	141	1	033	
Wyoming	***	***	***	***	***	***	27	557
York	324	687	906					399

TOTAL STATE	9	115	680	20	270	338	141	1	033	1	186	856	6	535	1	268	406	17	054
															(960	670	10	882)

*Less than .5 psi overpressure

(297 736 6 172)*

STATE OF VIRGINIA -- DIRECT EFFECTS RISK

Estimated 1985 Population: 5,715,659
 Land Area: 39,700 square miles

COUNTY	VERY HIGH RISK			HIGH RISK			MEDIUM RISK			LOW/NOT RISK		
	GT 10 PSI	GT 5PSI	LT 10PSI	EQ/GT 2PSI	LT 5PSI	EQ/GT 2PSI	POPULATION AREA	POPULATION AREA	POPULATION AREA	EQ/GT 5PSI	LT 2PSI	POPULATION AREA
Accomack	30 877	476	59 605	725
Albemarle	13 541	446
Alleghany	8 247	357
Amelia
Amherst	29 207	478
Appomattox	12 380	336
Arlington	154 597	26
Augusta	54 869	989	5 302	537*
Bath	37 379	747
Bedford	6 584	359
Bland
Botetourt	23 987	545	16 369	563
Brunswick	37 878	504*
Buchanan	11 972	583*
Buckingham
Campbell	46 194	505
Caroline	18 878	536
Carroll	28 517	478
Charles City	6 751	181
Charlotte	11 840	476*
Chesterfield	164 500	434
Clarke	10 212	178
Craig	4 029	330
Culpeper	23 367	382
Cumberland	7 883	300*

*Less than .5 psi overpressure

STATE OF VIRGINIA (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LO/NO* RISK POPULATION AREA
Dickenson	20 223
Dinwiddie	21 091 507	331*
Essex	8 754 263*
Fairfax	692 187 393	
Fauquier	40 110 651	
Floyd	11 749 381	
Fluvanna	10 519	290*
Franklin	37 107	683
Frederick	35 630	415
Giles	17 799 362	
Gloucester	25 841	225
Goochland	12 676	281
Grayson	16 832	446*
Greene	8 522	157*
Greenville	10 082	300*
Halifax	29 663 816	
Hanover	52 693 468	
Henrico	195 226 238	
Henry	56 311	382*
Highland	2 797	416*
Isle of Wight	25 553 319	
James City	25 364 153	5 897	317*
King & Queen	11 204	180
King George	9 888	278
King William	
Lancaster	10 760	133*
Lee	27 010	437*
Loudoun	63 985 521	
Louisa	19 918 497	
Lunenburg	12 155	432

*Less than .5 psi overpressure

STATE OF VIRGINIA (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA
Madison	10 609	322*
Mathews	8 623	87
Mecklenburg	27 798	616*
Middlesex	8 286	134*
Montgomery	65 379	390
Nelson	12 336	475
New Kent	10 111
Northhampton	14 097	226
Northumberland	9 918
Nottoway	14 182	317	185*
Orange	19 053	342
Page	19 593	313*
Patrick	17 739	481
Pittsylvania	66 604	995
Powhatan	13 752	261
Prince Edward	16 928	354
Prince George	26 007	266
Prince William	169 165	339
Pulaski	34 978	318
Rappahannock	6 117	267
Richmond	6 816	193*
Roanoke	74 101	251
Rockbridge	18 123	603
Rockingham	53 179	865
Russell	33 140	479
Scott
Shenandoah	28 403	512*
Smyth	33 437	452*
Southampton	36 716	404	19 089
Spotsylvania	603*

*Less than .5 psi overpressure

STATE OF VIRGINIA (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA
Stafford	6 288	281	48 799	271
Surry	•••••	•••••	•••••	10 226
Sussex	•••••	51 785	520	492
Tazewell	•••••	•••••	•••••	22 363
Warren	•••••	•••••	•••••	217*
Washington	•••••	•••••	•••••	47 631
Westmoreland	•••••	•••••	•••••	14 279
Wise	•••••	•••••	•••••	45 748
Wythe	•••••	•••••	•••••	405*
York	40 171	113	•••••	25 624
INDEPENDENT CITIES				
Alexandria	107 977	15	•••••	463*
Bedford	•••••	•••••	•••••	6 277
Bristol	•••••	•••••	•••••	18 401
Buena Vista	•••••	•••••	•••••	6 414
Charlottesville	•••••	•••••	•••••	3*
Chesapeake	128 906	340	•••••	405*
Clifton Forge	•••••	•••••	17 613	7 175
Colonial Heights	•••••	•••••	8	44 426
Covington	•••••	•••••	•••••	17*
Danville	•••••	•••••	•••••	4 822
Emporia	•••••	•••••	•••••	2*
Fairfax	•••••	•••••	20 471	6
Falls Church	•••••	9 547	2	7 175
Franklin	•••••	•••••	•••••	19 356
Fredericksburg	•••••	•••••	•••••	6 507
Galax	•••••	•••••	•••••	8*
Hampton	126 828	51	•••••	26 543
Harrisonburg	•••••	24 495	10	6 774
Hopewell	•••••	•••••	•••••	2*
Lexington	•••••	•••••	•••••	•••••

*Less than .5 psi overpressure

STATE OF VIRGINIA (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA
Lynchburg	67 430	49		
Manassas		25 643 8
Manassas Park		6 524 2*
Martinsville		18 264 11*
Newport News	159 965	65		
Norfolk	282 850	53		
Norton		4 446 7*
Petersburg	40 714	23		
Poquoson	10 073	17		
Portsmouth	108 802	30		
Radford	13 415	7		
Richmond	219 010	60		
Roanoke	100 799 43	24 293 14
Salem	7 353 5*
South Boston	
Staunton	
Suffolk	49 070 409	21 871 8
Virginia Beach	320 264	256		
Waynesboro	15 194	8		
Williamsburg	11 161 5	
Winchester	20 561 9

TOTAL STATE	3 482 624	8 573	201 907 3 847	379 967 3 964	1 650 843 23 316
					(882 245 12 762)
					(768 598 10 554)*

*Less than .5 psi overpressure

STATE OF WEST VIRGINIA -- DIRECT EFFECTS RISK

Estimated 1985 Population: 1,952,256
 Land Area: 24,124 square miles

COUNTY	POPULATION AREA	HIGH RISK			MEDIUM RISK			LOW/NO* RISK		
		GT 10 PSI	EQ/GT 5PSI LT 10PSI	POPULATION AREA	EQ/GT 2PSI LT 5PSI	POPULATION AREA	EQ/GT .5PSI LT 2PSI	POPULATION AREA	EQ/GT .5PSI LT 2PSI	POPULATION AREA
Barbour	50	737	322	16	575	343	30	926
Berkeley	14	867
Boone	503	513*
Braxton	29	855	90
Brooke
Cabell	105	480	282	8	754
Calhoun	280*	280*
Clay	11	636	346	7	728
Doddridge	56	777
Fayette	667	667
Gilmer	8	570
Grant	10	700	480	340*	340*
Greenbrier	36	418	1 025
Hampshire	16	044
Hancock	39	360	85	644*
Hardy	10	750
Harrison	77	827	417	26	271
Jackson	464	464
Jefferson	32	646	209
Kanawha	225	530	901
Lewis	18	828
Lincoln	23	898	439	389	389
Logan	51	109
McDowell	46	772	535	456*	456*
Marion	64	570	312

* Less than .5 psi overpressure

STATE OF WEST VIRGINIA (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA
Marshall	40 688	305		
Mason	26 520	433		
Mercer	74 229	420		
Mineral	27 657	329		
Mingo	38 728	424*
Monongalia	78 079	363
Monroe	13 156	473
Morgan	11 225	230
Nicholas	27 964	650*
Ohio	60 308	106	
Pendleton	7 970	698*
Pleasants	7 959	131		
Pocahontas	9 687	942*
Preston	31 346	651
Putnam	40 735	346		
Raleigh	86 190	608
Randolph	29 608	1 040*
Ritchie	11 700	454
Roane	15 630	484	
Summers	15 424	353
Taylor	16 499	174	
Tucker	8 759	421
Tyler	11 013	258	
Upshur	24 904	355
Wayne	46 385	508		

*Less than .5 psi overpressure

STATE OF WEST VIRGINIA (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA
Webster	11 609 556*
Wetzel	22 106 359	
Wirt	5 281 235*
Wood	92 835 368	
Wyoming	35 334 502	
TOTAL STATE	1 100 851 7 937	38 605 533	159 255 2 151	653 545 13 503 (412 604 6 140) (240 941 7 363)*

* Less than .5 psi overpressure

F E M A R E G I O N I V - - D I R E C T E F F E C T S R I S K S U M M A R Y

Estimated 1985 Population: 42,442,705

Land Area: 379,046 square miles

STATE	POPULATION AREA	HIGH RISK			MEDIUM RISK			LOW/NO* RISK		
		GT 10 PSI	EQ/GT 5PSI	LT 10PSI	EQ/GT 2PSI	LT 5PSI	EQ/GT	•5PSI	LT	2PSI
Alabama	2 097 642	11 466	47 012	622	293 160	4 514	1 521	331	34	137
Florida	8 793 081	22 226	----	----	302 800	3 132	2 787	465	38	039
Georgia	3 233 308	9 311	371 511	4 297	395 251	4 824	1 929	163	39	685
Kentucky	1 555 778	7 020	106 002	936	312 507	2 083	1 755	859	29	550
Mississippi	1 034 591	8 037	39 226	1 093	149 393	3 214	1 393	923	34	830
North Carolina	2 342 278	10 017	----	----	809 177	4 625	3 082	319	34	201
South Carolina	1 384 092	8 113	199 592	2 058	32 178	1 145	1 727	560	18	891
Tennessee	2 459 809	6 849	213 131	2 717	108 999	1 934	1 674	577	29	430
TOTAL REGION IV	22 990 579	83 039	976 474	11 723	2 403 465	25 471	16 072	187	258	813
							(6 109	444	105	673)
							(9 962	743	153	140)

*Less than •5 psi overpressure

S T A T E O F A L A B A M A - - D I R E C T E F F E C T S R I S K

Estimated 1985 Population: 3,959,145
 Land Area: 50,739 square miles

COUNTY	POPULATION AREA	HIGH RISK			MEDIUM RISK			LOW/NO* RISK		
		GT 10 PSI	EQ/GT 5PSI LT 10PSI	EQ/GT 2PSI LT 5PSI	EQ/GT 2PSI LT 5PSI	EQ/GT *5PSI LT 2PSI	POPULATION AREA	POPULATION AREA	POPULATION AREA	POPULATION AREA
Autauga										
Baldwin										
Barbour										
Bibb										
Blount										
Bullock										
Butler										
Calhoun	127 200	611								
Chambers										
Cherokee										
Chilton										
Choctaw										
Clark										
Clay										
Cleburne										
Coffee	40 578	680								
Colbert										
Conecuh										
Coosa										
Covington										
Crenshaw										
Cullman										
Dale	45 314	561								
Dallas										
De Kalb										

*Less than .5 psi overpressure

STATE OF ALABAMA (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	POPULATION AREA	POPULATION AREA	MEDIUM RISK		LOW/NO* RISK POPULATION AREA
					POPULATION AREA	POPULATION AREA	
Elmore	47 012	622					37 656 x 951
Escambia							103 697 x 542
Etowah							19 147 x 630
Fayette							28 748 643*
Franklin							
Geneva							23 783 578
Greene							11 243 631
Hale							15 065 661*
Henry	79 172	577					15 326 557
Houston							
Jackson	51 402	1 069					
Jefferson	671 808	1 119					
Lamar							16 420 605
Lauderdale							81 917 661*
Lawrence							31 671 693*
Lee							
Limestone							
Lowndes							
Macon							
Madison	213 250	806					
Marengo							
Marion							
Marshall							
Mobile	328 158	1 238					
Monroe							

*Less than .5 psi overpressure

STATE OF ALABAMA (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA
Montgomery	206 993	793		
Morgan	94 796	575		
Perry	•••••	•••••	•••••	15 045 719*
Pickens	•••••	•••••	•••••	21 915 890
Pike	•••••	•••••	•••••	28 106 672
Randolph	•••••	•••••	•••••	20 236 585
Russell	•••••	•••••	48 550 634	
St. Clair	•••••	•••••	•••••	44 539 646
Shelby	75 418	800	•••••	
Sumter	•••••	•••••	•••••	17 202 907*
Talladega	77 228	753		
Tallapoosa	•••••	•••••	•••••	
Tuscaloosa	•••••	•••••	•••••	39 107 701*
Walker	68 882	803		139 201 1 336
Washington	17 443	1 081		
Wilcox	•••••	•••••	•••••	
Winston	•••••	•••••	•••••	15 322 883*
TOTAL STATE	2 097 642 11 466	47 012	622 293' 160 4 514	1 521 331 34 137
				(838 407 16 789)
				(682 924 17 348)*

*Less than .5 psi overpressure

S T A T E O F F L O R I D A - - D I R E C T E F F E C T S R I S K

Estimated 1985 Population: 11,883,346
 Land Area: 63,397 square miles

COUNTY	POPULATION AREA	EQ/GT 10 PSI	HIGH RISK EQ/GT 5PSI LT 10PSI POPULATION AREA	MEDIUM RISK EQ/GT 2PSI LT 5PSI POPULATION AREA	LOW/NO* RISK	
					EQ/GT • 5PSI POPULATION AREA	EQ/GT • 2PSI POPULATION AREA
Alachua	•••••	•••••	•••••	•••••	789	260
Baker	•••••	•••••	•••••	•••••	17	591
Bay	•••••	•••••	•••••	•••••	585*	585*
Bradford	•••••	•••••	•••••	•••••	293	293
Brevard	343 585	995	•••••	•••••	23	983
Broward	1 112 075	1 211	•••••	•••••	9	556
Calhoun	•••••	•••••	•••••	•••••	568*	568*
Charlotte	79 404	690	•••••	•••••	•••••	•••••
Citrus	78 546	629	•••••	•••••	•••••	•••••
Clay	84 793	592	•••••	•••••	•••••	•••••
Collier	•••••	•••••	•••••	•••••	116	981
Columbia	•••••	•••••	•••••	•••••	39	947
Dade	1 726 021	1 995	•••••	•••••	797*	797*
De Soto	•••••	•••••	•••••	•••••	21	295
Dixie	•••••	•••••	•••••	•••••	9	476
Duval	623 035	776	•••••	•••••	701*	701*
Escambia	260 730	661	•••••	•••••	•••••	•••••
Flagler	•••••	•••••	•••••	•••••	•••••	•••••
Franklin	•••••	•••••	•••••	•••••	•••••	•••••
Gadsden	•••••	•••••	•••••	•••••	•••••	•••••
Gilchrist	•••••	•••••	•••••	•••••	7	267
Glades	•••••	•••••	•••••	•••••	6	765
Gulf	•••••	•••••	•••••	•••••	8	343
Hamilton	•••••	•••••	•••••	•••••	43	693
Hardee	•••••	•••••	•••••	•••••	518	518

*Less than .5 psi overpressure

STATE OF FLORIDA (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* POPULATION AREA	RISK
Hendry	•••••	•••••	•••••	22 565	1 163*
Hernando	•••••	•••••	•••••	74 901	477*
Highlands	•••••	•••••	•••••	58 524	1 029*
Hillsborough	743 771	1 053	•••••	15 934	488*
Holmes	•••••	•••••	•••••	•••••	•••••
Indian River	•••••	•••••	•••••	77 629	497
Jackson	•••••	•••••	•••••	40 768	942*
Jefferson	•••••	•••••	•••••	11 658	609
Lafayette	•••••	•••••	•••••	4 332	545*
Lake	•••••	•••••	127 239	954	•••••
Lee	•••••	•••••	•••••	246 738	803
Leon	168 231	676	•••••	•••••	•••••
Levy	24 623	1 100	•••••	•••••	•••••
Liberty	•••••	•••••	•••••	4 576	837*
Madison	•••••	•••••	•••••	15 443	710
Manatee	174 772	947	•••••	163 799	1 610
Marion	•••••	•••••	•••••	•••••	•••••
Martin	82 856	555	•••••	•••••	•••••
Monroe	71 003	1 034	•••••	•••••	•••••
Nassau	•••••	•••••	•••••	38 569	649
Okaloosa	131 901	936	•••••	•••••	•••••
Okeechobee	•••••	•••••	•••••	25 812	771
Orange	547 930	910	•••••	•••••	•••••
Osceola	•••••	•••••	•••••	•••••	•••••
Palm Beach	721 030	1 993	•••••	•••••	•••••
Pasco	•••••	•••••	•••••	232 936	738
Pinellas	808 500	280	•••••	•••••	•••••
Polk	•••••	•••••	•••••	363 740	1 823
Putnam	•••••	•••••	•••••	59 098	733
St Johns	•••••	•••••	•••••	67 087	617

*Less than .5 psi overpressure

STATE OF FLORIDA (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* POPULATION AREA	RISK AREA
St Lucie	117 109	581			
Santa Rosa	65 097	1 024			
Sarasota	246 395	573			
Seminole	232 587	298			
Sumter	29 162	561*
Swannee	25 644	690*
Taylor	18 167	1 058*
Union	11 562	246
Volusia	310 689	1 113			
Wakulla	12 889	601			
Walton	25 509	1 066			
Washington	16 144.	590*
TOTAL STATE	8 793 081	22 226	---	302 800	3 132 2 787 465 38 039 (1 449 745 21 841) (1 337 720 16 198)*

*Less than .5 psi overpressure

S T A T E O F G E O R G I A - - D I R E C T E F F E C T S R I S K

Estimated 1985 Population: 5,929,233
 Land Area: 58,117 square miles

COUNTY	POPULATION AREA	EQ/GT 10 PSI POPULATION AREA	EQ/GT 5PSI LT 10PSI POPULATION AREA	EQ/GT 2PSI LT 5PSI POPULATION AREA	EQ/GT 2PSI LT 5PSI POPULATION AREA	LOW/NO* RISK	
						VERY HIGH RISK	HIGH RISK
Appling	16 441	510	•••••	•••••	•••••	6 254	344*
Atkinson	•••••	•••••	•••••	•••••	•••••	9 572	286*
Bacon	•••••	•••••	•••••	•••••	•••••	3 541	347*
Baker	•••••	•••••	•••••	•••••	•••••	38 659	258*
Baldwin	•••••	•••••	•••••	•••••	•••••	•••••	•••••
Banks	•••••	•••••	•••••	•••••	•••••	9 940	234*
Barrow	44 059	456	•••••	•••••	•••••	24 768	163
Bartow	•••••	•••••	•••••	•••••	•••••	•••••	•••••
Ben Hill	•••••	•••••	•••••	•••••	•••••	17 067	254*
Berrien	•••••	•••••	•••••	•••••	•••••	13 842	456
Bibb	158 476	253	•••••	•••••	•••••	•••••	•••••
Bleckley	•••••	•••••	•••••	•••••	•••••	10 645	219
Brantley	•••••	•••••	•••••	•••••	•••••	9 430	444
Brooks	•••••	•••••	•••••	•••••	•••••	15 299	491
Bryan	•••••	•••••	•••••	•••••	•••••	12 164	441
Bulloch	•••••	•••••	•••••	•••••	•••••	37 271	678*
Burke	•••••	20 728	833	•••••	•••••	15 169	187
Butts	•••••	•••••	•••••	•••••	•••••	5 527	284*
Calhoun	17 682	649	•••••	•••••	•••••	•••••	•••••
Camden	•••••	•••••	•••••	•••••	•••••	•••••	•••••
Candler	•••••	•••••	•••••	•••••	•••••	7 833	248*
Carroll	63 098	502	•••••	•••••	•••••	38 746	163
Catoosa	•••••	•••••	•••••	•••••	•••••	•••••	•••••
Charlton	•••••	•••••	•••••	•••••	•••••	7 741	780
Chatham	214 908	444	•••••	•••••	•••••	•••••	•••••

*Less than .5 psi overpressure

STATE OF GEORGIA (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA
Chattahoochee	20 139 250
Chattooga	21 345 314*
Cherokee	76 890	122	...	65 533 424
Clarke	3 278 197*
Clay
Clayton	165 686	148	...	6 863 821*
Clinch
Cobb	368 393	343
Coffee	28 818 602*
Colquitt	36 484 556*
Columbia	51 795 290	...
Cook	13 889 232
Coweta	43 886 444	...
Crawford	7 087 328
Crisp	20 258 275*
Dade
Dawson	11 389 176
Decatur	5 873 210*
De Kalb	506 550	270	...	26 635 586*
Dodge	16 747 504*
Dooly	10 616 397*
Dougherty	103 630	330
Douglas	65 631	203
Early	13 150 516	...
Echols	2 235 420
Effingham
Elbert	21 091 482
Emanuel	19 042 367*
Evans	15 266	384	...	21 366 688*
Fannin	8 504 186*

*Less than .5 psi overpressure

STATE OF GEORGIA (Continued)

COUNTY	POPULATION	AREA	VERY HIGH RISK	HIGH RISK	MEDIUM RISK	LOW/NO* RISK	
			POPULATION	AREA	POPULATION	AREA	
Fayette				42 806	199	78 516	519
Floyd						34 431	226
Forsyth						15 569	264*
Franklin							
Fulton	621 030	534					
Gilmer						11 822	427
Glascock						2 331	144*
Glynn	60 350	412					
Gordon						32 616	355*
Grady						21 318	459
Greene							
Gwinnett			246 112	435		11 978	390*
Habersham						27 014	278*
Hall						83 207	379*
Hancock						9 302	469*
Haralson							
Harris			16 380	464		19 589	283
Hart							
Heard			6 750	292		19 220	230*
Henry						43 673	321
Houston	85 180	380					
Irwin						8 813	362*
Jackson			27 158	342			
Jasper					7 744	371	
Jeff Davis						11 846	335*
Jefferson						18 725	529*
Jenkins							
Johnson						8 421	353
Jones	18 579	394				8 602	307
Lamar							
Lanier						12 294	186*
						5 644	194*

*Less than .5 psi overpressure

STATE OF GEORGIA (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA
Laurens	14 081	358
Lee	41 837	517		
Liberty		
Lincoln	5 675	402
Long		
Lowndes	72 742	507		
Lumpkin		
McDuffie		
McIntosh	8 025	425	
Macon		
Madison	19 508	285		
Marion		
Meriwether		
Miller		
Mitchell	21 841	512
Monroe	14 949	397	
Montgomery		
Morgan		
Murray		
Muscogee	177 080	218		
Newton	38 957	277
Oconee	14 648	186
Oglethorpe		
Paulding	29 957	312		
Peach		
Pickens		
Pierce		
Pike	33 165	312		
Polk		
Pulaski		

*Less than .5 psi overpressure

STATE OF GEORGIA (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA
Putnam	11 700	344*
Quitman	2 156	146*
Rabun	10 840	370*
Randolph	9 381	481*
Richmond	189 036	326
Rockdale	44 501	132	3 354	169*
Schley	14 396	655*
Screvan	8 775	225
Seminole	51 453	199*
Spalding	22 239	177*
Stephens	5 862	452*
Stewart	30 374	488*
Sumter	6 496	395*
Talbot	1 986	196*
Taliaferro	17 783	484
Tattnall	8 082	382*
Taylor	11 042	444*
Telfair	11 943	337
Terrell	38 187	551
Thomas	33 722	268
Tift
Toombs	23 633	371	6 279	165*
Towns	5 997	202*
Treutlen	53 248	415*
Troup	9 643	289*
Turner
Twiggs	10 583	320*
Union	26 591	326*
Upson	55 155	446
Walker

*Less than .5 psi overpressure

STATE OF GEORGIA (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA
Walton	32 390	330
Ware	37 123
Warren	6 439
Washington	19 307
Wayne	22 128
Webster	2 077
Wheeler	5 056
White	11 205
Whitfield	242
Wilcox	68 141
Wilkes	7 559
Wilkinson	382
Worth	18 259	575	11 356
TOTAL STATE	3 233 308	9 311	371 511 -4 297	395 251 4 824

POPULATION AREA	POPULATION AREA	POPULATION AREA	POPULATION AREA
1 929	163	39	685
(859	567	16	431)
(1 069	596	23	254)*

*Less than .5 psi overpressure

STATE OF KENTUCKY -- DIRECT EFFECTS RISK

Estimated 1985 Population: 3,730,146
Land Area: 39,639 square miles

COUNTY	POPULATION AREA	POPULATION AREA	VERY HIGH RISK	HIGH RISK	MEDIUM RISK	LOW/NO* RISK
			GT 10 PSI	EQ/GT 5PSI LT 10PSI	EQ/GT 2PSI LT 5PSI	EQ/GT .5PSI LT 2PSI
Adair	15 857 407*
Allen	14 370 338*
Anderson	13 522 204
Ballard	8 186	254
Barren	34 692	482*
Bath	10 263 278*
Bell	34 201 361*
Boone	51 553	246
Bourbon	54 575	161	19 147 292
Boyd
Boyle	25 106 182*
Bracken	7 555 203*
Breathitt	16 453 495*
Breckinridge	45 100	300
Bullitt	16 566 565
Butler	11 958	431
Caldwell	13 265 347*
Calloway	80 896	152	30 551 386*
Campbell	5 262 191
Carlisle
Carroll	9 850	130	25 814 407
Carter	15 293 445
Casey	64 360	722
Christian	29 442 255*
Clark

*Less than .5 psi overpressure

STATE OF KENTUCKY (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NOT* RISK POPULATION AREA
Clay	23	867	471*	
Clinton	9	984	196*	
Crittenden	8	896	360*	
Cumberland	7	334	304*	
Daviess	88	834	463*	
Edmonson	11	567	302*	
Elliott	6	923	234*	
Estill	15	107	256	
Fayette	211	628	285	
Fleming	12	524	351	
Floyd	51	295	393	
Franklin	44	192	212	
Fulton	4	962	99	
Gallatin				
Garrard			11 397	232
Grant				14 477
Graves				37 712
Grayson				22 631
Green				10 950
Greenup				38 515
Hancock				8 242
Hardin	90	545	629	
Harlan				42 139
Harrison				15 678
Hart				17 009
Henderson				42 474
Henry				13 467
Hickman				5 618
Hopkins				46 424
Jackson			12 586	346

*Less than .5 psi overpressure

STATE OF KENTUCKY (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA
Jefferson	682 179	386		
Jessamine		
Johnson		
Kenton	136 391	163	25 895 264
Knott	18 395 352
Knox	30 205 358*
Larue	12 018 263*
Laurel	42 251 434*
Lawrence	15 007 420
Lee	7 781 211*
Leslie	15 407 402*
Letcher	30 977 339*
Lewis	14 458	484		
Lincoln	19 180 332
Livingston	9 131 312*
Logan	26 045 556
Lyon	6 425 209*
McCracken	61 367	251		
McCreary	16 306 427
McLean	9 948 256
Madison	55 644	443		
Magoffin	14 251 310
Marion	17 699 347*
Marshall	25 976 304*
Martin	1 063 231
Mason	17 091 241
Meade	22 789	307		
Menifee	5 353 203*
Mercer	19 405 250*
Metcalf	10 359 291*

*Less than .5 psi overpressure

STATE OF KENTUCKY (continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA
Monroe	***	***	12 618	331*
Montgomery	***	***	20 410	199*
Morgan	***	31 696	12 122	382*
Muhlenberg	***	478	28 923	424*
Nelson	***	***	7 330	197*
Nicholas	***	21 875	596	***
Ohio	***	***	30 519	190
Oldham	***	***	9 217	354
Owen	***	***	5 641	198*
Owsley	***	***	***	***
Pendleton	***	***	10 767	281*
Perry	***	83 875	35 419	341*
Pike	***	785	***	***
Powell	***	49 129	11 907	180
Pulaski	***	660	***	***
Robertson	***	14 664	2 383	100*
Rockcastle	***	318	***	***
Rowan	***	***	19 043	282*
Russell	***	***	15 141	250
Scott	***	21 971	286	***
Shelby	***	***	24 243	385
Simpson	***	***	14 936	236*
Spencer	***	***	6 148	192*
Taylor	***	***	22 162	270*
Todd	***	***	10 649	377
Trigg	***	***	9 386	421
Trimble	6 321	148	***	***
Union	***	***	17 807	341*
Warren	***	***	82 907	547*
Washington	***	***	10 291	301

*Less than .5 psi overpressure

STATE OF KENTUCKY (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA
Wayne	•••••	•••••	•••••	17 759 446
Webster	•••••	•••••	•••••	14 730 336*
Whitley	•••••	•••••	•••••	35 619 443*
Wolfe	•••••	•••••	•••••	7 152 223*
Woodford	•••••	•••••	18 845 192	
TOTAL STATE	1 555 778 7 070	106 002 936	312 507 2 083	1 755 859 29 550 (601 871 11 122) (1 153 988 18 428)*

*Less than .5 psi overpressure

STATE OF MISSISSIPPI -- DIRECT EFFECTS RISK

Estimated 1985 Population: 2,617,133

Land Area: 47,174 square miles

COUNTY	VERY HIGH RISK			HIGH RISK			MEDIUM RISK			LOW/NO* RISK		
	GT 10 PSI	GT 5PSI POPULATION AREA	LT 10PSI POPULATION AREA	EQ/GT 2PSI POPULATION AREA	LT 5PSI POPULATION AREA	EQ/GT 5PSI POPULATION AREA	LT 2PSI POPULATION AREA	EQ/GT .5PSI POPULATION AREA	LT 2PSI POPULATION AREA	EQ/GT .5PSI POPULATION AREA	LT 2PSI POPULATION AREA	EQ/GT .5PSI POPULATION AREA
Adams	•	•	•	•	•	•	•	•	•	39	119	456*
Alcorn	•	•	•	•	•	•	•	•	•	32	183	401*
Amite	•	•	•	•	•	•	•	•	•	13	288	732*
Attala	•	•	•	•	•	•	•	•	•	18	901	737*
Benton	•	•	•	•	•	•	•	•	•	8	126	407*
Bolivar	•	•	•	•	•	•	•	•	•	45	246	892*
Calhoun	•	•	•	•	•	•	•	•	•	15	196	573*
Carroll	•	•	•	•	•	•	•	•	•	9	173	634*
Chickasaw	•	•	•	•	•	•	•	•	•	17	923	503*
Choctaw	•	•	•	•	•	•	•	•	•	8	542	420*
Claiborne	•	•	•	•	•	•	•	•	•	12	621	494*
Clarke	•	•	•	•	•	•	•	•	•	16	823	692
Clay	•	•	22 053	415	•	•	•	•	•	•	•	•
Coahoma	•	•	•	•	•	•	•	•	•	35	424	559*
Copiah	•	•	•	•	•	•	•	•	•	25	744	779*
Covington	•	•	•	•	•	•	•	•	•	15	888	416*
De Soto	•	70 812	469	•	•	•	•	•	•	•	•	•
Forrest	•	•	•	•	•	•	•	•	•	8	373	566*
Franklin	•	•	•	•	•	•	•	•	•	•	•	•
George	•	•	•	•	•	•	•	•	•	•	•	•
Greene	•	•	•	•	•	•	•	•	•	9	382	718
Grenada	•	29 671	478	•	•	•	•	•	•	•	•	•
Hancock	•	171 484	581	•	•	•	•	•	•	•	•	•
Harrison	•	261 467	875	•	•	•	•	•	•	•	•	•
Hinds	•	•	•	•	•	•	•	•	•	•	•	•

*Less than .5 psi overpressure

STATE OF MISSISSIPPI (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	POPULATION AREA	POPULATION AREA	POPULATION AREA	LOW/NO* RISK	
						POPULATION	AREA
Holmes	•••••	•••••	•••••	•••••	•••••	23 784	759
Humphreys	•••••	•••••	•••••	•••••	•••••	13 934	430
Issaquena	•••••	•••••	•••••	•••••	•••••	2 147	406*
Itawamba	•••••	•••••	•••••	•••••	•••••	20 299	541*
Jackson	124 917	731	17 173	678	•••••	9 793	523*
Jasper	•••••	•••••	•••••	•••••	•••••	14 104	409*
Jefferson	•••••	•••••	•••••	•••••	•••••	•••••	•••••
Jefferson Davis	•••••	•••••	•••••	•••••	•••••	10 373	766
Jones	64 507	695	•••••	•••••	•••••	•••••	•••••
Kemper	•••••	•••••	•••••	•••••	•••••	32 522	609*
LaFayette	•••••	•••••	•••••	•••••	•••••	•••••	•••••
Lamar	26 768	499	•••••	•••••	•••••	13 144	435*
Lauderdale	80 005	705	•••••	•••••	•••••	18 683	584*
Lawrence	•••••	•••••	•••••	•••••	•••••	•••••	•••••
Leake	•••••	•••••	•••••	•••••	•••••	•••••	•••••
Lee	•••••	•••••	•••••	•••••	•••••	61 285	451*
Leflore	•••••	•••••	•••••	•••••	•••••	42 369	605*
Lincoln	•••••	•••••	•••••	•••••	•••••	31 099	586*
Lowndes	61 314	517	•••••	•••••	•••••	•••••	•••••
Madison	•••••	•••••	•••••	•••••	•••••	45 724	717
Marion	•••••	•••••	•••••	•••••	•••••	27 571	548
Marshall	•••••	•••••	•••••	•••••	•••••	32 405	709
Monroe	•••••	•••••	•••••	•••••	•••••	12 660	408*
Montgomery	•••••	•••••	•••••	•••••	•••••	24 674	571
Neshoba	•••••	•••••	•••••	•••••	•••••	•••••	•••••
Newton	•••••	•••••	•••••	•••••	•••••	20 288	580
Noxubee	•••••	•••••	•••••	•••••	•••••	12 537	698*
Oktibbeha	•••••	•••••	•••••	•••••	•••••	38 129	459
Panola	•••••	•••••	•••••	•••••	•••••	29 785	695*
Pearl River	•••••	•••••	•••••	•••••	•••••	38 167	819

*Less than .5 psi overpressure

STATE OF MISSISSIPPI (Continued)

COUNTY	VERY HIGH RISK POPULATION	AREA	HIGH RISK POPULATION	AREA	MEDIUM RISK POPULATION	AREA	LOW/NO* RISK POPULATION	AREA											
	1	034	591	8	037	39	226	1	093	149	393	3	214	1	393	923	34	830	
Perry										10	646			651*					
Pike										36	699			410*					
Pontotoc										21	744			499*					
Prentiss										24	682			417*					
Quitman										11	334			406*					
Rankin	80	192		782						25	256			610*					
Scott										8	076			435					
Sharkey										24	762			591*					
Simpson										14	554			635					
Smith																			
Stone										10	110			446*					
Sunflower										37	634			707*					
Tallahatchie										16	124			651*					
Tate										21	311			406*					
Tippah										18	985			458*					
Tishomingo										17	338			434*					
Tunica										9	299			460					
Union										21	595			417*					
Walton										12	870			404*					
Warren										51	872			597*					
Washington															72	533	733*		
Wayne										20	152	813							
Webster															10	196	424*		
Wilkinson															10	484	678*		
Winston															18	567	610*		
Yalobusha															13	387	478*		
Yazoo	26	826	933																

*Less than .5 psi overpressure
 (1 115 846 26 967)*

STATE OF NORTH CAROLINA -- DIRECT EFFECTS RISK

Estimated 1985 Population: 6,233,774
 Land Area: 48,843 square miles

COUNTY	POPULATION AREA	POPULATION AREA	VERY HIGH RISK	HIGH RISK	MEDIUM RISK	LOW/NO* RISK
			GT 10 PSI	EQ/GT 5PSI LT 10PSI	EQ/GT 2PSI LT 5PSI	EQ/GT • 5PSI LT 2PSI
Alamance	102	865	433			26 671 259*
Alexander						9 941 234*
Alleghany						26 266 533*
Anson						23 263 426*
Ashe						
Avery						15 040 247*
Beaufort						43 217 826*
Bertie						21 491 701*
Bladen	45	643	861		30 794 879	
Brunswick						
Buncombe						166 717 659*
Burke						75 193 505*
Cabarrus						93 522 364
Caldwell						68 745 471*
Camden						5 866 241*
Carteret	48	181	525			
Caswell					22 441 427	
Catawba	112	583	396			
Chatham						35 680 708*
Cherokee					20 231 452	
Chowan						12 995 181*
Clay						7 093 214*
Cleveland						84 762 468*
Columbus						51 937 939*
Craven						77 821 702

*Less than .5 psi overpressure

STATE OF NORTH CAROLINA (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA					
							MEDIUM RISK AREA	RISK AREA
Cumberland	252	353	657	13	318
Currituck	17	107
Dare	118	693	548	391*	391*
Davidson	27	416
Davie	267	267
Duplin	41	650
Durham	160	837
Edgecombe	58	790
Forsyth	258	622	412	506*	506*
Franklin	32	305
Gaston	170	614	357	494*	494*
Gates	9	357
Graham	7	104
Granville	36	884
Greene	16	464
Guilford	327	323	651	56	258
Halifax	62	366	601	724*
Harnett	47	835
Haywood	66	501
Henderson	375*	375*
Hertford	24	076
Hoke	22	566	391	5	925
Hyde	624*	624*
Iredell	87	260	574	27	318
Jackson	490*	490*
Johnston	76	426
Jones	9	806
Lee	40	039
Lenoir	45	086	298	259	259
Lincoln	61	276

*Less than .5 psi overpressure

STATE OF NORTH CAROLINA (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA
McDowell	36 454 437*
Macon	23 466 517*
Madison	17 250 451*
Martin	27 437 461*
Mecklenburg	439 986	528
Mitchell	14 258 222*
Montgomery	55 254	701	23 665 490
Moore
Nash	70 931 540*
New Hanover	112 147	185
Northampton	22 485 538*
Onslow	120 039	763
Orange	81 875 400*
Pamlico	10 925 341*
Passquotank	29 502 228*
Pender	24 268 875
Perquimans	9 913 246*
Person	30 316	398
Pitt	96 024 656*
Polk	14 758 238*
Randolph	97 642 789
Richmond	45 644	477
Robeson	106 472	949
Rockingham	85 801 569
Rowan	102 667 519*
Rutherford
Sampson	56 501 568*
Scotland	50 707 947
Stanly	35 319	452	34 149	319
Stokes	50 203 396*

*Less than .5 psi overpressure

STATE OF NORTH CAROLINA (Continued)

COUNTY	POPULATION	HIGH RISK AREA		HIGH RISK POPULATION AREA		MEDIUM RISK AREA		MEDIUM RISK POPULATION AREA		LOW/NO* RISK AREA	
		VERY	HIGH	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Surry	***	***	***	***	***	***	***	60	500	539	
Swain	***	***	***	***	***	***	***	10	818	526*	
Transylvania	***	***	***	***	***	***	***	25	249	378*	
Tyrrell	***	***	***	***	***	***	***	4	130	407*	
Union	***	***	***	***	***	***	***	77	802	639	
Vance	***	***	***	***	***	***	***	38	320	249*	
Wake	346	147	854	***	***	***	***	16	236	427*	
Warren	***	***	***	***	***	***	***	14	473	332*	
Washington	***	***	***	***	***	***	***	34	273	314*	
Watauga	***	***	***	***	***	***	***				
Wayne	98	361	554	***	***	***	***	60	948	752*	
Wilkes	***	***	***	***	***	***	***	64	997	374	
Wilson	***	***	***	***	***	***	***	29	498	336	
Yadkin	***	***	***	***	***	***	***	15	431	314*	
Yancey	***	***	***	***	***	***	***				
TOTAL STATE	2 342	278	10 017	---	---	809	177	4 625	3 082	319	34 201

(1 133 455 10 002)
(1 948 864 24 001)*

*Less than .5 psi overpressure

STATE OF SOUTH CAROLINA -- DIRECT EFFECTS RISK

COUNTY	POPULATION AREA	EQ/GT 10 PSI POPULATION AREA	HIGH RISK EQ/GT 5PSI LT 10PSI POPULATION AREA	MEDIUM RISK EQ/GT 2PSI LT 5PSI POPULATION AREA	LOW/NO* RISK EQ/GT .5PSI LT 2PSI POPULATION AREA	
					EQ/GT 10 PSI POPULATION AREA	EQ/GT 2PSI LT 5PSI POPULATION AREA
Abbeville	22 919
Aiken	113 409	1 092	10 904	413	508*
Allendale	139 797
Anderson	18 097
Bamberg	395*
Barnwell	20 308	558
Beaufort	81 853	579	41 186
Berkeley	117 319	1 108	11 431	380	396
Calhoun	30 992
Charleston	291 814	938	580*
Cherokee	38 454
Chester	802*
Chesterfield	28 112
Clarendon	602
Colleton	33 866
Darlington	1 052
Dillon	64 933
Dorchester	17 809	490	563*
Edgefield	32 316
Fairfield	406*
Florence	73 846
Georgetown	47 533	822	575
Greenville
Greenwood	60 352
Hampton	451*
						18 899
						561

*Less than .5 psi overpressure

STATE OF SOUTH CAROLINA (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA
Horry	126	279	1 143	14 369 655
Jasper	42 124 723
Kershaw	55 843 552*
Lancaster	53 481 712*
Laurens
Lee	18 510 411
Lexington	156 949	707	7 183 350
McCormick	34 924 493*
Marion	32 459 483*
Marlboro
Newberry	32 044 634*
Oconee	51 780	629	86 706 1 112
Orangeburg
Pickens	85 403	499
Richland	282 019	762
Saluda	17 017 456*
Spartanburg	209 163	814
Sumter	94 839	665	30 826 515
Union	39 284 934*
Williamsburg
York	116 464 685
TOTAL STATE	1 384 092	8 113	199 592 2 058 32 178 1 145	1 727 560 18 891) (1 079 509 10 118) (648 051 8 773)*

*Less than .5 psi overpressure

STATE OF TENNESSEE -- DIRECT EFFECTS RISK

Estimated 1985 Population: 4,746,516
 Land Area: 40,930 square miles

COUNTY	POPULATION AREA	VERY HIGH RISK GT 10 PSI			HIGH RISK EQ/GT 5PSI LT 10PSI			MEDIUM RISK EQ/GT 2PSI LT 5PSI			LOW/NO* RISK EQ/GT .5PSI LT 2PSI		
		POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Anderson	69 607	339				28 701	475			15 088		392*	
Bedford													
Benton										9 278		407*	
Bledsoe													
Blount										81 926		558	
Bradley	70 601	327											
Campbell													
Cannon													
Carroll						28 302	600						
Carter													
Cheatham													
Chester													
Claiborne													
Clay													
Cocke													
Coffee	40 569	429											
Crockett													
Cumberland													
Davidson	487 241	501											
Decatur													
DeKalb													
Dickson													
Dyer													
Fayette													
Fentress													

*Less than .5 psi overpressure

STATE OF TENNESSEE (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA
Franklin	33 382	543		
Gibson	48 338	602		
Giles				24 789 610*
Grainer				17 155 273*
Greene		56 054 619		
Grundy				14 085 361*
Hamblen				59 098 156*
Hamilton	282 988	539		
Hancock				6 751 480
Hardeman				23 322 670*
Hardin				22 314 578*
Hawkins		45 137 486		
Haywood				20 547 534*
Henderson				21 854 520
Henry				29 023 560*
Hickman				
Houston	7 011	200		15 927 610*
Humphreys				15 702 527
Jackson				9 146 308*
Jefferson				35 027 266*
Johnson				14 302 297*
Knox	331 840	506		
Lake				8 310 168*
Lauderdale				24 256 475
Lawrence				34 625 617*
Lewis				
Lincoln				10 580 282*
Loudon				26 229 571
McMinn				
McNairy				23 337 562*

*Less than .5 psi overpressure

STATE OF TENNESSEE (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA
Macon	15 667 307*
Madison	76 858 558
Marion	24 502 512
Marshall	20 095 376*
Maury	51 863 616*
Meigs	7 787 189
Monroe	30 048 648
Montgomery	88 788 539
Moore	4 907 129
Morgan	17 290 523
Obion	32 980 550
Overton	18 095 433*
Perry	6 427 412*
Pickett	4 510 159*
Polk	13 605 437
Putnam	50 464 399*
Rhea	24 819 309
Roane	49 436 357
Robertson	38 717 476
Rutherford	97 308 605
Scott	20 635 528*
Sequatchie	8 618 266
Sevier	47 229 590*
Shelby	796 450 772
Smith	14 564 313*
Stewart	9 154 454
Sullivan	145 705 415
Sumner	92 025 529
Tipton	35 021 454
Trousdale	5 488 114*

*Less than .5 psi overpressure

STATE OF TENNESSEE (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA			HIGH RISK POPULATION AREA			MEDIUM RISK POPULATION AREA			LOW/NO* RISK POPULATION AREA	
Unicoi	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	16	911
Union	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	12	358
Van Buren	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	4	782
Warren	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	33	436
Washington	92	699	326								
Wayne	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	14	115
Weakley	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	33	395
White	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	19	814
Williamson	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	68	284
Wilson	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	61	352
TOTAL STATE	2	549	809	6	849	213	131	2	717	108	999
										1	934
										874	577
										(430
										888	913
										(11
										985	664
										17	923*

*Less than .5 psi overpressure

F E M A R E G I O N V - - D I R E C T E F F E C T S R I S K S U M M A R Y

Estimated 1985 Population: 45,687,087
 Land Area: 323,545 square miles

STATE	POPULATION AREA	HIGH RISK		MEDIUM RISK		LOW/NO* RISK	
		EQ/GT 10 PSI	EQ/GT 5PSI LT 10PSI POPULATION AREA	EQ/GT 2PSI LT 5 PSI POPULATION AREA	EQ/GT •5PSI LT 2PSI POPULATION AREA	EQ/GT 10 PSI	EQ/GT •5PSI LT 2PSI POPULATION AREA
Illinois	8 517 316	13 686	68 783	682	297 785	5 417	2 673 372
Indiana	1 842 108	7 796	---	---	759 597	5 842	2 897 931
Michigan	5 590 565	16 262	---	---	1 296 474	7 930	2 143 739
Minnesota	2 079 535	11 751	214 648	430	73 301	2 332	1 813 747
Ohio	6 496 446	12 365	850 066	4 999	1 487 248	6 027	1 804 873
Wisconsin	1 561 858	4 763	120 916	273	96 613	457	1 497 768
TOTAL REGION V	26 087 828	66 623	1 254 413	6 384	4 011 018	28 005	14 333 828
							222 533
							(6 300 432 63 473)
							(8 033 396 159 060)*

*Less than .5 psi overpressure

STATE OF ILLINOIS -- DIRECT EFFECTS RISK

Estimated 1985 Population: 11,557,256
 Land Area: 55,586 square miles

COUNTY	POPULATION AREA	HIGH RISK			MEDIUM RISK			LOW/NO* RISK		
		GT 10 PSI	EQ/GT 5PSI	LT 10PSI	EQ/GT 2PSI	LT 5PSI	EQ/GT • 5PSI	LT 2PSI	POPULATION AREA	POPULATION AREA
Adams	70	543	852	11	799
Alexander	236*	16	041
Bond	377*	28	123
Boone	282*	5	480
Brown	306
Bureau	37	832	869*
Calhoun	5	833	250	14	387
Carroll	17	942	444	374*
Cass
Champaign	170	697	998
Christian	36	273	710
Clark	16	728	505
Clay	15	596	469*
Clinton	33	632	472*
Coles	52	388	509*
Cook	5	274	484	958	19	563	417*
Crawford	20	950	446
Cumberland	10	918	346*
DeKalb	73	019	634*
Dewitt	17	938	397*
Douglas	711	968	337
Du Page	21	269	623
Edgar	8	235	223
Edwards	31	633	478*
Effingham

*Less than .5 psi overpressure

STATE OF ILLINOIS (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA
Fayette	14 938	486	22 339 709*
Ford	43 111 414*
Franklin	40 582 871
Fulton	7 644 325
Gallatin
Green	15 939 543*
Grundy	31 503	423
Hamilton	23 650	795	9 224 436*
Hancock
Hardin	5 474 181*
Henderson	9 159	373
Henry	53 526 824
Iroquois	32 535 1 118
Jackson	61 293 590*
Jasper	11 497 496
Jefferson	38 604 570*
Jersey	20 256 373
Jo Daviess	23 263	603
Johnson	10 149 346
Kane	298 217 524
Kankakee	99 413 678
Kendall
Knox	36 647 322	57 954 720*
Lake	465 841	454
La Salle	108 455	1 139
Lawrence	18 424	374
Lee	33 826 725*
Livingston	40 686 1 046
Logan	30 475 619
McDonough	36 265	590

*Less than .5 psi overpressure

STATE OF ILLINOIS (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA			
					POPULATION	AREA	POPULATION
McHenry	•••••	•••••	•••••	•••••	158	605	607
McLean	•••••	•••••	•••••	•••••	152	292	1 185
Macon	•••••	•••••	•••••	•••••	127	873	581
Macoupin	•••••	•••••	•••••	•••••	49	374	865*
Madison	247	422	728	•••••	•••••	•••••	•••••
Marion	•••••	•••••	•••••	•••••	44	925	573*
Marshall	•••••	•••••	•••••	•••••	13	787	388*
Mason	•••••	•••••	•••••	•••••	17	943	536
Massac	14	850	241	•••••	•••••	•••••	•••••
Menard	•••••	•••••	•••••	•••••	11	674	315
Mercer	•••••	•••••	•••••	•••••	19	385	559
Monroe	•••••	•••••	•••••	•••••	21	041	388
Montgomery	•••••	•••••	•••••	•••••	32	096	705*
Morgan	•••••	•••••	•••••	•••••	37	146	568*
Moultrie	•••••	•••••	•••••	•••••	14	598	325*
Ogle	•••••	•••••	•••••	•••••	45	687	759
Peoria	191	238	620	•••••	•••••	•••••	•••••
Perry	•••••	•••••	•••••	•••••	22	442	442*
Piatt	•••••	•••••	•••••	•••••	16	400	439*
Pike	•••••	•••••	•••••	•••••	18	603	830*
Pope	•••••	•••••	•••••	•••••	4	345	374
Pulaski	•••••	•••••	•••••	•••••	8	556	203
Putnam	•••••	35	699	583	6	199	160*
Randolph	•••••	•••••	•••••	•••••	18	653	360
Richland	•••••	•••••	•••••	•••••	•••••	•••••	•••••
Rock Island	164	903	423	•••••	•••••	•••••	•••••
St. Clair	267	819	672	•••••	•••••	•••••	•••••
Saline	•••••	179	013	806	•••••	•••••	•••••
Sangamon	•••••	•••••	•••••	•••••	8	028	436
Schuylerville	•••••	•••••	•••••	•••••	•••••	•••••	•••••

*Less than .5 psi overpressure

STATE OF ILLINOIS (Continued)

COUNTY	POPULATION	VERY HIGH RISK AREA		HIGH RISK POPULATION AREA		MEDIUM RISK POPULATION AREA		LOW/NO* RISK POPULATION AREA	
		POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Scott	5 978	251*
Shelby	23 698	747*
Stark	6 878	288*
Stephenson	49 795	564		
Tazewell	128 870	650		
Union	18 287	414*
Vermilion	92 625	900*
Wabash	14 342	224		
Warren	21 014	543*
Washington	15 168	563
Wayne	18 799	715*
White		
Whiteside	18 279	497
Will	334 477	844		
Williamson	59 035	427*
Winnebago	249 453	515
Woodford	33 211	527
TOTAL STATE	8 517 316	13 686	68 783	682	297 785	5 417	2 673	372	35 801
							(1 496	597	15 088)
							(1 176	775	20 713)*

*Less than .5 psi overpressure

STATE OF INDIANA -- DIRECT EFFECTS RISK

Estimated 1985 Population: 5,499,636
 Land Area: 35,963 square miles

COUNTY	POPULATION AREA	POPULATION AREA	VERY HIGH RISK	HIGH RISK	MEDIUM RISK	LOW/NO* RISK
			GT 10 PSI	EQ/GT 5PSI LT 10PSI	EQ/GT 2PSI LT 5PSI	EQ/GT • 5PSI LT 2PSI
Adams	•••••	•••••	•••••	•••••	•••••	29 889
Allen	287 909	659	•••••	•••••	•••••	340
Bartholomew	•••••	•••••	•••••	•••••	•••••	64 218
Benton	•••••	•••••	•••••	•••••	•••••	10 004
Blackford	•••••	•••••	•••••	•••••	•••••	15 552
Boone	•••••	•••••	•••••	39 948	424	12 489
Brown	•••••	•••••	•••••	•••••	•••••	312*
Carroll	•••••	•••••	•••••	•••••	•••••	19 420
Cass	89 700	376	•••••	39 602	414	372
Clark	•••••	•••••	•••••	•••••	•••••	•••••
Clay	•••••	•••••	•••••	24 189	360	31 984
Clinton	•••••	•••••	•••••	•••••	•••••	9 847
Crawford	29 889	432	•••••	•••••	•••••	405
Daviess	•••••	•••••	•••••	37 278	307	307*
Dearborn	•••••	•••••	•••••	•••••	•••••	122 300
Decatur	•••••	•••••	•••••	•••••	•••••	373*
De Kalb	•••••	•••••	•••••	•••••	•••••	32 482
Delaware	•••••	•••••	•••••	•••••	•••••	364
Dubois	35 783	429	•••••	•••••	•••••	143 394
Elkhart	•••••	•••••	•••••	•••••	•••••	466
Fayette	•••••	•••••	•••••	63 461	150	27 786
Floyd	•••••	•••••	•••••	•••••	•••••	215*
Fountain	•••••	•••••	•••••	•••••	•••••	18 929
Franklin	•••••	•••••	•••••	•••••	•••••	398*
Fulton	•••••	•••••	•••••	18 858	369	385

*Less than .5 psi overpressure

STATE OF INDIANA (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA
Gibson	34 621	490
Grant	30 483	546	78 305
Greene	415*
Hamilton	90 684	398
Hancock	44 449	307
Harrison	28 777
Hendricks	73 600	409	486
Henry	49 438
Howard	84 640	293
Huntington	34 915
Jackson	37 924
Jasper	514*
Jay	30 439	363	26 785
Jefferson	21 544
Jennings	384*
Johnson	82 426	321	22 737
Knox	43 254	520
Kosciusko	62 293	540
LaGrange	500 016	501	28 018
Lake	380*
La Porte	106 674	600
Lawrence	41 069
Madison	452*
Marion	777 116	396	132 788
Marshall	453
Martin	10 811	339	40 965
Miami	36 512	369	444
Monroe	101 351
Montgomery	53 958	409
Morgan	35 828
			Less than .5 psi overpressure	505

STATE OF INDIANA (Continued)

COUNTY	POPULATION AREA	POPULATION AREA	HIGH RISK AREA	HIGH RISK AREA	MEDIUM RISK AREA		POPULATION AREA	POPULATION AREA	LOW/NO* RISK AREA
					POPULATION AREA	POPULATION AREA			
Newton								14 572	401*
Noble								36 347	413
Ohio								5 153	87
Orange								18 661	408*
Owen								16 529	386*
Parke								16 845	444
Perry	13 173	341						19 057	381*
Pike	126 246	419							
Porter	26 129	410							
Possey									
Pulaski								13 458	435*
Putnam								30 660	482*
Randolph								28 234	454*
Ripley								25 250	447
Rush								18 766	408*
St. Joseph	239 263	459							
Scott								20 313	192
Shelby								40 382	412
Spencer								21 255	400
Starke								20 993	309*
Steuben								25 018	308*
Sullivan								20 798	452
Switzerland	7 626	224							
Tippecanoe									
Tipton								124 393	502*
Union									
Vanderburgh									
Vermillion	109 571	405							
Vigo	34 816	398							
Wabash									

*Less than .5 psi overpressure

STATE OF INDIANA (Continued)

COUNTY	POPULATION AREA	POPULATION AREA	POPULATION AREA	POPULATION AREA	LOW/NO* RISK			
					VERY HIGH RISK	HIGH RISK	MEDIUM RISK	POPULATION AREA
Warren	8	969	366*	
Warrick	45	743	391	
Washington	22	315	516*	
Wayne	72	979	404*	
Wells	24	878	370	
White	23	599	506*	
Whitley	26	512	336	
TOTAL STATE	1 842 108	7 796	----	----	759 597	5 842	2 897 931	22 325 (1 092 641 9 311) (1 805 290 13 014)*

*Less than .5 psi overpressure

STATE OF MICHIGAN -- DIRECT EFFECTS RISK

Estimated 1985 Population: 9,030,778
 Land Area: 57,019 square miles

COUNTY	POPULATION AREA	EQ/GT 10 PSI	HIGH RISK EQ/GT 5PSI LT 10PSI	MEDIUM RISK EQ/GT 2PSI LT 5PSI	POPULATION AREA	EQ/GT • 5PSI LT 2PSI	LOW/NO* RISK	
							POPULATION AREA	POPULATION AREA
Alcona	•••••	•••••	•••••	•••••	•••••	•••••	9 865	679
Alger	•••••	•••••	•••••	•••••	•••••	•••••	8 715	912
Allegan	•••••	•••••	•••••	•••••	•••••	•••••	84 857	832
Alpena	31 164	568	16 919	480	16 919	480	15 260	368
Antrim	•••••	•••••	•••••	•••••	•••••	•••••	8 276	901*
Arenac	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••
Baraga	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••
Barry	•••••	•••••	•••••	•••••	•••••	•••••	46 620	560
Bay	116 484	447	116 484	447	116 484	447	11 105	322*
Benzie	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••
Berrien	160 914	576	160 914	576	160 914	576	38 324	508*
Branch	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••
Calhoun	136 813	712	136 813	712	136 813	712	•••••	•••••
Cass	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••
Charlevoix	19 648	421	19 648	421	19 648	421	•••••	•••••
Cheboygan	•••••	•••••	•••••	•••••	•••••	•••••	20 952	720*
Chippewa	28 740	1 590	28 740	1 590	28 740	1 590	24 955	570*
Clare	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••
Clinton	•••••	•••••	•••••	•••••	•••••	•••••	9 904	559
Crawford	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••
Delta	•••••	•••••	•••••	•••••	•••••	•••••	39 551	1 173
Dickinson	•••••	•••••	•••••	•••••	•••••	•••••	25 983	770
Eaton	•••••	•••••	•••••	•••••	•••••	•••••	89 510	579
Emmet	•••••	•••••	•••••	•••••	•••••	•••••	23 747	468
Genesee	•••••	•••••	•••••	•••••	•••••	•••••	430 014	642

*Less than .5 psi overpressure

STATE OF MICHIGAN (continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA
Gladwin	•••••	•••••	•••••	21 607 505
Gogebic	•••••	•••••	•••••	19 217 1 105*
Grand Traverse	•••••	•••••	•••••	57 547 466*
Gratiot	39 574	570	•••••	41 565 603
Hillsdale	•••••	•••••	•••••	•••••
Houghton	38 148	1 014	•••••	35 867 830*
Huron	•••••	•••••	•••••	•••••
Ingham	270 681	560	•••••	•••••
Ionia	•••••	•••••	•••••	52 503 577
Iosco	30 680	546	•••••	•••••
Iron	•••••	•••••	•••••	14 100 1 163*
Isabella	•••••	•••••	•••••	54 659 576
Jackson	143 728	705	•••••	•••••
Kalamazoo	215 916	562	•••••	•••••
Kalkaska	•••••	•••••	•••••	•••••
Kent	465 963	862	•••••	•••••
Keweenaw	•••••	•••••	2 096 544	•••••
Lake	•••••	•••••	•••••	8 593 568*
Lapeer	•••••	•••••	•••••	68 766 658
Leelanau	•••••	•••••	•••••	14 462 341*
Lenawee	•••••	•••••	•••••	•••••
Livingston	•••••	•••••	•••••	87 729 753
Luce	•••••	•••••	•••••	100 690 575
Mackinac	•••••	•••••	•••••	5 790 905*
Macomb	684 008	483	•••••	10 241 1 025
Manistee	•••••	•••••	•••••	•••••
Marquette	71 997	1 882	•••••	22 152 543*
Mason	•••••	•••••	•••••	26 439 495*
Mecosta	•••••	•••••	•••••	37 282 560*
Menominee	•••••	•••••	•••••	25 896 1 045*

*Less than .5 psi overpressure

STATE OF MICHIGAN (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA
Midland	76 114 525	10 689 565*
Missaukee	130 040 557
Monroe	50 284 713	7 813 550*
Montcalm
Montmorency
Muskegon	155 184 507*	36 547 847*
Newaygo	1 003 070 875
Oakland
Oceana	17 661 569	21 979 541*
Ogemaw
Onitonagon	9 630 1 311*	20 422 569*
Osceola	6 914 568
Oscoda	15 421 516
Otsego
Ottawa	166 497 567
Presque Isle	13 781 656
Roscommon	18 544 528
Saginaw	216 774 815
St. Clair	137 706 734	58 102 503
St. Joseph
Sanilac	39 937 964*
Schoolcraft	8 415 1 173*
Shiawassee	67 929 541
Tuscola	54 830 812
Van Buren	66 432 612
Washtenaw	265 283 710
Wayne	2 148 063 615
Wexford	26 401 566*

TOTAL STATE 5 590 565 16 262 ---- 1 296 474 7 930 2 143 739 32 827
 *Less than .5 psi overpressure (1 424 142 13 629)
 (719 597 19 198)*

STATE OF MINNESOTA -- DIRECT EFFECTS RISK

Estimated 1985 Population: 4,181,231
 Land Area: 79,547 square miles

COUNTY	POPULATION AREA	HIGH RISK			MEDIUM RISK			LOW/NO* RISK		
		GT 10 PSI	EQ/GT 5PSI LT 10PSI	POPULATION AREA	EQ/GT 2PSI LT 5PSI	POPULATION AREA	EQ/GT •5PSI LT 2PSI	POPULATION AREA	EQ/GT 5PSI LT 2PSI	POPULATION AREA
Aitkin	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	13 615	1 834*
Anoka	•••••	•••••	214 648	430	•••••	•••••	•••••	•••••	29 238	1 312*
Becker	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	33 755	2 507*
Beltrami	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	26 710	408*
Benton	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••
Big Stone	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	7 694	497*
Blue Earth	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	51 263	749*
Brown	•••••	•••••	30 176	864	•••••	•••••	•••••	•••••	28 437	610*
Carlton	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••
Carver	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	39 822	351
Cass	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	21 799	2 033*
Chippewa	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	14 480	584*
Chisago	•••••	•••••	48 492	1 049	•••••	•••••	•••••	•••••	28 024	417*
Clay	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••
Clearwater	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	8 958	1 000*
Cook	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	4 068	1 412
Cottonwood	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	14 015	640*
Crow Wing	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	43 714	1 008*
Dakota	•••••	•••••	218 358	575	•••••	•••••	•••••	•••••	•••••	•••••
Dodge	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	15 445	439*
Douglas	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	29 249	644*
Fairbault	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	18 552	714*
Fillmore	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	21 505	862*
Freeborn	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	35 034	705*
Goodhue	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	39 373	763*

*Less than .5 psi overpressure

STATE OF MINNESOTA (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA
Grant	969 049	541	...	6 899 547*
Hennepin	18 852 564*
Houston	14 427 936*
Hubbard	25 121 440*
Isanti
Itasca	42 784 2 661*
Jackson	13 471 699*
Kanabec	12 663 527*
Kandiyohi	38 440 784*
Kittson	6 467 1 104*
Koochiching	16 344 3 108*
Lac Qui Parle	11 624	2 053	...	10 177 772*
Lake
Lake of the Wood	3 775 1 296*
Le Sueur	23 743 446*
Lincoln	7 811 539*
Lyon	25 402 714*
McLeod	30 687 489*
Mahnomen	5 369 559*
Marshall	12 456 1 760
Martin	24 921 706*
Meeker	21 191 624*
Mille Lacs	18 965 578*
Morrison	30 289 1 124*
Mower	39 199 711*
Murray	10 926 702*
Nicollet	27 475 440*
Nobles	21 185 714*
Norman	8 628 877*
Olmsted	97 282 655*

*Less than .5 psi overpressure

STATE OF MINNESOTA (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA	
				POPULATION	AREA
Otter Tail	•••••	•••••	•••••	52	568
Pennington	•••••	•••••	•••••	13	745
Pine	•••••	•••••	•••••	21	028
Pipestone	•••••	•••••	•••••	11	155
Polk	•••••	•••••	33 479	1 981	466*
Pope	•••••	•••••	•••••	11	767
Ramsey	469	833	154	668*	
Red Lake	•••••	•••••	•••••	5	145
Redwood	•••••	•••••	•••••	19	036
Renville	•••••	•••••	•••••	19	875
Rice	•••••	•••••	•••••	47	643
Rock	•••••	•••••	•••••	10	482
Roseau	•••••	•••••	•••••	12	588
St Louis	206	555	6 125	1	677*
Scott	•••••	•••••	•••••	47	955
Sherburne	•••••	•••••	•••••	33	369
Sibley	•••••	•••••	•••••	15	312
Stearns	•••••	•••••	•••••	113	166
Steele	•••••	•••••	•••••	29	841
Stevens	•••••	•••••	•••••	10	574
Swift	•••••	•••••	•••••	12	526
Todd	•••••	•••••	•••••	25	886
Traverse	•••••	•••••	•••••	5	391
Wabasha	•••••	•••••	•••••	19	538
Wadena	•••••	•••••	•••••	13	856
Waseca	•••••	•••••	•••••	18	502
Washington	125	448	390	422*	
Watonwan	•••••	•••••	•••••	12	366
Wilkin	•••••	•••••	•••••	7	996
Winona	•••••	•••••	•••••	46	636

*Less than .5 psi overpressure

STATE OF MINNESOTA (Continued)

COUNTY	HIGH THREAT			MEDIUM THREAT			LOW/NO* THREAT		
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	
Wright	62	769	672
Yellow Medicine	13	155	759*
TOTAL STATE	2 079 535	11 751	214 648	430	73 301	2 332	1 813	747	65 034
							(158	758	6 105)
							(1	654	989 58 929) *

*Less than .5 psi overpressure

STATE OF OHIO - - DIRECT EFFECTS RISK

Estimated 1985 Population: 10,638,633
 Land Area: 41,006 square miles

COUNTY	POPULATION AREA	VERY HIGH RISK			HIGH RISK			MEDIUM RISK			LOW/NO* RISK		
		GT 10 PSI	EQ/GT 5PSI LT	10PSI POPULATION AREA	EQ/GT 2PSI LT	5PSI POPULATION AREA	EQ/GT LT 5PSI POPULATION AREA	EQ/GT • 5PSI LT 2ZPSI AREA	EQ/GT LT POPULATION AREA	EQ/GT 5PSI LT POPULATION AREA	EQ/GT 2PSI LT POPULATION AREA	EQ/GT LT POPULATION AREA	
Adams	24	825	586	
Allen	108	246	405	46	416	424	
Ashland	100	965	703	58	385	508	
Ashtabula	
Athens	
Auglaize	43	248	398	81	529	537	
Belmont	
Brown	
Butler	27	213	393	267	089	465	
Carroll	
Champaign	
Clark	146	853	398	138	508	456	
Clermont	
Clinton	
Columbiana	11	603	534	
Coshocton	36	487	566	
Crawford	1	451	046	459	53	525	606	
Cuyahoga	
Darke	
Defiance	
Delaware	
Erie	
Fairfield	
Fayette	899	877	542	
Franklin	

*Less than .5 psi overpressure

STATE OF OHIO (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA		HIGH RISK POPULATION AREA		MEDIUM RISK POPULATION AREA		LOW/NO* RISK POPULATION AREA	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Fulton	38	575	407					
Gallia	30	92	471					
Geauga	•••••	•••••	•••••	•••••	•••••	•••••	75	013
Greene	129	410	415					
Guernsey	•••••	•••••	•••••	•••••	•••••	•••••	41	304
Hamilton	861	633	412					
Hancock	64	917	532					
Hardin	•••••	•••••	•••••	•••••	•••••	•••••	31	387
Harrison	•••••	•••••	•••••	•••••	•••••	•••••	16	159
Henry	•••••	•••••	•••••	•••••	28	187	415	400
Highland	•••••	•••••	•••••	•••••	•••••	•••••	34	376
Hocking	•••••	•••••	•••••	•••••	•••••	•••••	24	746
Holmes	•••••	•••••	•••••	•••••	•••••	•••••	30	289
Huron	•••••	•••••	•••••	•••••	•••••	•••••	55	072
Jackson	•••••	•••••	•••••	•••••	•••••	•••••	29	753
Jefferson	86	780	410					
Knox	•••••	•••••	•••••	•••••	•••••	•••••	47	613
Lake	216	175	231					
Lawrence	62	576	456					
Licking	•••••	•••••	•••••	•••••	124	764	686	
Logan	•••••	•••••	•••••	•••••	•••••	•••••	39	597
Lorain	270	340	495					
Lucas	462	017	341					
Madison	•••••	•••••	•••••	•••••	•••••	•••••	34	949
Mahoning	•••••	•••••	•••••	•••••	279	136	417	467
Marion	•••••	•••••	•••••	•••••	•••••	•••••	66	049
Medina	•••••	•••••	•••••	•••••	116	655	422	
Meigs	•••••	•••••	23	696	432			
Mercer	•••••	•••••	•••••	•••••	38	647	457	
Miami	•••••	•••••	•••••	•••••	•••••	•••••	88	976
								410

*Less than .5 psi overpressure

STATE OF OHIO (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA
Monroe	16 091	458
Montgomery	561 738	458
Morgan	14 056
Morrow	26 564
Muskingum	84 376	654	406
Noble	11 231
Ottawa	39 633
Paulding	20 507
Perry	419*
Pickaway	31 855
Pike	24 296	443	412*
Portage	137 910
Preble	38 517
Putnam	128 552	497	426
Richland	42 544	503
Ross	33 276
Sandusky	61 918	409	484
Scioto
Seneca	61 233	553
Shelby	43 360	409
Stark	376 852	574	68 139
Summit	509 599	412	692
Trumbull	235 536	612
Tuscarawas
Union	31 017
Van Wert	569
Vinton	437
Warren
Washington	64 922	640	29 833
Wayne	100 270	410
			557	11 473
				103 313
				414
				403

*Less than .5 psi overpressure

STATE OF OHIO (Continued)

COUNTY	POPULATION AREA	POPULATION AREA	HIGH RISK AREA	HIGH RISK	MEDIUM RISK		LOW/NO* RISK	
					POPULATION AREA	POPULATION AREA	POPULATION AREA	POPULATION AREA
Williams	36	158
Wood	108	636	619	422*	
Wyandot	22	355
TOTAL STATE	6 496	446	12 365	850 066	4 999	1 487 248	6 027	1 804 873
							(1 307	105 12 099)
							(497	768 5 516)*

*Less than .5 psi overpressure

S T A T E O F W I S C O N S I N - - D I R E C T E F F E C T S R I S K

Estimated 1985 Population: 4,779,553
 Land Area: 54,424 square miles

C O U N T Y	P O P U L A T I O N A R E A	H I G H R I S K			M I D D L E R I S K			L O W / N O * R I S K		
		G T 1 0 P S I	E Q / G T 5 P S I	L T 1 0 P S I	E Q / G T 2 P S I	L T 5 P S I	P O P U L A T I O N A R E A	P O P U L A T I O N A R E A	P O P U L A T I O N A R E A	E Q / G T • 5 P S I
Adams								13	859	648*
Ashland								17	248	1 048*
Barron								39	553	865*
Bayfield								14	400	1 462*
Brown								182	756	524*
Buffalo								14	572	699*
Burnett								13	869	818*
Calumet								33	511	326*
Chippewa								53	660	1 017*
Clark								34	020	1 218*
Columbia								44	916	771
Crawford								16	679	566*
Dane	335	264	1	205						
Dodge								76	135	887*
Door								26	236	492*
Douglas	43	876	1	305						
Dunn								34	908	853*
Eau Claire								83	603	638*
Florence								4	025	486*
Fond du Lac								89	789	725*
Forest								9	364	1 011*
Grant								51	842	1 144*
Green								30	446	583
Green Lake								19	281	357*
Iowa								20	743	760*

*Less than .5 psi overpressure

STATE OF WISCONSIN (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA
Iron	6 280 751*
Jackson	16 607 998
Jefferson	21 336	774	66 968 562*
Juneau
Kenosha	120 916	273
Kewaunee	93 613 457	20 184 343*
La Crosse	17 175 634*
LaFayette	20 122 873*
Langlade	28 174 886*
Lincoln
Manitowoc	83 201 594*
Marathon	112 970 1 559*
Marinette	40 352 1 395*
Marquette	12 737 454*
Menominee	3 832 359*
Milwaukee	951 403	241
Monroe	36 025	904	30 044 1 002*
Oconto	31 238 1 130*
Oneida	133 891 642*
Outagamie
Ozaukee	67 465 235
Pepin	7 643 231*
Pierce	32 390 576
Polk	34 191 919*
Portage	57 011 810*
Price	16 777 1 256*
Racine	173 954	334
Richland	17 627 585*
Rock	138 419 724
Rusk	16 110 913*

*Less than .5 psi overpressure

STATE OF WISCONSIN (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA
				POPULATION
St Croix	•	•	•	45 277 723
Sauk	•	•	•	44 873 838
Sawyer	•	•	•	14 310 1 255*
Shawano	•	•	•	36 820 897*
Sheboygan	•	•	•	102 389 515*
Taylor	•	•	•	18 660 975*
Trempealeau	•	•	•	26 132 736*
Vernon	•	•	•	26 772 808
Villas	•	•	•	17 750 867*
Walworth	•	•	•	70 757 556*
Washburn	•	•	•	13 767 815*
Washington	•	•	•	87 947 431
Waukesha	•	•	•	286 077 554
Waupaca	•	•	•	43 959 754*
Waushara	•	•	•	19 321 628*
Winnebago	•	•	•	133 994 449*
Wood	•	•	•	77 538 801*
TOTAL STATE	1 561 858	4 762	120 916 273	96 613 457 3 000 166 48 931 (821 189 7 241) (2 178 977 41 960)*

*Less than .5 psi overpressure

F E M A R E G I O N V I - - D I R E C T E F F E C T S R I S K S U M M A R Y

		Estimated 1985 Population: 28,140,362			Land Area: 548,583 square miles			HIGH RISK			MEDIUM RISK			LOW/NO* RISK		
STATE	POPULATION AREA	EQ/GT 10 PSI AREA	EQ/GT 5 PSI LT POPULATION AREA	EQ/GT 10PSI AREA	EQ/GT 2 PSI POPULATION AREA	EQ/GT 5 PSI LT POPULATION AREA	EQ/GT 2 PSI AREA	EQ/GT 5 PSI LT POPULATION AREA	EQ/GT 2 PSI AREA	EQ/GT 5 PSI LT POPULATION AREA	EQ/GT 2 PSI AREA	EQ/GT 5 PSI LT POPULATION AREA	EQ/GT 2 PSI AREA	EQ/GT 5 PSI LT POPULATION AREA	EQ/GT 2 PSI AREA	
Arkansas	684 065	5 881	122 524	3 100	126 318	3 882	1	430 734	39 219	(143 121	2 924)	(1 287 613	36 295)*			
Louisiana	2 874 344	15 620	---	---	241 823	3 988	1	408 852	24 912	(521 728	8 284)	(887 124	16 628)*			
New Mexico	1 096 156	40 531	---	---	17 008	2 453	1	347 619	78 352	(159 355	17 476)	(188 264	60 876)*			
Oklahoma	2 162 942	17 312	72 149	930	186 705	7 887	1	943 123	42 527	(487 142	20 080)	(455 981	22 447)*			
Texas	11 956 816	45 954	43 175	1 098	1 081 754	19 826	3	344 255	195 111	(1 536 202	49 915)	(1 808 053	145 196)*			
TOTAL REGION VI	18 774 323	125 298	237 848	5 128	1 653 608	38 036	7	474 583	380 121	(2 847 548	98 679)	(4 627 035	281 442)*			

*Less than .5 psi overpressure

S T A T E O F A R K A N S A S - - D I R E C T E F F E C T S R I S K

Estimated 1985 Population: 2,363,641
 Land Area: 52,082 square miles

COUNTY	POPULATION AREA	VERY HIGH RISK			HIGH RISK			MEDIUM RISK			LOW/NO* RISK									
		GT	10	PSI	EQ/GT	5PSI	LT	10PSI	EQ/GT	2PSI	LT	5PSI	EQ/GT	•5PSI	LT	2PSI	POPULATION AREA	POPULATION AREA	POPULATION AREA	
Arkansas																	24	025	1	006*
Ashley																	26	615	9	34*
Baxter																	30	117	5	46*
Benton																	86	071	8	44*
Boone																	28	115	5	84*
Bradley																	13	434	6	54*
Calhoun									6	162	629						17	597	6	34*
Carroll																	18	017	6	49*
Chicot																	23	166	8	67*
Clark																				
Clay																				
Cleburne																				
Cleveland																				
Columbia																				
Conway																				
Craighead																				
Crawford																				
Crittenden																				
Cross																				
Dallas																				
Deshaw																				
Drew																				
Faulkner																				
Franklin																				
Fulton																				

*Less than .5 psi overpressure

STATE OF ARKANSAS (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	POPULATION AREA	MEDIUM RISK		POPULATION AREA	POPULATION AREA	LOW/NO* RISK POPULATION AREA
				POPULATION	AREA			
Garland	•••••	•••••	•••••	74	774*	74	774*	657*
Grant	•••••	•••••	•••••	13	183	13	183	633*
Greene	•••••	•••••	•••••	31	370	31	370	578*
Hempstead	•••••	•••••	•••••	23	615	23	615	725*
Hot Spring	•••••	•••••	•••••	27	264	27	264	615*
Howard	•••••	•••••	•••••	13	584	13	584	574*
Independence	•••••	•••••	•••••	32	517	32	517	763*
Izard	•••••	•••••	•••••	11	018	11	018	581*
Jackson	•••••	•••••	•••••	21	479	21	479	633*
Jefferson	90 496	882	•••••	18	525	18	525	676
Johnson	•••••	•••••	•••••	10	093	10	093	518*
LaFayette	•••••	•••••	•••••	18	546	18	546	589*
Lawrence	•••••	•••••	•••••	15	391	15	391	602*
Lee	•••••	•••••	•••••	13	046	13	046	563*
Lincoln	•••••	•••••	•••••	14	145	14	145	516*
Little River	•••••	•••••	•••••	20	662	20	662	717
Logan	•••••	•••••	•••••	11	851	11	851	837*
Lonoke	•••••	•••••	•••••	12	601	12	601	587*
Madison	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••
Marion	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••
Miller	•••••	•••••	39 656	619	•••••	•••••	•••••	•••••
Mississippi	59 199	897	•••••	•••••	13 383	13 383	609*	609*
Monroe	•••••	•••••	•••••	•••••	7 782	7 782	775*	775*
Montgomery	•••••	•••••	•••••	10 970	620	•••••	•••••	•••••
Nevada	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••
Newton	•••••	•••••	•••••	•••••	8 207	8 207	823*	823*
Ouachita	33 443	737	•••••	•••••	7 924	7 924	551*	551*
Perry	•••••	•••••	•••••	•••••	33 653	33 653	685*	685*
Phillips	•••••	•••••	•••••	•••••	10 051	10 051	598*	598*
Pike	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••

*Less than .5 psi overpressure

STATE OF ARKANSAS (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA		HIGH RISK POPULATION AREA		MEDIUM RISK POPULATION AREA		LOW/NO* RISK POPULATION AREA	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Poinsett							25 939	762*
Polk							17 508	860*
Pope	42	387	820					
Prairie							10 052	656*
Pulaski	352	946	767					
Randolph							16 315	656*
St Francis	56	244	725				31 547	639
Saline								
Scott							9 906	897*
Searcy							8 941	668*
Sebastian							97 960	535*
Sevier							14 471	560*
Sharp							15 673	606*
Stone	49	350	1 053				9 766	606*
Union								
Van Buren							15 337	709*
Washington							104 872	951*
White							52 827	1 040
Woodruff							10 516	592*
Yell			18 140	931				
TOTAL STATE	684 065	5 881	122 524	3 100	126 318	3 882	1 430 734	39 219
							(143 121	2 924)
							(1 287 613	36 295)*

*Less than .5 psi overpressure

STATE OF LOUISIANA -- DIRECT EFFECTS RISK

Estimated 1985 Population: 4,525,019
 Land Area: 44,520 square miles

COUNTY	POPULATION AREA	HIGH RISK			MEDIUM RISK			LOW/NO* RISK		
		GT 10 PSI	EQ/GT 5PSI	LT 10PSI	EQ/GT 2PSI	LT 5PSI	EQ/GT • 5PSI	POPULATION AREA	POPULATION AREA	EQ/GT LT AREA
Acadia	59 861	657	21 908	766	
Allen	58 862	296	23 808	342	43 773	846*	
Ascension	
Assumption	
Avoyelles	
Beauregard	32 564	1 163	
Bienville	90 980	845	16 855	815	
Bossier	276 755	894	
Caddo	276 755	894	
Calcasieu	176 853	1 081	
Caldwell	11 466	541*	
Cameron	10 180	1 417	12 760	732*	
Catahoula	18 483	765	
Claiborne	23 966	717*	
Concordia	
De Soto	397 601	458	27 693	880	
East Baton Rouge	
East Carroll	11 376	426*	
East Feliciana	20 727	455	
Evangeline	35 372	667	
Franklin	24 409	636*	
Grant	18 370	653	
Iberia	33 300	637	70 124	589*	
Iberville	
Jackson	17 125	578*	

*Less than .5 psi overpressure

STATE OF LOUISIANA (Continued)

COUNTY	POPULATION AREA	HIGH RISK AREA	POPULATION AREA	MEDIUM RISK AREA	POPULATION AREA	LOW/NO* RISK AREA
Jefferson	479 824	347				
Jefferson Davis	33 174	655				
LaFayette	89 854	1 141				
LaFourche						
LaSalle						
Lincoln				43 102	472	
Livingston						71 703
Madison						15 430
Morehouse						35 796
Natchitoches						40 047
Orleans	559 384	199				
Ouachita						143 485
Plaquemines	26 882	1 035				627*
Pointe Coupee	24 933	566				
Rapides	139 793	1 341				
Red River						
Richland						
Sabine						
St Bernard	68 168	486				
St Charles	42 789	286				
St Helena						
St James	22 121	248				
St John Baptist	41 836	213				
St Landry	90 161	936				
St Martin						
St Mary						
St Tammany				142 182	873	
Tangipahoa						93 622
Tensas						8 292
Terrebonne						103 873

*Less than .5 psi overpressure

STATE OF LOUISIANA (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA
Union	22 551	884
Vermilion	62 258	1 332	54 232 1 205
Washington	45 935	602	46 376 676*
Webster				
West Baton Rouge	20 678	194	13 224 360*
West Carroll	13 859	406	17 660 953*
West Feliciana				
Winn				
TOTAL STATE	2 874 344	15 620	---	241 823 3 988 1 408 852 24 912 (521 728 8 284) (887 124 16 628)*

*Less than .5 psi overpressure

S T A T E O F N E W M E X I C O - - D I R E C T E F F E C T S R I S K

Estimated 1985 Population: 1,460,783
 Land Area: 121,336 square miles

COUNTY	POPULATION AREA	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW/NO* RISK	
		GT 10 PSI	EQ/GT 5PSI LT POPULATION AREA	EQ/GT 5PSI LT POPULATION AREA	EQ/GT 2PSI LT POPULATION AREA	EQ/GT 5PSI LT POPULATION AREA	EQ/GT 2PSI LT POPULATION AREA	EQ/GT 5PSI LT POPULATION AREA	EQ/GT 2PSI LT POPULATION AREA
Bernalillo	456 640	1 169	2 781	6 929*
Catron	60 404	6 066	13 280	3 762*
Chaves
Colfax	44 347	1 408
Curry	2 278	2 323*
DeBaca
Dona Ana	116 120	3 819	27 992	3 969*
Eddy	55 403	4 184	4 448	3 032*
Grant
Guadalupe
Harding	946	2 122*
Hidalgo	68 068	4 390	6 462	3 445*
Lea
Lincoln	14 173	4 832*
Los Alamos	19 396	109
Luna	16 846	2 965*
McKinley	62 558	5 442
Mora	50 681	6 626	4 909	1 930*
Otero	10 634	2 874*
Quay
Rio Arriba	32 805	5 856*
Roosevelt	17 008	2 453
Sandoval	35 678	3 707
San Juan	99 037	5 522
San Miguel	24 909	4 709

*Less than .5 psi overpressure

STATE OF NEW MEXICO (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA		HIGH RISK POPULATION AREA		MEDIUM RISK POPULATION AREA		LOW/NO* RISK POPULATION AREA	
Santa Fe	82	898	1	905				
Sierra	9	058
Socorro	15	027
Taos	21	094
Torrance	8	397
Union	5	531
Valencia	70	975

TOTAL STATE	VERY HIGH RISK POPULATION AREA		HIGH RISK POPULATION AREA		MEDIUM RISK POPULATION AREA		LOW/NO* RISK POPULATION AREA	
	1	096	156	40	531	----	17	008
						2	453	
								347
								619
								78
								352

(159 355 17 476)
(188 264 60 876)*
*Less than .5 psi overpressure

STATE OF OKLAHOMA -- DIRECT EFFECTS RISK

COUNTY	VERY HIGH RISK			HIGH RISK			MEDIUM RISK			LOW/NO* RISK		
	POPULATION AREA	GT 10 PSI	EQ/GT 5PSI LT	10PSI	EQ/GT 2PSI	LT	5PSI	EQ/GT	LT	5PSI	EQ/GT	LT
Adair	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	20	474
Alfalfa	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	7	148
Atoka	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	13	806
Beaver	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	980	
Beckham	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••		
Blaine	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	28	439
Bryan	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	904	
Caddo	34	998	1	286	•••••	•••••	•••••	•••••	•••••	•••••		
Canadian	71	951	902	902	•••••	•••••	•••••	•••••	•••••	•••••	14	513
Carter	47	692	827	827	•••••	•••••	•••••	•••••	•••••	•••••	32	184
Cherokee	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	920*	
Choctaw	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	902*	
Cimarron	160	572	529	529	•••••	•••••	•••••	•••••	•••••	•••••	4	046
Cleveland	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	1	842*
Coal	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	5	816
Comanche	121	146	1	076	•••••	•••••	•••••	•••••	•••••	•••••	520*	
Cotton	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	6	987
Craig	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	15	333
Creek	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	763*	
Custer	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	36	008
Delaware	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	981	
Dewey	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	28	310
Ellis	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	1	721
Garfield	66	024	1	060	•••••	•••••	•••••	•••••	•••••	•••••	6	483
Garvin	31	029	813	813	•••••	•••••	•••••	•••••	•••••	•••••	1	232

*Less than .5 psi overpressure

STATE OF OKLAHOMA (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA
Grady	46	202	1 106	6 713 1 004
Grant	•••••	•••••	•••••	7 290 638
Greer	•••••	•••••	•••••	4 422 537*
Harmon	•••••	•••••	•••••	4 839 1 039
Harper	•••••	•••••	•••••	11 927 570*
Haskell	•••••	•••••	•••••	15 085 805
Hughes	30 803	817	•••••	•••••
Jackson	•••••	•••••	•••••	•••••
Jefferson	•••••	•••••	•••••	8 759 769
Johnston	•••••	•••••	10 912 639	•••••
Kay	•••••	•••••	53 759 921	•••••
Kingfisher	•••••	•••••	•••••	16 877 906*
Kiowa	•••••	•••••	•••••	12 812 1 019
Latimer	•••••	•••••	•••••	10 152 728*
Le Flore	•••••	•••••	•••••	43 438 1 585*
Lincoln	30 539	964	•••••	•••••
Logan	•••••	•••••	•••••	31 357 748
Love	•••••	•••••	•••••	8 154 519
McClain	•••••	•••••	25 247 581	•••••
McCurtain	•••••	•••••	•••••	35 933 1 826*
McIntosh	•••••	•••••	•••••	17 305 599
Major	•••••	•••••	•••••	9 516 958
Marshall	•••••	•••••	11 460 372	•••••
Mayes	•••••	•••••	•••••	35 187 644*
Murray	•••••	•••••	13 473 420	•••••
Muskogee	70 748	815	•••••	•••••
Noble	•••••	•••••	•••••	12 129 736*
Nowata	11 552	541	•••••	•••••
Okfuskee	•••••	•••••	•••••	•••••
Oklahoma	635 696	708	•••••	12 082 628

*Less than .5 psi overpressure

STATE OF OKLAHOMA (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA			HIGH RISK POPULATION AREA			MEDIUM RISK POPULATION AREA			LOW/NO* RISK POPULATION AREA	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	POPULATION	AREA
Oklmulgee	40	403	698	42	658	2 264*
Osage	33	882	465
Ottawa	17	176	551
Pawnee
Payne	65	992	691
Pittsburg	43	109	1 251*
Pontotoc	34	762	717
Pottawatomie	62	945	783
Pushmataha	11	880	1 417*
Roger Mills	6	385	1 146
Rogers	56	007	683
Seminole	29	055	639	33	645	678*
Sequoyah
Stephens	46	259	885	18	201	2	040
Texas	11	650	904
Tillman
Tulsa	519	654	571
Wagoner	52	032	559	52	984	423
Washington
Washita	17	419	1 006
Woods	10	827	1 291*
Woodward	23	371	1 242
TOTAL STATE	2 162	942	17 312	72	149	930	186	705	7	887	(943 123 42 527
											(487 142 20 080)
											(455 981 22 447)*

*Less than .5 psi overpressure

STATE OF TEXAS - - DIRECT EFFECTS RISK

Estimated 1985 Population: 16,426,000
 Land Area: 261,989 square miles

COUNTY	POPULATION AREA	POPULATION AREA	VERY HIGH RISK	HIGH RISK	MEDIUM RISK	LOW/NO* RISK
			GT 10 PSI	EQ/GT 5PSI LT 10PSI	EQ/GT 2PSI LT 5PSI	EQ/GT • 5PSI LT 2PSI
Anderson	•••••	•••••	•••••	•••••	•••••	47 651 1 077*
Andrews	•••••	•••••	•••••	•••••	•••••	16 609 1 501*
Angelina	•••••	•••••	•••••	•••••	•••••	69 361 807*
Aransas	•••••	•••••	•••••	•••••	•••••	17 801 280
Archer	•••••	•••••	•••••	•••••	•••••	8 179 907
Armstrong	•••••	•••••	•••••	1 937 910	•••••	•••••
Atascosa	•••••	•••••	•••••	•••••	•••••	28 715 1 218
Austin	•••••	•••••	•••••	•••••	•••••	21 150 656
Bailey	•••••	•••••	•••••	•••••	•••••	8 227 827
Bandera	•••••	•••••	•••••	•••••	•••••	8 732 793*
Bastrop	•••••	•••••	32 710 895	•••••	•••••	•••••
Baylor	•••••	•••••	•••••	•••••	•••••	5 126 862*
Bee	29 378 880	•••••	•••••	•••••	•••••	•••••
Bell	169 465 1 055	•••••	•••••	•••••	•••••	•••••
Bexar	1 117 869 1 248	•••••	•••••	•••••	•••••	•••••
Blanco	•••••	•••••	•••••	•••••	•••••	5 508 714*
Borden	•••••	•••••	•••••	•••••	•••••	1 003 900*
Bosque	•••••	•••••	•••••	•••••	•••••	14 289 989
Bowie	80 151 891	•••••	•••••	•••••	•••••	•••••
Brazoria	190 191 1 407	•••••	•••••	•••••	•••••	•••••
Brazos	•••••	•••••	•••••	•••••	•••••	123 285 588
Brewster	•••••	•••••	•••••	•••••	•••••	8 213 6 169*
Briscoe	•••••	•••••	•••••	•••••	•••••	2 266 887*
Brooks	•••••	•••••	•••••	•••••	•••••	9 279 942*
Brown	•••••	•••••	•••••	•••••	•••••	36 336 936*

*Less than .5 psi overpressure

STATE OF TEXAS (Continued)

COUNTY	POPULATION	VERY HIGH RISK AREA		HIGH RISK AREA		POPULATION AREA		POPULATION AREA		LOW/NO* RISK POPULATION AREA	
		POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Burleson	•••••									15 837	668
Burnet	•••••									22 587	994
Caldwell	27 133	546									
Calhoun	22 997	540									
Callahan	•••••									13 009	899
Cameron	248 893	905									
Camp	•••••	7 188	924	10 465	203						
Carson	•••••										
Cass	•••••									30 977	937
Castro	•••••									10 177	899*
Chambers	20 132	616									
Cherokee	•••••									39 769	1 052
Childress	•••••									6 452	707*
Clay	•••••					9 871	1 085				
Cochran	•••••									4 732	775*
Coke	•••••									3 706	908*
Coleman	•••••									10 468	1 277*
Collin	•••••					187 101	851				
Collingsworth	•••••									4 072	909*
Colorado	•••••									20 306	964*
Comal	•••••							44 827	555		
Comanche	•••••									13 217	930*
Concho	•••••									2 977	992*
Cooke	•••••									29 097	893*
Coryell	58 932	1 057									
Cottle	•••••									2 633	895*
Crane	•••••									5 350	782
Crockett	•••••									5 035	2 806*
Crosby	•••••									8 432	898
Culberson	•••••									3 509	3 815*

*Less than .5 psi overpressure

STATE OF TEXAS (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA
Dallam	1 765 074	880		6 796 1 505*
Dallas				
Dawson				17 059 903*
Deaf Smith				20 205 1 497*
Delta				4 944 279*
Denton			174 001 911	
De Witt				20 656 910
Dickens				3 090 907*
Dimmit	12 065	1 307		
Donley				4 208 929*
Duval				
Eastland				13 548 1 795*
Ector	151 738	903		21 466 924*
Edwards				
Ellis				2 168 2 102*
El Paso	538 075	1 014		69 192 939
Erath				
Falls				24 905 1 080*
Fannin				18 274 770
Fayette				24 681 895
Fisher				20 407 950
Floyd				
Foard				5 741 897*
Fort Bend	191 398	876		8 802 992*
Franklin				1 849 703*
Freestone				
Frio				17 218 888*
Gaines				14 644 1 133*
Galveston	220 241	399		14 581 1 504*
Garza				

*Less than .5 psi overpressure

STATE OF TEXAS (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA
Gillespie	15 622 1 061*
Glasscock	1 251 900*
Goliad	19 081 1 068	5 897 859	
Gonzales	27 503 921	
Gray	95 891 934*
Grayson	
Gregg	114 058 273	
Grimes	17 968 799*
Guadalupe	54 862 713	
Hale	37 243 1 005
Hall	4 963 876*
Hamilton	8 136 836*
Hansford	6 590 921*
Hardeman	6 589 688*
Hardin	44 075 898	
Harris	2 831 639 1 734	
Harrison	58 471 908	
Hartley	3 633 1 462*
Haskell	7 515 901*
Hays	51 765 678
Hemphill	6 418 903*
Henderson	52 080 888*
Hidalgo	350 518 1 569	
Hill	27 335 968*
Hockley	24 809 908	
Hood	25 815 425*
Hopkins	28 369 789
Houston	23 673 1 234*
Howard	38 311 901*
Hudspeth	2 620 4 566*

*Less than .5 psi overpressure

STATE OF TEXAS (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA			HIGH RISK POPULATION AREA			MEDIUM RISK POPULATION AREA			LOW/NO* RISK POPULATION AREA		
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Hunt	65	278	840								1 800	1 052*
Hutchinson	30	287	871								7 639	920
Irion												
Jack												
Jackson							13 946	844				
Jasper							32 469	921			1 770	2 258*
Jeff Davis	260	403	937									
Jefferson											5 464	1 136*
Jim Hogg											40 710	867
Jim Wells												
Johnson											85 375	731
Jones							13 498	753			18 960	931
Karnes												
Kaufman											49 484	788
Kendall											13 788	663*
Kenedy												
Kent											485	1 389*
Kerr											1 100	878*
Kimble											33 638	1 107*
King											4 297	1 250*
											430	914*
Kinney											2 407	1 359
Kleberg	34	983	853									
Knox											5 583	845*
Lamar											44 953	919*
Lamb											17 077	1 013
Lampasas											13 753	714
La Salle											5 960	1 517*
Lavaca											18 238	971
Lee											14 220	631*
Leon											11 710	1 078*

*Less than .5 psi overpressure

STATE OF TEXAS (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA
Liberty	55 859	1 174
Limestone	21 699	931*
Lipscomb	4 310	933*
Live Oak	9 872 1 057	
Llano	12 072	939	75 671*
Loving	
Lubbock	220 637 900	
Lynn	7 834	888
McCulloch	8 849	1 071*
McLennan	184 912 1 031	
McMullen	934 1 163	
Madison	12 236	473*
Marion	10 734 385	
Martin	5 451	914*
Mason	3 526	934*
Matagorda	37 618 1 127	
Maverick	36 420	1 287
Medina	25 049	1 331
Menard	2 408	902*
Midland	121 309 902	
Milam	23 556 1 019	
Mills	4 590	748*
Mitchell	9 286	912*
Montague	18 758	928*
Montgomery	168 161 1 047	
Moore	17 728	905
Morris	15 523 256	
Motley	1 820	959*
Nacogdoches	51 584	939*
Navarro	39 336	1 068*

*Less than .5 psi overpressure

STATE OF TEXAS (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA
Newton	13 436 935
Nolan	18 011 915
Nueces	305 867	847
Ochiltree	11 484 919*
Oldham	2 436 1 485
Orange	91 432	362
Palo Pinto	23 148	812	26 766 949
Panola
Parker	54 135 902
Parmer	10 776 885
Pecos
Polk	108 666	902	17 658 4 76*
Potter	30 680 1 061*
Presidio
Rains	5 405 3 857*
Randall	85 692 917	5 979 243
Reagan
Real
Red River	9 225 771
Reeves	1 062 915*
Refugio
Roberts	16 266	864	15 924 2 626*
Robertson
Rockwall	20 181 128
Runnels	12 504 1 056
Rusk	44 629	932
Sabine	9 975 486*
San Augustine	8 887 524*
San Jacinto	14 075 572*
San Patricio	64 171	693

*Less than .5 psi overpressure

STATE OF TEXAS (Continued)

COUNTY	POPULATION AREA	HIGH RISK AREA		MEDIUM RISK AREA		POPULATION AREA	LOW/NO* RISK AREA
		POPULATION	AREA	POPULATION	AREA		
San Saba	6 003	1 136*
Schleicher	3 314	1 309*
Scurry	20 589	900*
Shackelford	4 096	915*
Shelby	24 040	791*
Sherman	3 235	923*
Smith	148 646	932	4 528	188*
Somervell	33 795	1 226*
Starr	10 829	894
Stephens
Sterling	1 641	923*
Stonewall	2 466	925*
Sutton	5 948	1 455*
Swisher	8 860	902*
Tarrant	1 047 540	868
Taylor	126 136	917	1 465	2 357*
Terrell	15 475	886*
Terry	2 384	912*
Throckmorton
Titus	23 389	412
Tom Green	98 791	1 515
Travis	518 971	989	11 631	692*
Trinity	18 854	922*
Tyler	33 233	587
Upshur
Upton	5 783	1 243
Uvalde	24 016	1 564
Val Verde	41 253	3 150
Van Zandt	37 028	855
Victoria	75 901	887

*Less than .5 psi overpressure

STATE OF TEXAS (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA
Walker	52 221 786*
Waller	24 262 514*
Ward	16 495 836*
Washington	25 426 610*
Webb	122 888 3 363*
Wharton	41 409 1 086
Wheeler	127 426 606	8 502 905*
Wichita	16 904 947*
Wilbarger	18 857 589
Willacy
Williamson	101 812 1 137
Wilson	18 710 807
Winkler	11 236 840*
Wise	31 679 902
Wood	27 986 689
Yoakum	9 654 800*
Young	20 063 919
Zapata	8 344 999*
Zavala	12 247 1 289
TOTAL STATE	111 956 816 45 954	43 175 1 098 1 081 754	19 826	3 344 255 195 111 (1 536 202 49 915) (1 808 053 145 196)*

*Less than .5 psi overpressure

F E M A R E G I O N V I I - - D I R E C T E F F E C T S R I S K S U M M A R Y

STATE	POPULATION AREA	POPULATION	GT 10 PSI	HIGH RISK EQ/GT 5PSI LT 10PSI	HIGH RISK EQ/GT 5PSI LT 10PSI	MEDIUM RISK EQ/GT 2PSI LT 5PSI	MEDIUM RISK EQ/GT 2PSI LT 5PSI	LOW/NO* RISK	
								POPULATION AREA	POPULATION AREA
Iowa	960 992	5 919	---	---	88 306	953	1 857 641	49 092	
Kansas	1 241 903	14 109	311 640	2 946	74 253	3 488	(312 608	7 716)	(1 545 033 41 376)*
Missouri	3 023 895	14 553	56 232	1 140	340 392	3 831	827 137	61 249	(363 362 17 582)
Nebraska	420 964	7 770	11 353	2 158	448 230	2 078	(463 775	43 667)*	(1 249 456 38 231)*
TOTAL REGION VII	5 647 754	42 351	379 225	6 244	951 181	10 350	4 967 080	224 026	
							(1 054 037	41 287)	
							(3 913 043	182 739)*	

*Less than .5 psi overpressure

STATE OF IOWA -- DIRECT EFFECTS RISK

Estimated 1985 Population: 2,906,939
 Land Area: 55,964 square miles

COUNTY	POPULATION AREA	HIGH RISK			MEDIUM RISK			LOW/NO* RISK		
		GT 10 PSI	EQ/GT 5PSI	LT 10PSI	EQ/GT 2PSI	LT 5PSI	EQ/GT • 5PSI	LT 2PSI	POPULATION AREA	POPULATION AREA
Adair	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	9 171	569*
Adams	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	5 535	425*
Allamakee	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	15 188	633*
Appanoose	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	14 710	498*
Audubon	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	8 169	444*
Benton	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	22 898	719
Black Hawk	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	136 865	573*
Boone	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	25 946	573*
Bremer	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	24 669	439*
Buchanan	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	22 900	572*
Buena Vista	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	21 016	575*
Butler	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	17 310	582*
Calhoun	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	12 866	571*
Carroll	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	22 915	570*
Cass	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	17 077	565*
Cedar	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	18 790	582*
Cerro Gordo	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	48 580	569*
Cherokee	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	15 621	577*
Chickasaw	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	15 018	505*
Clarke	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	8 787	431*
Clay	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	19 165	569*
Clayton	•••••	55 532	695	•••••	•••••	•••••	•••••	•••••	21 245	778*
Clinton	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	19 448	714*
Crawford	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	29 750	591
Dallas	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••

*Less than .5 psi overpressure

STATE OF IOWA (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA
Davis	9 276 504*
Decatur	9 232 535*
Delaware	44 964	414	19 169 578*
Des Moines	15 710 381*
Dickinson
Dubuque	91 209 607*
Emmet	12 838 394*
Fayette	24 668 731*
Floyd	18 980 502*
Franklin	12 521 583*
Fremont	9 238 515
Greene	11 579 571*
Grundy	13 743 501*
Guthrie	11 507 590*
Hamilton	17 290 576*
Hancock	13 559 571*
Hardin	21 564 569*
Harrison	15 855 698
Henry	18 755 436
Howard	10 877 473*
Humboldt	11 972 437*
Ida	8 852 432*
Iowa	22 405	638	15 135 587
Jackson
Jasper	36 039 731*
Jefferson	16 445 440*
Johnson	85 664 614
Jones	20 530 576*
Keokuk	12 511 580*
Kossuth	21 303 974*

*Less than .5 psi overpressure

STATE OF IOWA (Continued)

COUNTY	VERY HIGH RISK	HIGH RISK	MEDIUM RISK	LOW/NO* RISK
	POPULATION	AREA	POPULATION AREA	POPULATION AREA
Lee	42	782	522	
Linn	169	437	724	
Louisa				
Lucas				
Lyon				
Madison				
Mahaska				
Marion				
Marshall				
Mills	13	842	439	
Mitchell				
Monona				
Monroe				
Montgomery				
Muscatine				
O'Brien				
Osceola				
Page				
Palo Alto				
Plymouth				
Pocahontas				
Polk	313	620	582	
Pottawattamie				
Poweshiek				
Ringgold				
Sac				
Scott	161	427	459	
Shelby				
Sioux				
Story				

*Less than .5 psi overpressure

STATE OF IOWA (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA
Tama	18 964 722*
Taylor	8 297 537*
Union	13 855 426*
Van Buren	8 281 484
Wapello	39 386 434*
Warren	35 956 573	20 041 570*
Washington	7 837 527*
Wayne	43 236 718*
Webster	12 850 401*
Winnebago
Winneshiek	22 264 690*
Woodbury	101 027 873
Worth	8 906 401*
Wright	15 861 578*
TOTAL STATE	960 992 5 919	----	88 306 953	1 857 641 49 092 (312 608 7 716) (1 545 033 41 376(*

*Less than .5 psi overpressure

S T A T E O F K A N S A S - - D I R E C T E F F E C T S R I S K S U M M A R Y

Estimated 1985 Population: 2,454,933
 Land Area: 81,792 square miles

COUNTY	POPULATION AREA	VERY HIGH RISK			HIGH RISK			MEDIUM RISK			LOW/NO* RISK		
		GT 10 PSI	EQ/GT 5PSI	LT 10PSI	EQ/GT 5PSI	LT 2PSI	EQ/GT 2PSI	LT 5PSI	EQ/GT .5PSI	LT 2PSI	POPULATION AREA	POPULATION AREA	POPULATION AREA
Allen					16	160	505				8	867	583*
Anderson											17	964	431
Atchison											7	351	136*
Barber											33	523	895*
Barton													
Bourbon											15	817	638*
Brown	11	663	571								3	324	777*
Butler	47	629	1 443								4	937	644*
Chase													
Chautauqua													
Cherokee											22	307	590
Cheyenne											3	687	1 021*
Clark											2	726	976*
Clay											9	546	632
Cloud											12	024	718*
Coffey											10	139	615*
Comanche											2	592	790*
Cowley	37	379	1 128										
Crawford											38	049	595
Decatur											4	658	894*
Dickinson											19	972	852
Doniphan													
Douglas											70	265	461
Edwards											4	107	620*
Elk											3	635	650*

*Less than .5 psi overpressure

STATE OF KANSAS (continued)

COUNTY	VERY HIGH RISK AREA POPULATION	HIGH RISK AREA POPULATION	MEDIUM RISK AREA POPULATION	LOW/NO* RISK AREA	
				POPULATION	AREA
Ellis	29 004	900*
Ellsworth	6 362	717
Firney	30 041	1 302*
Ford	26 636	1 099*
Franklin	22 337	577
Geary	29 329	377	3 688	1 072*
Gove	4 256	898*
Graham	6 782	575*
Grant	5 373	868*
Gray	1 917	778
Greeley	8 732	1 135*
Greenwood	2 499	998
Hamilton	7 767	802*
Harper	31 144	541
Harvey
Haskell	3 876	578*
Hodgeman	2 265	860*
Jackson	11 502	658
Jefferson	16 072	536
Jewell	4 396	916
Johnson	302 948	478
Kearny	3 901	868
Kingman	9 141	866*
Kiowa	4 011	723*
Labette	25 690	653
Lane	2 560	717*
Leavenworth	58 999	463	3 771	720*
Lincoln	8 342	601
Linn	3 458	1 073
Logan

*Less than .5 psi overpressure

STATE OF KANSAS (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA
Lyon	27 785	900	•••••	38 382 844*
McPherson	•••••	•••••	•••••	13 316 944*
Marion	•••••	•••••	•••••	13 157 878*
Marshall	•••••	•••••	•••••	4 652 979*
Meade	•••••	•••••	•••••	•••••
Miami	•••••	•••••	•••••	22 370 590
Mitchell	42 372	646	•••••	7 879 717*
Montgomery	•••••	•••••	•••••	•••••
Morris	•••••	•••••	•••••	6 294 693
Morton	•••••	•••••	•••••	3 551 731*
Nemaha	•••••	•••••	•••••	11 148 719
Neosho	19 665	576	•••••	4 719 1 075*
Ness	•••••	•••••	•••••	6 530 873
Norton	•••••	•••••	•••••	•••••
Osage	•••••	•••••	16 345 695	•••••
Osborne	•••••	•••••	•••••	5 677 882*
Ottawa	•••••	•••••	•••••	5 823 721
Pawnee	•••••	•••••	•••••	8 369 755*
Phillips	7 276	887	•••••	•••••
Pottawatomie	15 954	828	•••••	•••••
Pratt	•••••	•••••	•••••	11 255 735*
Rawlins	•••••	•••••	•••••	3 990 1 069*
Reno	64 889	1 259	•••••	•••••
Republic	•••••	•••••	•••••	7 034 719*
Rice	•••••	•••••	•••••	11 669 728
Riley	63 181	593	•••••	•••••
Rooks	•••••	•••••	•••••	6 958 888
Rush	•••••	•••••	•••••	4 427 718*
Russell	•••••	•••••	•••••	9 344 869*
Saline	50 557	721	•••••	•••••

*Less than .5 psi overpressure

STATE OF KANSAS (Continued)

COUNTY	POPULATION	VERY HIGH RISK AREA		HIGH RISK AREA		MEDIUM RISK AREA		LOW/NO* RISK AREA	
		POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Scott	385	98	1 007					5 905	717*
Sedgwick	18	408	640						
Seward	160	006	549						
Shawnee									
Sheridan								3 435	896*
Sherman								7 425	1 057*
Smith								5 576	897*
Stafford								5 886	788*
Stanton								2 451	681*
Stevens								4 863	727
Sumner				25 457	1 184				
Thomas								9 160	1 075
Trego								4 428	890
Wabaunsee			6 775	797					
Wallace								2 075	914
Washington									
Wichita	2 684	719						7 890	898*
Wilson									
Woodson									
Wyandotte	172	339	149						
TOTAL STATE	1 241	903	14 109	311	640	2 946	74 253	3 488	827 137 61 249
									(363 362 17 582)
									(463 775 43 667)*

*Less than .5 psi overpressure

STATE OF MISSOURI -- DIRECT EFFECTS RISK

Estimated 1985 Population: 4,968,558
 Land Area: 68,576 square miles

COUNTY	POPULATION AREA	HIGH RISK		MEDIUM RISK		LOW/NO* RISK	
		GT 10 PSI	EQ/GT 5PSI LT 10PSI	EQ/GT 2PSI LT 5PSI	POPULATION AREA	POPULATION AREA	POPULATION AREA
Adair						25 447	567*
Andrew				15 285	436	8 640	542*
Atchison						25 774	697*
Audrain						26 082	773*
Barry						11 620	597
Barton							
Bates	15 991	849					
Benton	12 507	729					
Bollinger						10 414	621*
Boone				107 479	687		
Buchanan	86 001	409					
Butler						38 514	698*
Caldwell	33 202	542				8 099	431*
Callaway						23 226	641
Camden							
Cape Girardeau						60 804	577*
Carroll						11 543	695
Carter	55 154	702				5 705	509*
Cass	12 412	471					
Cedar							
Chariton						10 258	758*
Christian						24 655	564
Clark						8 254	507
Clay	138 910	403					
Clinton						16 139	423

*Less than .5 psi overpressure

STATE OF MISSOURI (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA
Cole	61 687	392		
Cooper	14 592	566		
Crawford	19 043	744
Dade	7 533	491
Dallas	12 760	543*
Daviess	8 648	568*
DeKalb	8 127	425
Dent	14 934	755*
Douglas	12 608	814*
Dunklin	35 924	547	
Franklin	74 755	922		
Gasconade	13 677	521*
Gentry	7 919	493*
Greene	194 885	678*
Grundy	11 542	437*
Harrison	9 919	725*
Henry	19 582	729		
Hickory	7 044	379
Holt	9 972	464
Howard	6 649	456
Howell		
Iron	30 461	927*
Jackson	634 530	611	11 542	552*
Jasper		
Jefferson	89 889	641*
Johnson	38 244	834		
Knox	5 277	507*
Laclede	26 106	768
LaFayette	30 315	632		
Lawrence	30 322	614*

*Less than .5 psi overpressure

STATE OF MISSOURI (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA
Lewis	11 165 508*
Lincoln	24 138 627
Linn	15 542 620*
Livingston	15 532 537*
McDonald	15 830 541*
	
Macon	17 010 797*
Madison	11 008 497*
Maries	7 896 528*
Marion	29 304 438*
Mercer	4 597 454*
	
Miller	20 308 593	15 770 410*
Mississippi	
Moniteau	12 906 417	
Monroe	9 699 670*
Montgomery	11 566 540*
	
Morgan	15 540 594	22 345 658
New Madrid	43 026 627*
Newton	22 573 875*
Nodaway	10 036 792*
Oregon	
	
Osage	12 200 606
Ozark	8 858 731*
Pemiscot	24 155 517	
Perry	17 125 473*
Pettis	35 726 686	
	
Phelps	35 514 674
Pike	16 953 673*
Platte	49 863 421	
Polk	20 220 636
Pulaski	44 051 550	

*Less than .5 psi overpressure

STATE OF MISSOURI (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA
Putnam	5 858	520*
Balls	9 076	481*
Randolph	26 165	477*
Ray	21 878 568	7 162	808*
Reynolds	12 767	632*
Ripley
St Charles	166 248 558
St Clair	8 667 698
Ste Genevieve	15 238	504*
St Francois	43 670	451*
St Louis	990 381 505
Saline	25 067 755	4 721	308*
Schuylerville	5 278	439*
Scotland	40 428	423*
Scott
Shannon	8 095	1 004*
Shelby	7 652	501*
Stoddard	28 536	818*
Stone	17 337	451*
Sullivan	7 134	651*
Taney	24 151	608*
Texas	21 640	1 108
Vernon	19 850	837
Warren	16 799	429*
Washington	18 661	762*

*Less than .5 psi overpressure

STATE OF MISSOURI (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA		HIGH RISK POPULATION AREA		MEDIUM RISK POPULATION AREA		LOW/NO* RISK POPULATION AREA	
Wayne	11	804
Webster	21	915
Worth	2	968
Wright	16	431
St Louis (City)	423	409	61					682*
TOTAL STATE	3 023	895	14 553	56 232	1 140	340 393	3 831	1 548 038 49 052 (298 582 10 821) (1 299 456 38 231)*

*Less than .5 psi overpressure

STATE OF NEBRASKA -- DIRECT EFFECTS RISK

Estimated 1985 Population: 1,614,811
Land Area: 76,639 square miles

COUNTY	POPULATION AREA	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		EQ/GT 2PSI LT 5PSI AREA	POPULATION AREA	EQ/GT • 5PSI LT 2PSI AREA	POPULATION AREA	LOW/NO* RISK
		GT 10 PSI	EQ/GT 5PSI LT 10PSI	EQ/GT 5PSI LT 10PSI	EQ/GT 2PSI LT 5PSI	EQ/GT • 5PSI LT 2PSI						
Adams		31	141	564	
Antelope		8	726	859*	
Arthur		475	475	710*	
Banner	1 084	747	775	775	714*	
Blaine		7	343	687*	
Boone		14	324	1 077*	
Box Butte		3	325	532*	
Boyd		4	287	1 214*	
Brown		38	764	946*	
Buffalo		8	741	486*	
Burt		9	138	584	
Butler		21	808	557	
Cass		11	255	740*	
Cedar		4	924	893*	
Chase		6	867	5 961*	
Cherry		10	046	1 196	
Cheyenne		7	815	574	
Clay		9	545	410*	
Colfax		11	447	575*	
Cuming		13	677	2 571*	
Custer		
Dakota	17 369	258	9	362	1 397*	
Dawes		22	298	982*	
Dawson		2	358	437	
Deuel		

*Less than .5 psi overpressure

STATE OF NEBRASKA (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA
Dixon				6 864 474*
Dodge				35 764 534*
Douglas		413 626 333		
Dundy				2 894 920*
Fillmore				7 732 576*
Franklin				4 293 576*
Frontier				3 632 976*
Furnas				6 536 721*
Gage				23 940 858*
Garden	2 725 1 680			
Garfield				2 422 570*
Gosper				2 160 461*
Grant				878 775*
Greeley				3 320 570*
Hall	50 376 537			
Hamilton			9 232 542	
Harlan				4 288 555*
Hayes				1 316 714*
Hitchcock				3 965 709*
Holt				14 004 2 406*
Hooker				1 024 720*
Howard				6 707 564
Jefferson				9 535 575*
Johnson				5 057 376*
Kearney				6 690 519*
Keith				9 138 1 039*
Keya Paha				1 237 769*
Kimball	4 967 952			
Knox				11 198 1 105*
Lancaster	205 512 839			

*Less than .5 psi overpressure

STATE OF NEBRASKA (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA
				POPULATION
Lincoln				34 217 2 525*
Logan				969 571*
Loup				897 574*
McPherson				561 859*
Madison				32 468 575*
Merrick	6 029	1 405	8 628 478	
Morrill				4 594 439*
Nance				8 330 408*
Nemaha				6 792 576*
Nuckolls				
Otoe				15 120 615*
Pawnee				3 695 432*
Perkins				3 813 885*
Phelps				10 198 540*
Pierce				8 514 575*
Platte				29 752 669*
Polk				5 973 437*
Red Willow				12 999 718*
Richardson				10 905 553
Rock				2 456 1 003*
Saline				13 066 576
Sarpy	95 470	238		
Saunders				18 574 753*
Scotts Bluff	38 419	725		
Seward			15 820 575	
Sheridan				7 807 2 453*
Sherman				3 972 564*
Sioux	1 738	2 069		
Stanton				6 437 431*
Thayer				7 463 575*

*Less than .5 psi overpressure

STATE OF NEBRASKA (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW/NO* RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Thomas	7 194	391	965	714*
Thurston	5 871	567*
Valley	15 464	386*
Washington	9 801	443*
Wayne
Webster	4 787	575*
Wheeler	1 101	575*
York	15 046	576*
TOTAL STATE	420 964	7 770	11 353	2 158	448 230	2 078	734 264	64 633 (79 485 5 168) (654 779 59 465)*

*Less than .5 psi overpressure

F E M A R E G I O N V I I I - - D I R E C T E F F E C T S R I S K S U M M A R Y

STATE	Estimated 1985 Population:			Land Area:			Population Area			EQ/GT 2PSI LT 5PSI AREA			EQ/GT 2PSI LT 5PSI AREA			LOW/NO* RISK AREA		
	Very High Risk			High Risk			Medium Risk			EQ/GT 5PSI LT 10PSI AREA			EQ/GT 2PSI LT 5PSI AREA			EQ/GT .5PSI LT 2PSI AREA		
	POPULATION	AREA	POPULATION	POPULATION	AREA	POPULATION	POPULATION	AREA	POPULATION	POPULATION	POPULATION	POPULATION	POPULATION	POPULATION	POPULATION	POPULATION	POPULATION	POPULATION
Colorado	2 129 554	21 244	420 758	768	11 157	559	688	649	81 081	(174 065	19 414)	(514 044	61 677)*			
Montana	419 999	47 939	---	---	30 641	13 978	382	232	83 448	(83 619	20 524)	(298 613	69 924)*			
North Dakota	481 812	33 890	11 496	3 744	4 752	1 036	199	516	30 674	(65 257	5 394)	(134 259	25 280)*			
South Dakota	290 207	20 782	2 493	1 969	---	---	416	028	53 205	(47 051	10 623)	(368 977	42 582)*			
Utah	1 137 432	17 388	28 848	4 479	71 167	5 069	461	420	55 158	(282 697	9 366)	(178 723	45 792)*			
Wyoming	313 177	51 368	6 058	2 856	5 572	4 871	196	763	37 991	(30 328	4 286)	(166 435	33 705)*			
TOTAL REGION VIII	4 772 181	192 611	469 653	13 816	123 289	25 513	1 944	608	341 557	(683 017	69 607)	(1 261 591	271 950)*			

*Less than .5 psi overpressure

STATE OF COLORADO -- DIRECTS EFFECTS RISK

COUNTY	Estimated 1985 Population:			103,652 square miles			POPULATION AREA	EQ/GT 5PSI LT 10PSI AREA	POPULATION AREA	EQ/GT 2PSI LT 5PSI AREA	POPULATION AREA	EQ/GT .5PSI LT 2PSI AREA	POPULATION AREA	LOW/NO* RISK									
	HIGH RISK			MEDIUM RISK																			
	VERY HIGH RISK	GT 10 PSI	POPULATION AREA	EQ/GT 5PSI LT 10PSI AREA	POPULATION AREA	EQ/GT 2PSI LT 5PSI AREA																	
Adams	277	973	1 235	12 588	719*								
Alamosa	378	836	800	5 798	1 353*								
Arapahoe	5 133	2 554*								
Archuleta								
Baca	5 913	1 008*								
Bent	8 148	1 285*								
Boulder	213	665	742	3 564	1 227*								
Chaffee	3 282	790*								
Cheyenne	1 952	740*								
Clear Creek	24 615	1 141*								
Conejos								
Costilla								
Crowley								
Custer								
Delta								
Denver	507	548	111	1 792	1 064*								
Dolores	35 853	841*								
Douglas	17 085	1 690*								
Eagle	8 500	1 851								
Elbert								
El Paso	358	941	2 129	31 488	1 538								
Fremont	28 651	2 952								
Garfield	2 822	149								
Gilpin	9 077	1 854*								
Grand								

*Less than .5 psi overpressure

STATE OF COLORADO (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA
Gunnison				10 471 3 238*
Hinsdale				531 1 115*
Huerfano				7 187 1 583*
Jackson				1 732 1 615*
Jefferson	420 750	1 615		
Kiowa				1 947 1 758*
Kit Carson				7 960 2 160*
Lake				6 762 379*
La Plata				31 744 1 692
Larimer				169 855 2 604*
Las Animas				14 778 4 771*
Lincoln	19 921	1 819		4 547 2 586*
Logan	98 752	3 309		
Mesa				
Mineral				808 877*
Moffat	15 593	4 732		
Montezuma				20 001 2 083*
Montrose				26 409 2 240*
Morgan				23 440 1 276
Otero				22 191 1 247*
Ouray				2 241 542*
Park				7 201 2 192*
Phillips				4 653 688*
Pitkin				10 356 968*
Prowers				14 492 1 629*
Pueblo	124 546	2 377		
Rio Blanco				6 960 3 222*
Rio Grande				11 468 913*
Routt				13 951 2 267
Saguache				4 141 3 176*

*Less than .5 psi overpressure

STATE OF COLORADO (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW/NO* RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
San Juan	•••••	•••••	•••••	•••••	•••••	•••••	1 085	388
San Miguel	•••••	•••••	•••••	•••••	•••••	•••••	3 006	1 287
Sedgwick	•••••	•••••	•••••	•••••	•••••	•••••	3 187	540
Summit	•••••	•••••	•••••	•••••	•••••	•••••	11 192	607
Teller	•••••	•••••	•••••	•••••	11 157	559		
Washington	•••••	•••••	•••••	•••••	•••••	•••••	5 548	2 520
Weld	133 779	3 990						
Yuma	•••••	•••••	•••••	•••••	•••••	•••••	9 991	2 365
TOTAL STATE	2 129 554	21 244	420 758	768	11 157	559	688 649	81 081
							(174 605	19 414)
							(514 044	61 677)*

*Less than .5 psi overpressure

STATE OF MONTANA - - DIRECT EFFECTS RISK

Estimated 1985 Population: 832,872
 Land Area: 145,365 square miles

COUNTY	POPULATION AREA	POPULATION AREA	HIGH RISK			MEDIUM RISK			LOW/NO* RISK		
			GT 10 PSI	EQ/GT 5PSI LT 10PSI	POPULATION AREA	EQ/GT 2PSI LT 5PSI	POPULATION AREA	EQ/GT .5PSI LT 2PSI	POPULATION AREA	EQ/GT .5PSI LT 2PSI	POPULATION AREA
Beaverhead	8 849	5 529*
Big Horn	7 056	4 259	11 639	4 983
Blaine	3 459	1 188*
Broadwater
Carbon	8 734	2 056
Carter	1 751	3 342
Cascade	82 077	2 699	13 535	3 776*
Chouteau	6 186	3 988	2 758	1 427*
Custer
Daniels
Dawson	12 939	2 347*
Deer Lodge	10 873	740*
Fallon	3 767	1 623*
Fergus	12 880	4 340	54 349	5 112*
Flathead	48 749	2 510*
Gallatin	1 704	4 491*
Garfield	11 450	2 995
Glacier	1 114	1 172	2 841	1 729*
Golden Valley	18 678	2 897*
Granite
Hill
Jefferson
Judith Basin	2 716	1 871
Lake	20 728	1 493
Lewis and Clark	46 434	3 461

*Less than .5 psi overpressure

STATE OF MONTANA (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA
Liberty	2 597	1 427		
Lincoln		18 885 3 616*
McCone		2 703 2 626
Madison		5 933 3 590*
Meagher		2 247 2 392
Mineral		3 694 1 216*
Missoula	76 535	2 582		4 373 1 871*
Musselshell		13 373 2 665
Park		676 1 652
Petroleum		
Phillips	5 756 5 131	
Pondera	7 155	1 632		2 471 3 288*
Powder River		6 849 2 329
Powell		1 873 1 732*
Prairie		
Ravalli		25 404 2 384
Richland		14 890 2 081*
Roosevelt	11 848	2 357		
Rosebud		13 959 5 019*
Sanders		9 326 2 749*
Sheridan	6 072	1 681		
Silver Bow		34 471 719*
Stillwater	6 114 1 793	
Sweetgrass	3 321 1 856*
Teton	6 424	2 275		
Toole	5 784	1 931		1 019 975*
Treasure		
Valley	9 916	4 936		
Wheatland	2 291	1 419		1 496 888*
Wibaux		

*Less than .5 psi overpressure

STATE OF MONTANA (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW/NO* RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Yellowstone	121	398	2	624				
Yellowstone National	66	245						
TOTAL STATE	419	999	47	939	---	---	30	641
							641	13
							978	978
							382	232
							83	448
							(
							83	619
							20	524
							(
							298	613
							62	924)*

*Less than .5 psi overpressure

STATE OF NORTH DAKOTA -- DIRECT EFFECTS RISK

Estimated 1985 Population: 697,576
 Land Area: 69,344 square miles

COUNTY	POPULATION AREA	HIGH RISK			MEDIUM RISK			LOW/NO* RISK		
		GT 10 PSI	EQ/GT 5PSI	LT 10PSI	EQ/GT 2PSI	LT 5PSI	POPULATION AREA	EQ/GT .5PSI	LT 2PSI	POPULATION AREA
Adams	3 494	988
Barnes	13 666	1 498	8 099	1 412	1 332	1 152*
Benson
Billings
Bottineau	9 120	1 668	4 334	1 162*
Bowman
Burke	3 655	1 118	60 173	1 618	97 117	1 767	7 029	1 507
Burleigh
Cass
Cavalier
Dickey	6 876	1 139*
Divide	3 200	1 288	5 380	1 993*
Dunn
Eddy	3 230	634	5 692	1 499*
Emmons	4 564	640
Foster	2 688	1 003*
Golden Valley	4 147	1 660*
Grand Forks	69 331	1 440	3 777	1 362*
Grant	6 037	1 150*
Griggs	3 631	780	3 203	1 000*
Hettinger	3 954	1 133
Kidder
La Moure
Logan
McHenry	7 432	1 887

*Less than .5 psi overpressure

STATE OF NORTH DAKOTA (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA
McIntosh	4 406 984*
McKenzie	8 890 2 754	
McLean	13 042 2 065	16 279 1 044	
Mercer	
Morton	27 044 1 920	
Mounttrail	8 188 1 837	
Nelson	4 946 991	2 724 723	
Oliver	
Pembina	10 129 1 120	5 998 1 037*	
Pierce	
Ramsey	13 031 1 241	
Ransom	6 452 862*	
Renville	3 555 874	
Richland	20 230 1 436*	
Rolette	13 300 914*	
Sargent	5 186 858*	
Sheridan	2 606 990	
Sioux	3 753 1 099*	
Slope	1 148 1 219*	
Stark	28 911 1 338	
Steele	2 896 714	
Stutsman	23 547 2 263*	
Towner	4 752 1 036	
Trail	9 285 861	
Walsh	15 579 1 290	
Ward	65 495 2 041	
Wells	6 793 1 288*	
Williams	28 270 2 047	
TOTAL STATE	481 812 33 890	11 496 3 744	4 752 1 036	199 516 30 674 (65 257 5 394) (134 259 25 280)*

S T A T E O F S O U T H D A K O T A - - D I R E C T E F F E C T S R I S K

Estimated 1985 Population: 708,728
Land Area: 75,956 square miles

COUNTY	POPULATION AREA	HIGH RISK			MEDIUM RISK			LOW/NO* RISK		
		GT 10 PSI	EQ/GT 5PSI	LT 10PSI	EQ/GT 2PSI	LT 5PSI	EQ/GT • 5PSI	LT 2PSI	POPULATION AREA	POPULATION AREA
Aurora	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	3 435	707*
Beadle	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	18 136	1 259*
Bennett	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	3 313	1 181*
Bon Homme	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	7 814	552*
Brookings	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	25 165	795*
Brown	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	36 712	1 722*
Brule	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	5 408	815*
Buffalo	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	1 685	476*
Butte	8 125	2 251	•••••	•••••	•••••	•••••	•••••	•••••	2 274	732*
Campbell	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••
Charles Mix	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	9 719	1 090*
Clark	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	4 950	953*
Clay	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	13 647	408*
Codington	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	22 368	695*
Corson	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	5 243	2 467*
Custer	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	6 795	1 559
Davison	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	17 806	436*
Day	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	7 893	1 022*
Deuel	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	5 203	631*
Dewey	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	5 487	2 310*
Douglas	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	3 894	434*
Edmunds	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	4 933	1 149*
Fall River	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	7 820	1 740*
Faulk	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	3 312	1 003*
Grant	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	9 582	681*

*Less than .5 psi overpressure

STATE OF SOUTH DAKOTA (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA
Gregory	2 965	1 822	5 871 1 041*
Haakon	5 251 512*
Hamlin	4 701 1 437*
Hand	3 290 433*
Hanson
Harding	14 830	757	1 889 2 678
Hughes	9 045 816*
Hutchinson	1 909 860*
Hyde
Jackson	3 266	1 872	2 728 530*
Jerauld	1 500 971
Jones	6 493 824*
Kingsbury	11 002 560*
Lake
Lawrence	19 380	800
Lincoln	14 384	578	3 892 1 679
Lyman	6 234 576*
McCook	3 766 1 148*
McPherson	5 209 848*
Marshall
Meade	21 716	3 481
Mallette	2 365	1 311	3 482 570*
Miner
Minnehaha	120 296	810
Moody	6 964 520*
Pennington	75 780	2 783
Perkins	4 649	2 885	3 715 869*
Potter	11 063 1 102*
Roberts	3 093 569*
Sanborn

*Less than .5 psi overpressure

STATE OF SOUTH DAKOTA (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA		HIGH RISK POPULATION AREA		MEDIUM RISK POPULATION AREA		LOW/NO* RISK POPULATION AREA	
Shannon	11	207
Spink	9	081
Stanley	2	451	1	432	1	505*
Sully	1	868
Todd	7	256
Tripp	7	188
Turner	9	126
Union	10	774
Walworth	6	624
Yankton	19	123
Ziebach	2	493	1	969	518*	
TOTAL STATE	290	207	20	782	2	493	1	969
	----	----	----	----	----	----	416	028
							(53 205
							47	051
							(10 623)
							368	977
							42	582)*

*Less than .5 psi overpressure

STATE OF UTAH -- DIRECT EFFECTS RISK

Estimated 1985 Population: 1,698,867
 Land Area: 82,094 square miles

COUNTY	VERY HIGH RISK			HIGH RISK			MEDIUM RISK			LOW/NO* RISK		
	POPULATION AREA	GT 10 PSI	EQ/GT 5PSI LT 10PSI	POPULATION AREA	EQ/GT 5PSI LT 10PSI	POPULATION AREA	EQ/GT 2PSI LT 5PSI	POPULATION AREA	EQ/GT *5PSI LT 2PSI	POPULATION AREA	EQ/GT *5PSI LT 2PSI	POPULATION AREA
Beaver	5 280	2 586*
Box Elder	37 769	5 614	66 658	1 171	26 132	1 479*
Cache	16 271	3 234	856	699*
Carbon
Daggett
Davis	174 969	299
Duchesne	16 271	3 234
Emery	13 911	4 449*
Garfield	4 319	4 449*
Grand	7 957	3 689
Iron	20 357	3 302*
Juab	6 274	3 396*
Kane
Millard	13 762	6 818*
Morgan	5 285	603
Piute	1 476	759*
Rich	2 638	1 034*
Salt Lake	716 909	756
San Juan	12 096	7 725*
Sanpete	17 343	1 586*
Sevier	16 360	1 910*
Summit	13 230	1 865
Tooele	29 408	6 919	29 848	4 479
Uintah
Utah	246 181	2 018

*Less than .5 psi overpressure

STATE OF UTAH (Continued)

COUNTY	POPULATION	AREA	HIGH RISK POPULATION	AREA	MEDIUM RISK POPULATION	AREA	LOW/NO* RISK POPULATION	AREA
			VERY HIGH RISK POPULATION	HIGH RISK POPULATION	MEDIUM RISK POPULATION	LOW/NO* RISK POPULATION		
Wasatch	•••••	•••••	•••••	•••••	•••••	•••••	10 044	1 191
Washington	•••••	•••••	•••••	•••••	•••••	•••••	34 783	2 422*
Wayne	•••••	•••••	•••••	•••••	•••••	•••••	2 136	2 461*
Weber	162	106	566					
TOTAL STATE	1 137	432	17 388	28 848	4 479	71 167	5 069	(461 420 55 158 282 697 9 366) (178 723 45 792)*

*Less than .5 psi overpressure

STATE OF WYOMING -- DIRECT EFFECTS RISK

Estimated 1985 Population: 521,570
 Land Area: 97,086 square miles

COUNTY	POPULATION AREA	HIGH RISK		MEDIUM RISK		POPULATION AREA	EQ/GT 2PSI LT 5PSI	EQ/GT 5PSI LT 10PSI	POPULATION AREA	EQ/NO* RISK
		GT 10 PSI	EQ/GT 5PSI LT 10PSI	EQ/GT 2PSI LT 5PSI	POPULATION AREA					
Albany	12	559	3	139	30 328 4 286
Big Horn	20	407	7	878	37 605 4 796*
Campbell	15	207	4	271
Carbon
Converse
Crook	6	058	2	856
Fremont	12	430	2	186	36 886 9 181*
Goshen
Hot Springs	6 119 2 005*
Johnson	7 107 4 166*
Laramie	73	254	2	864
Lincoln	15	176	4	070
Natrona	75	746	5	247
Niobrara
Park	25	213	6	936	3 358 2 685*
Platte	9	369	2	023
Sheridan	27 466 2 532*
Sublette	45	791	10	352	5	572	4	871
Sweetwater	11 553 4 012*
Teton
Uinta	26 235 2 085*
Washakie	8	025	2	402	10 106 2 243*
Weston
TOTAL STATE	313 177	51	368	6	058	2	856	5	572	4 871

TOTAL STATE

313 177 51 368 * Less than .5 psi overpressure

196 763 37 991

(30 328 4 286)

(166 435 33 705)*

F E M A R E G I O N I X - - D I R E C T E F F E C T S R I S K S U M M A R Y

Estimated 1985 Population: 31,504,342
 Land Area: 386,970 square miles

STATE	POPULATION AREA	HIGH RISK			MEDIUM RISK			LOW RISK		
		GT 10 PSI	EQ/GT 5PSI	LT 10PSI AREA	POPULATION AREA	EQ/GT 2PSI	LT 5PSI AREA	POPULATION AREA	EQ/GT .5PSI	LT 2PSI AREA
Arizona	2 736 846 66 420	---	---	---	123 720	6 851	278 422	40 549	(53 418	11 211)
California	23 833 741 87 405	---	---	---	1 192 975	15 170	1 079 128	53 700	(728 659	19 776)
Hawaii	[DATA AVAILABLE SEPARATELY]	(350 469	33 924)*
Nevada	837 864 37 489	---	---	---	37 553	2 751	62 774	69 691	(3 408	3 851)*
American Samoa	[DATA AVAILABLE SEPARATELY]	(59 366	65 840)*
Guam	[DATA AVAILABLE SEPARATELY]
Trust Territory	[DATA AVAILABLE SEPARATELY]
TOTAL REGION IX	27 408 451 191 318	---	---	---	1 354 248	24 772	1 420 324	163 940	(785 485	34 838)*
									(634 839	129 102)*

*Less than .5 psi overpressure

STATE OF ARIZONA -- DIRECT EFFECTS RISK

Estimated 1985 Population: 3,138 988
 Land Area: 113,550 square miles

COUNTY	POPULATION AREA	VERY HIGH RISK			HIGH RISK			MEDIUM RISK			EQ/GT 5PSI LT POPULATION AREA	EQ/GT 2PSI LT POPULATION AREA	EQ/GT 5PSI LT POPULATION AREA	EQ/GT 2PSI LT POPULATION AREA	LOW/NO* RISK	
		GT 10 PSI	POPULATION AREA	EQ/GT 5PSI LT POPULATION AREA	EQ/GT 2PSI LT POPULATION AREA	EQ/GT 5PSI LT POPULATION AREA	EQ/GT 2PSI LT POPULATION AREA	EQ/GT 5PSI LT POPULATION AREA	EQ/GT 2PSI LT POPULATION AREA	EQ/GT 5PSI LT POPULATION AREA						
Apache	95	247	6	219	53	418	11	211	
Cochise	85	381	18	608	38	830	4	753*	
Coconino	23	316	4	631*	
Gila	
Graham	
Greenlee	1	766	60	9	127	9	640	1	837*	
Maricopa	71	818	13	285	
Mohave	
Navajo	610	597	9	187	72	022	9	995*	
Pima	
Pinal	102	303	5	343	
Santa Cruz	21	417	1	238	
Yavapai	107	743	9	994	81	196	8	122*	
Yuma	
TOTAL STATE	2	736	846	66	420	---	---	123	770	6	581	(278	422	40	549
)	53	418	11	211)
)	225	004	29	388)*

*Less than .5 psi overpressure

STATE OF CALIFORNIA -- DIRECT EFFECTS RISK

Estimated 1985 Population: 26,105,844
 Land Area: 156,279 square miles

COUNTY	POPULATION AREA	HIGH RISK			MEDIUM RISK			LOW/NO* RISK		
		GT 10 PSI	EQ/GT 5PSI	LT 10PSI	EQ/GT 2PSI	LT 5PSI	EQ/GT • 5PSI	LT 2PSI	POPULATION AREA	POPULATION AREA
Alameda	1 190 343	736							1 141	739*
Alpine	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	22 813	589
Amador	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	162 165	1 646
Butte	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	26 876	1 021
Calaveras	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	14 543	1 153*
Colusa	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	102 112	1 715
Contra Costa	708 382	730								
Del Norte	18 370	1 007								
El Dorado	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••		
Fresno	574 401	5 978								
Glenn	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	22 999	1 319*
Humboldt	104 881	4 173								
Imperial	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	18 372	10 223*
Inyo	477 128	8 130								
Kern	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••		
Kings	83 706	1 392								
Lake	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	47 940	1 262*
Lassen	24 433	4 553								
Los Angeles	8 006 962	4 070							76 585	2 145
Madera	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••		
Marin	224 538	523							13 230	1 456
Mariposa	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••		
Mendocino	72 881	3 512								
Merced	159 970	1 944								
Modoc	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	9 810	4 046*

*Less than .5 psi overpressure

STATE OF CALIFORNIA (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA
Mono	9 243 3 019*
Monterey	3 26 370	3 303	102 667 744	68 276 960
Napa
Nevada
Orange	2 111 396	798	137 111 1 416	18 745 2 573
Placer
Plumas
Riverside	805 521	7 214
Sacramento	887 649	971	30 158 1 388
San Benito
San Bernardino	1 068 239	20 064
San Diego	2 114 283	4 212
San Francisco	721 187	46
San Joaquin	411 407	1 415
San Luis Obispo	184 867	3 308
San Mateo	609 317	447
Santa Barbara	328 764	2 748
Santa Clara	1 390 579	1 293	210 206 446	129 180 3 786*
Santa Cruz
Shasta
Sierra	3 403 959
Siskiyou	42 324 6 281
Solano	273 235	834
Sonoma	332 912 1 604
Stanislaus	303 105	1 506
Sutter	58 181 602
Tehama	44 142 2 953*
Trinity	13 486 3 190*
Tulare	279 040 4 808	39 613 2 234*
Tuolumne

*Less than .5 psi overpressure

STATE OF CALIFORNIA (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	MEDIUM RISK POPULATION AREA	LOW/NO* RISK POPULATION AREA
Ventura	598 564	1 862	122 536 1 014
Yolo	53 263	640	
Yuba			
TOTAL STATE	23 833 741	87 409	----	1 192 975 15 170 (728 659 19 776) (350 469 33 924)*

*Less than .5 psi overpressure

STATE OF HAWAII - DIRECT EFFECTS RISK

Estimated 1985 Population: 1,057,270
 Land Area: 6,427 square miles

COUNTY	POPULATION AREA	HIGH RISK GT 10 PSI	HIGH RISK EQ/GT 5PSI LT 10PSI	MEDIUM RISK EQ/GT 2PSI LT 5PSI	LOW/NO* RISK		
					POPULATION AREA	POPULATION AREA	POPULATION AREA
Hawaii	[DATA AVAILABLE SEPARATELY]	[DATA AVAILABLE SEPARATELY]	[DATA AVAILABLE SEPARATELY]	[DATA AVAILABLE SEPARATELY]	109	953	4 034
Honolulu	[DATA AVAILABLE SEPARATELY]	[DATA AVAILABLE SEPARATELY]	[DATA AVAILABLE SEPARATELY]	[DATA AVAILABLE SEPARATELY]	815	900	597
Kalawao	[DATA AVAILABLE SEPARATELY]	[DATA AVAILABLE SEPARATELY]	[DATA AVAILABLE SEPARATELY]	[DATA AVAILABLE SEPARATELY]	144	144	14
Kauai	[DATA AVAILABLE SEPARATELY]	[DATA AVAILABLE SEPARATELY]	[DATA AVAILABLE SEPARATELY]	[DATA AVAILABLE SEPARATELY]	45	191	620
Maui	[DATA AVAILABLE SEPARATELY]	[DATA AVAILABLE SEPARATELY]	[DATA AVAILABLE SEPARATELY]	[DATA AVAILABLE SEPARATELY]	86	082	1 162
TOTAL STATE	---	---	---	---	1 057	270	6 427

*Less than .5 psi overpressure

S T A T E O F N E V A D A - - D I R E C T E F F E C T S R I S K

Estimated 1985 Population: 938,191
 Land Area: 109,895 square miles

COUNTY	POPULATION AREA	EQ/GT 10 PSI	HIGH RISK EQ/GT 5PSI LT 10PSI	MEDIUM RISK EQ/GT 2PSI LT 5PSI	LOW/NO* RISK EQ/GT • 5PSI LT 2PSI	
					POPULATION AREA	POPULATION AREA
Churchill	14 479	4 990				
Clark	554 764	7 881				
Douglas			21 345	708		
Elko					21 012	17 135*
Esmeralda					1 531	3 587
Eureka						
Humboldt					1 342	4 175*
Lander					11 285	9 698*
Lincoln					4 455	5 515*
Lyon				16 208	2 007	3 493
Mineral						10 635*
Nye	15 772	18 155				5 961
Pershing						3 744*
Storey					3 587	6 036*
Washoe	215 966	6 317			1 877	264
White Pine						
Carson City (Ind)	36 883	146				
TOTAL STATE	837 864	37 489	---	---	37 553	2 715
						(3 408 3 851)
						(59 366 65 840)*

*Less than .5 psi overpressure

T E R R I T O R Y O F A M E R I C A N S A M O A - - D I R E C T E F F E C T S R I S K

		Estimated 1980 Population: 35,000			
		Land Area: 77 square miles			
COUNTY	POPULATION AREA	VERY HIGH RISK	HIGH RISK	MEDIUM RISK	LOW/NO* RISK
		GT 10 PSI	EQ/GT 5PSI LT 10PSI	EQ/GT 2PSI LT 5PSI	EQ/GT • 5PSI LT 2PSI
		POPULATION AREA	POPULATION AREA	POPULATION AREA	POPULATION AREA
Entire Territory			[DATA AVAILABLE SEPARATELY]	35 000 77
TOTAL TERRITORY	---	---	---	---	35 000 77

*Less than .5 psi overpressure

T E R R I T O R Y O F G U A M - D I R E C T E F F E C T S R I S K

Estimated 1985 Population: 112,900
Land Area: 209 square miles

COUNTRY POPULATION AREA	HIGH RISK GT 10 PSI POPULATION AREA	MEDIUM RISK EQ/GT 5PSI LT 10PSI POPULATION AREA	LOW/NO* RISK EQ/GT • 5PSI LT 2PSI POPULATION AREA		
			EQ/GT 2PSI LT 5PSI POPULATION AREA	EQ/GT 2PSI LT 5PSI POPULATION AREA	EQ/GT • 5PSI LT 2PSI POPULATION AREA
Entire Territory	[DATA AVAILABLE SEPARATELY]	112 900 209
TOTAL TERRITORY	---	---	---	---	112 900 209

*Less than .5 psi overpressure

U . S . T R U S T T E R R I T O R Y -- D I R E C T E F F E C T S R I S K

Estimated 1980 Population: 116,149
 Land Area: 533 square miles

COUNTY	POPULATION AREA	VERY HIGH RISK	HIGH RISK	MEDIUM RISK	LOW/NO* RISK
		GT 10 PSI	EQ/GT 5PSI LT 10PSI	EQ/GT 2PSI LT 5PSI	EQ/GT • 5PSI LT 2PSI
Entire Territory	[DATA AVAILABLE SEPARATELY]	116 149 533
TOTAL TERRITORY	---	---	---	---	116 149 533

*Less than .5 psi overpressure

F E M A R E G I O N X - - D I R E C T E F F E C T S R I S K S U M M A R Y

Estimated 1985 Population: 8,634,750
 Land Area: 815,946 square miles

STATE	POPULATION AREA	HIGH RISK		MEDIUM RISK		LOW/NO* RISK	
		EQ/GT 10 PSI	EQ/GT 5PSI LT 10 PSI	EQ/GT 2PSI LT 5PSI	EQ/GT 2PSI LT 5PSI	EQ/GT •5PSI LT 2PSI	POPULATION AREA
Alaska							
Idaho	363 270 8 838	22 102	468	105 730	3 336	(144 356	69 277
Oregon	1 043 460 14 949	45 358	741	532 016	4 639	(277 287	11 652)
Washington	3 838 312 38 943	---	---	63 737	2 330	(231 863	57 625)*
TOTAL REGION X	5 245 042 62 730	67 460	1 209	701 483	10 305	(208 360	170 374

(653 506
 (1 432 988 35 725)
 134 649)*

*Less than .5 psi overpressure

STATE OF ALASKA - - DIRECT EFFECTS RISK

Estimated 1985 Population: 534,271
 Land Area: 570,833 square miles

COUNTY	POPULATION AREA	HIGH RISK			MEDIUM RISK			LOW RISK		
		GT 10 PSI	EQ/GT 5PSI LT 10PSI	POPULATION AREA	EQ/GT 2PSI LT 5PSI	POPULATION AREA	EQ/GT 5PSI LT 2PSI	POPULATION AREA	EQ/GT	LT
Aleutian Islands	7	066	10	890
Anchorage	239	699	1	732
Bethel	[DATA]	12	358	36	104
Bristol Bay	1	142	531	531
Dillingham	4	988	46	042
Fairbanks North	64	320	7	404
Haines	1	997	2	374
Juneau	24	835	2	626
Kenai Peninsula	43	080	16	056
Ketchikan Gateway	13	381	1	242
Kobuk	5	768	31	593
Kodiak Island	17	229	4	796
Matanuska-Susitna	SEPARATELY]	32	533	24	502
Nome	7	758	23	871
North Slope	5	303	90	955
Prince of Wales	5	077	7	660
Sitka	7	344	2	938
Skagway-Yakutat	4	068	13	239
SE Fairbanks	6	428	24	169
Valdez-Cordova	8	583	39	229
Wade Hampton	5	725	17	816
Wrangell-Petersburg	6	396	5	965
Yukon-Koyukuk	9	193	159	099
TOTAL STATE	---	---	---	---	---	---	534	271	570	833

S T A T E O F I D A H O - - D I R E C T E F F E C T S R I S K

Estimated 1985 Population: 1,014,281
 Land Area: 82,414 square miles

COUNTY	POPULATION AREA	EQ/GT 10 PSI AREA	HIGH RISK	MEDIUM RISK	LOW/NO* RISK	
					EQ/GT 5PSI LT POPULATION AREA	EQ/GT .5PSI LT POPULATION AREA
Ada	193 281 1 052	3 432	1 362*
Adams	69 355 1 112	7 181	990
Bannock	8 678	784
Bear Lake
Benewah
Bingham	38 633 2 096	13 418	2 635*
Blaine	2 907	1 901
Boise	26 862	1 727*
Bonner	69 727 1 840
Bonneville	7 620	1 268*
Boundary	3 359	2 236*
Butte	88 722	584
Camas	10 291	2 236*
Canyon	8 673 1 763	6 866	4 927*
Caribou	21 278	2 560*
Cassia	10 779	1 763*
Clark	11 460	558
Clearwater	12 580	728*
Custer	14 527	8 497*
Elmore	22 234 3 071	9 856	664*
Franklin	10 996	1 852*
Fremont	11 460	558
Gem	12 580	728*
Gooding	14 527	8 497*
Idaho

*Less than .5 psi overpressure

STATE OF IDAHO (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA	HIGH RISK POPULATION AREA	POPULATION AREA	MEDIUM RISK		LOW/NO* RISK POPULATION AREA
				POPULATION AREA	AREA	
Jefferson	•••••	•••••	•••••	•••••	•••••	16 569 1 093
Jerome	•••••	•••••	•••••	•••••	•••••	16 212 601*
Kootenai	•••••	•••••	•••••	67 097 1 240	•••••	30 625 1 077*
Latah	•••••	•••••	•••••	•••••	•••••	7 891 4 564*
Lehki	•••••	•••••	•••••	•••••	•••••	3 922 478*
Lewis	•••••	•••••	•••••	•••••	•••••	3 756 1 205*
Lincoln	•••••	•••••	•••••	•••••	•••••	22 102 468*
Madison	•••••	•••••	•••••	•••••	•••••	21 531 758*
Minidoka	•••••	•••••	•••••	•••••	•••••	33 254 845*
Nez Perce	•••••	•••••	•••••	•••••	•••••	3 539 1 200*
Oneida	•••••	•••••	•••••	•••••	•••••	8 839 7 643
Owyhee	•••••	•••••	•••••	•••••	•••••	15 937 405*
Payette	•••••	•••••	•••••	6 852 1 403	•••••	16 897 2 641*
Power	•••••	•••••	•••••	•••••	•••••	3 302 448*
Shoshone	•••••	•••••	•••••	•••••	•••••	56 904 1 944*
Teton	•••••	•••••	•••••	•••••	•••••	7 000 3 670*
Twin Falls	•••••	•••••	•••••	•••••	•••••	8 572 1 454*
Valley	•••••	•••••	•••••	•••••	•••••	
Washington	•••••	•••••	•••••	•••••	•••••	
TOTAL STATE	363 270 8 838	22 102	468	105 730 3 336		523 179 69 277
						{ 144 356 11 652)
						(378 823 57 625)*

*Less than .5 psi overpressure

STATE OF OREGON -- DIRECT EFFECTS RISK

Estimated 1985 Population: 2,683,926
Land Area: 96,187 square miles

COUNTY	POPULATION AREA	HIGH RISK			MEDIUM RISK			LOW/NO* RISK		
		GT 10 PSI	EQ/GT 5PSI	LT 10PSI	EQ/GT 2PSI	LT 5PSI	EQ/GT .5PSI	LT 2PSI	POPULATION AREA	POPULATION AREA
Baker									16 399	3 072*
Benton									65 950	679*
Clackamas										
Clatsop	32 360	805								
Columbia	37 060	651								
Coos	60 458	1 606								
Crook										
Curry										
Deschutes										
Douglas										
Gilliam									13 003	2 984*
Grant									16 878	1 629
Harney									65 782	3 025*
Hood River									91 809	5 044
Jackson										
Jefferson										
Josephine										
Klamath	58 300	5 954								
Lake										
Lane										
Lincoln										
Linn										
Malheur										
Marion	211 140	1 184								
Morrow										

*Less than .5 psi overpressure

STATE OF OREGON (Continued)

COUNTY	VERY HIGH RISK POPULATION	HIGH RISK AREA	POPULATION	AREA	MEDIUM RISK POPULATION	AREA	LOW/NO* RISK POPULATION	AREA
Multnomah	561	570	431					
Polk	45	358	741	2	294
Sherman	21	679	1	101				827*
Tillamook	60	893	3	217				
Umatilla								
Union							24	745
Wallowa							7	595
Wasco							22	521
Washington			268	875	725		2	385*
Wheeler							1	489
Yamhill							1	713*
							58	290
								715
TOTAL STATE	1 043	460	14 949	45 358	741	532 016	4 639	1 063 092
							(277 287	75 858 10 664)
							(785 885	65 194)*

*Less than .5 psi overpressure

STATE OF WASHINGTON -- DIRECT EFFECTS RISK

Estimated 1985 Population: 4,402,272
 Land Area: 66,512 square miles

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW/NO* RISK	
	POPULATION	AREA	EQ/GT 5PSI	LT 10PSI	EQ/GT 2PSI	LT 5PSI	EQ/GT .5PSI	LT 2PSI
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Adams	13 664	1 922
Asotin	113	359	1 715	17 309	635*
Benton
Chelan	49 587	2 915*
Clallam	52	381	1 753
Clark	207	459	627	4 031	864*
Columbia	79	164	1 139	24 068	1 817*
Cowlitz	6 023	2 200*
Douglas
Ferry
Franklin	36 914	1 243
Garfield	52	678	2 660	2 567	706*
Grant
Grays Harbor	48	374	212	64 224	1 918
Island
Jefferson	17	748	1 805	25 016	2 308
King	1 337	360	2 128	16 603	1 880*
Kitsap	169	172	393
Kittitas
Klickitat
Lewis	57 735	2 409*
Lincoln	9 627	2 310
Mason	35 586	961
Okanogan	33 037	5 281*
Pacific	17 922	908

*Less than .5 psi overpressure

STATE OF WASHINGTON (Continued)

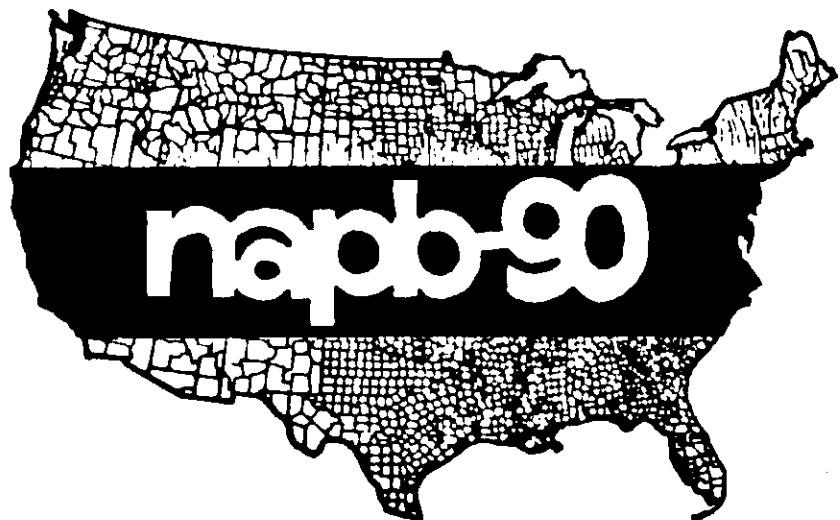
COUNTY	VERY HIGH RISK POPULATION AREA		HIGH RISK POPULATION AREA		MEDIUM RISK POPULATION AREA		LOW/NO* RISK POPULATION AREA	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Pend Oreille	523	288	1	675	8	902
Pierce	70	097	1	735	8	901	179
San Juan	7	467
Skagit	7	672*
Skamania
Snohomish	375	615	2	098	31	565
Spokane	355	552	1	764	3	681
Stevens	141	832	727	48	500
Thurston	41	031
Wahkiakum	2	151*
Walla Walla	113	087	2	125
Whatcom	181	146	4	287
Whitman
Yakima
TOTAL STATE	3	838	312	38	943	---	63	737
						2	330	500
								223
								25
								239
							(231
								863
								13
								409)
							(208
								360
								23
								930)*

*Less than .5 psi overpressure

Nuclear Attack Planning Base-1990 Final Project Report

Annex B Fallout Risk Statistics & Maps

[https://ia801602.us.archive.org/14/
items/1990FEMADirectEffectsFireRiskStatisticsMapsNAPB90annexa216p/1990%20FEMA%20Direct%20effects%20%26%20Fire%20risk%20statistics%20%26%20maps%20NAPB90-annexa%20%20216p.pdf](https://ia801602.us.archive.org/14/items/1990FEMADirectEffectsFireRiskStatisticsMapsNAPB90annexa216p/1990%20FEMA%20Direct%20effects%20%26%20Fire%20risk%20statistics%20%26%20maps%20NAPB90-annexa%20%20216p.pdf) (retrieved 27 June 2018)



A N N E X B - F A L L O U T R I S K

This Annex provides summaries of the fallout risk to U.S. resident population and land area by State counties. For a discussion of the methodology employed to obtain this data, see Part 3., "Risk Definitions."

A N N E X B - F A L L O U T R I S K

T A B L E O F C O N T E N T S

	<u>Page</u>
NATIONAL Fallout Risk Map	B- 5*
NATIONAL Fallout Risk Summary	B- 7*
REGION I Fallout Risk Summary	B- 9
Connecticut	B- 11
Maine	B- 13
Massachusetts	B- 15
New Hampshire	B- 17
Rhode Island	B- 19
Vermont	B- 21
REGION II Fallout Risk Summary	B- 23
New Jersey	B- 25
New York	B- 27
Puerto Rico	B- 31
Virgin Islands	B- 33
REGION III Fallout Risk Summary	B- 35
Delaware	B- 37
District of Columbia	B- 39
Maryland	B- 41
Pennsylvania	B- 43
Virginia	B- 47
West Virginia	B- 53
REGION IV Fallout Risk Summary	B- 57*
Alabama	B- 59
Florida	B- 63
Georgia	B- 67
Kentucky	B- 75
Mississippi	B- 81*
North Carolina	B- 85
South Carolina	B- 91
Tennessee	B- 95
REGION V Fallout Risk Summary	B- 101
Illinois	B- 103
Indiana	B- 109
Michigan	B- 115
Minnesota	B- 119
Ohio	B- 125
Wisconsin	B- 131

*Interim data; to be corrected

ANNEX B - TABLE OF CONTENTS (Continued)

	<u>Page</u>
REGION VI Fallout Risk Summary	B-135*
Arkansas	B-137*
Louisiana	B-141*
New Mexico	B-145
Oklahoma	B-149*
Texas	B-153*
REGION VII Fallout Risk Summary	B-163*
Iowa	B-165
Kansas	B-171*
Missouri	B-177
Nebraska	B-183
REGION VIII Fallout Risk Summary	B-189
Colorado	B-191
Montana	B-195
North Dakota	B-199
South Dakota	B-203
Utah	B-207
Wyoming	B-211
REGION IX Fallout Risk Summary	B-213
Arizona	B-215
California	B-217
Hawaii	B-221
Nevada	B-223
American Samoa	B-225
Guam	B-227
Trust Territory	B-229
REGION X Fallout Risk Summary	B-231
Alaska	B-233
Idaho	B-235
Oregon	B-239
Washington	B-243

*Interim data; to be corrected

[A NATIONAL FALLOUT RISK MAP WILL BE PUBLISHED SEPARATELY]

NATIONAL FALLOUT RISK SUMMARY

Estimated 1985 Population: 242,109,419
 Land Area: 3,551,226 square miles

FEMA REGION	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Region I	---	---	---	---	1 900 820	13 044	10 419 387	48 638
Region II	---	---	---	---	1 091 500	10 398	27 534 618	48 038
Region III	---	---	---	---	489 309	2 487	24 609 567	118 063
Region IV*	58 176	995	10 023 786	72 614	8 873 497	85 897	23 487 246	219 540
Region V	1 302 116	40 280	8 947 930	119 939	28 512 850	135 959	6 924 191	27 367
Region VI*	313 222	8 955	4 879 207	98 751	6 518 856	103 069	16 429 077	337 808
Region VII*	4 876 949	140 887	6 980 657	131 586	87 635	10 498	---	---
Region VIII	1 620 896	209 611	3 159 198	140 926	2 080 308	112 806	849 329	110 154
Region IX	1 351 111	20 941	14 558 057	52 204	9 492 568	72 277	6 102 606	241 548
Region X	---	---	640 633	8 387	3 571 884	72 376	4 442 233	735 183
NATIONAL TOTALS*	9 522 470	421 669	49 189 468	624 407	62 619 227	618 811	120 778 254	1 886 339

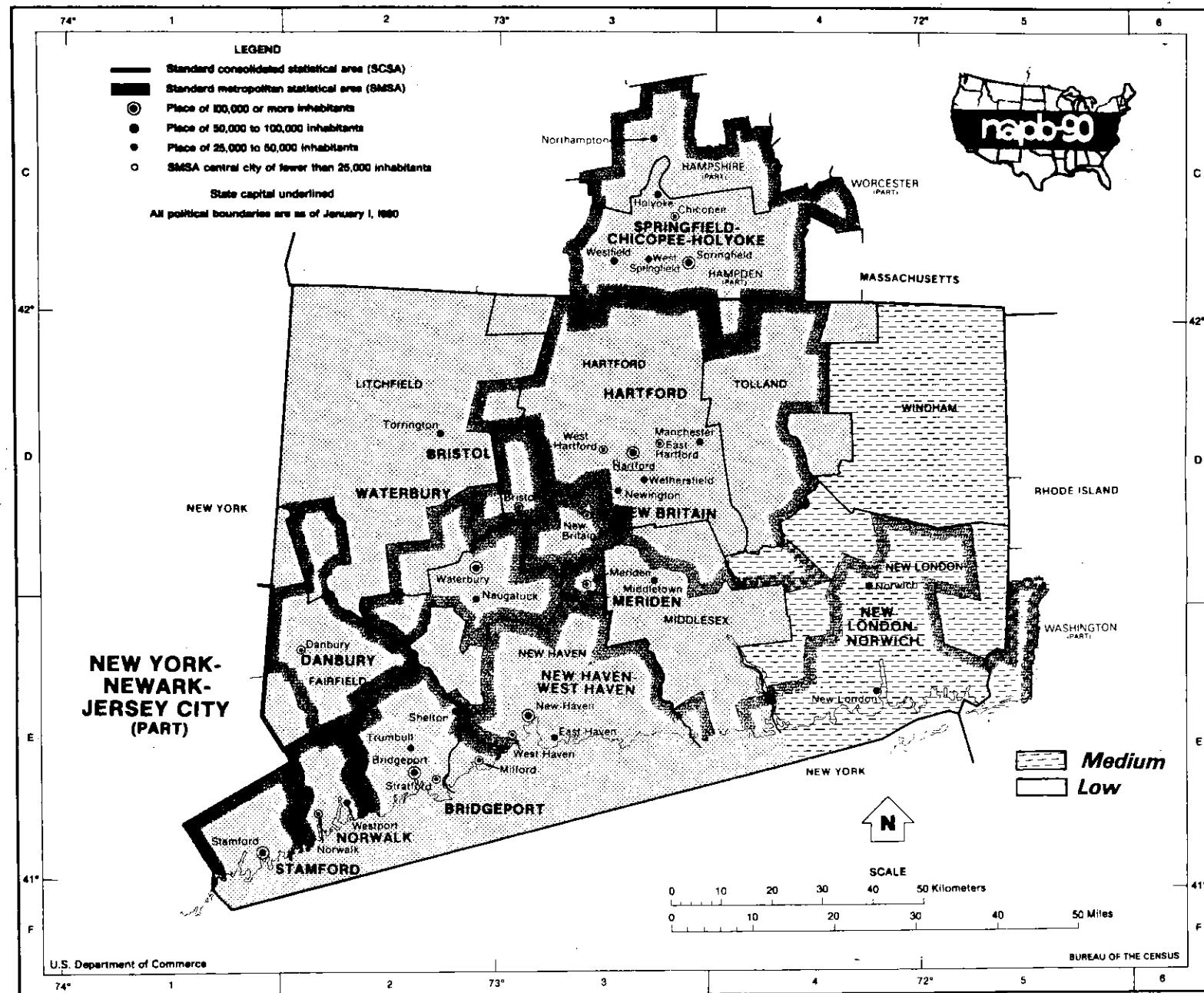
*Interim data; to be corrected

F E M A R E G I O N I -- F A L L O U T R I S K S U M M A R Y

Estimated 1985 Population: 12,320,207
 Land Area: 61,682 square miles

STATE	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Connecticut	---	---	---	---	341 261	1 184	2 824 200	3 688
Maine	---	---	---	---	88 277	6 721	1 072 601	24 274
Massachusetts	---	---	---	---	655 822	1 514	4 847 653	4 983
New Hampshire	---	---	---	---	---	---	990 437	8 992
Rhode Island	---	---	---	---	578 010	416	387 461	638
Vermont	---	---	---	---	237 450	3 209	297 035	6 063
TOTAL REGION I	---	---	---	---	1 900 820	13 044	10 419 387	48 638

FEMA Region 1 – CONNECTICUT – Potential Fallout

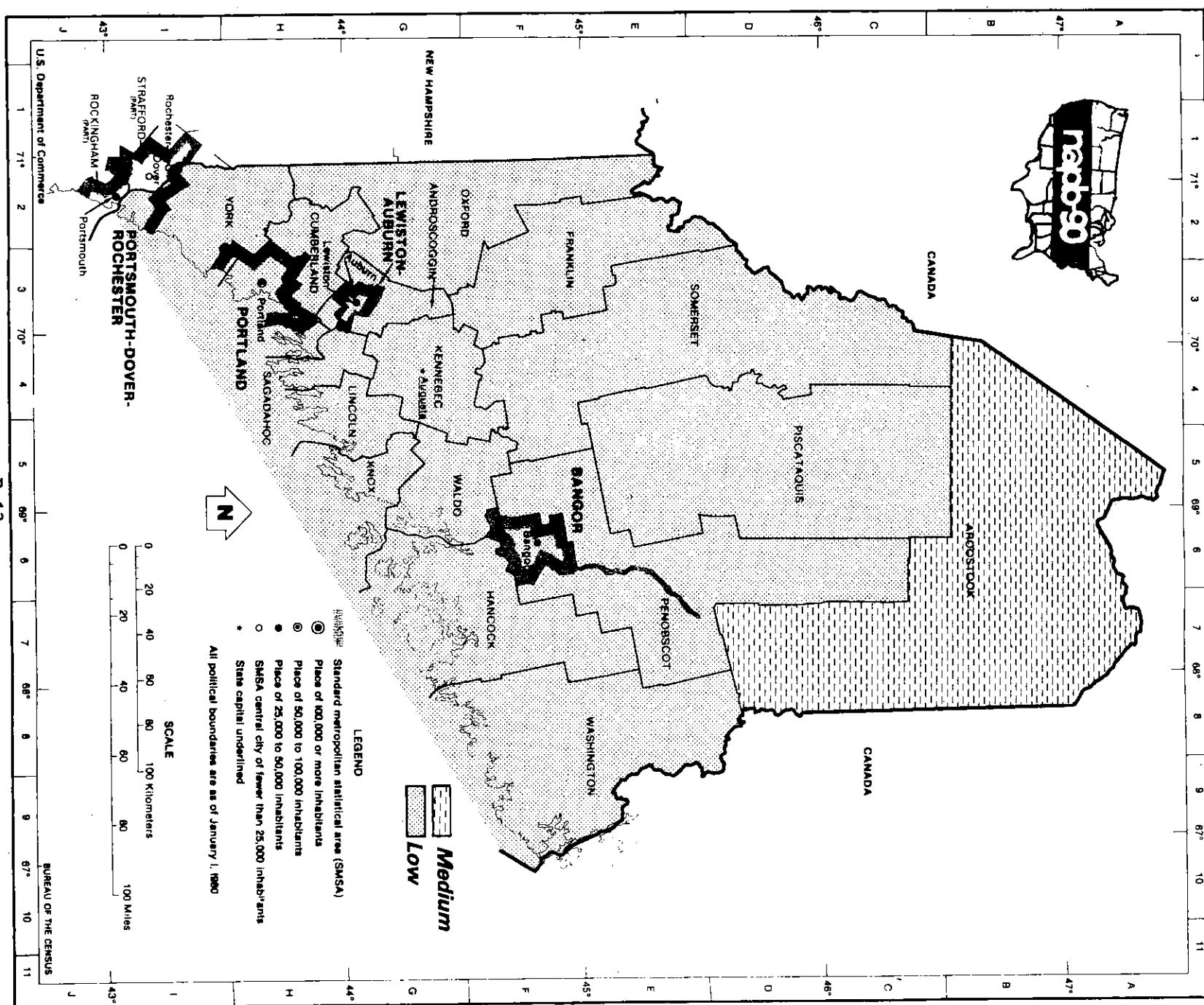


S T A T E O F C O N N E C T I C U T - - F A L L O U T R I S K

Estimated 1985 Population: 3,165,461
Land Area: 4,872 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Fairfield						818 293	632
Hartford						819 457	739
Litchfield						160 885	922
Middlesex						133 498	373
New Haven						771 603	610
New London			246 137	669			
Tolland						120 464	412
Windham			95 124	515			
 TOTAL STATE	---	---	---	---	341 261 1 184		2 824 200 3 688	

FEMA Region 1 – MAINE – *Potential Fallout*

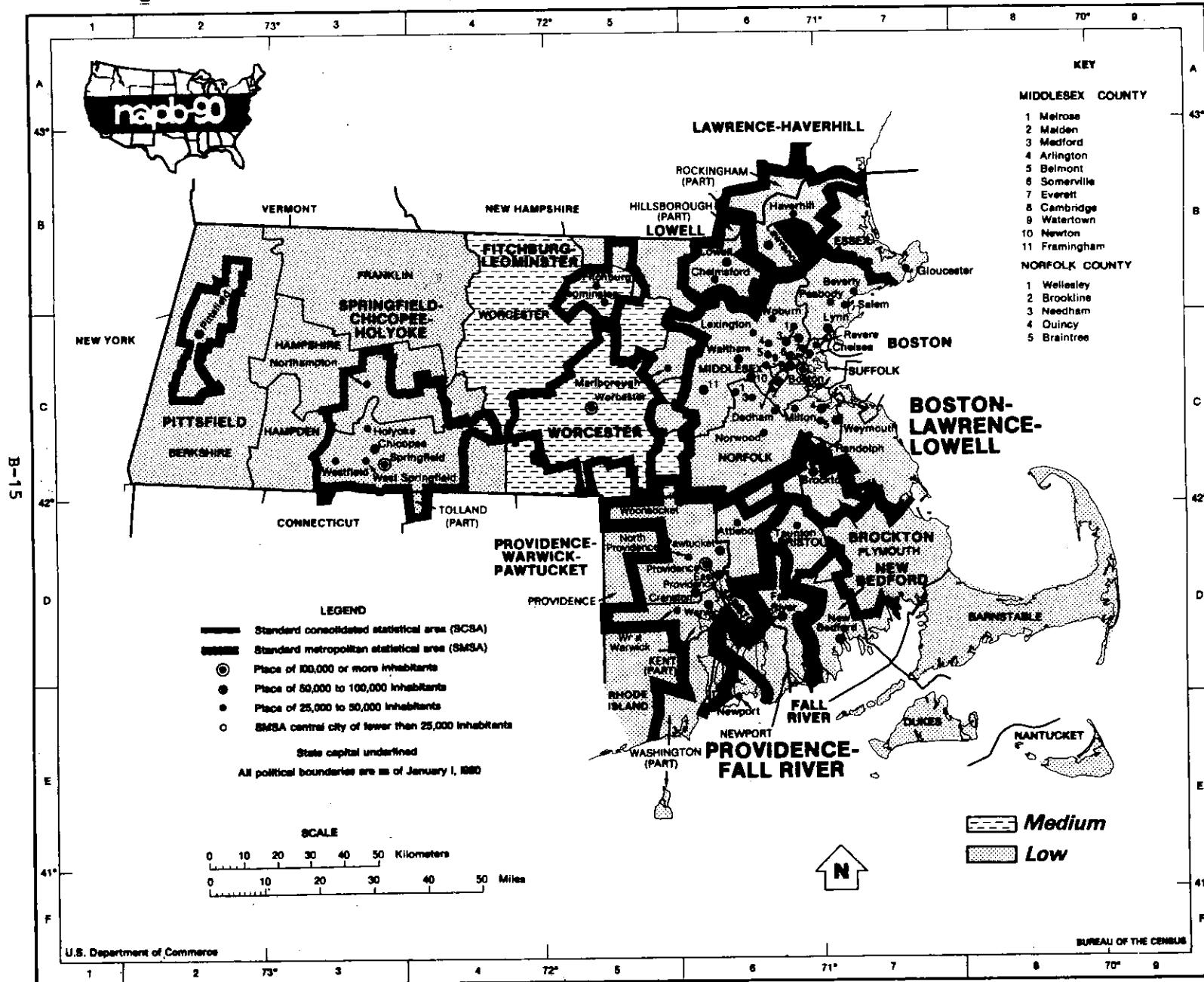


S T A T E O F M A I N E - - F A L L O U T R I S K

Estimated 1985 Population: 1,160,878
 Land Area: 30,995 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Androscoggin						100	112
Aroostook		88	277	6	721		477
Cumberland						225	058
Franklin						29	408
Hancock						43	805
Kennebec						112	723
Knos						34	496
Lincoln						27	958
Oxford						49	771
Penobscot						138	771
Piscataquis						18	065
Sagadahoc						30	689
Somerset						46	806
Waldo						26	692
Washington						33	858
York						154	389
STATE TOTAL	---		88	277	6	721	1 072	601
							24	274

FEMA Region 1 – MASSACHUSETTS – Potential Fallout

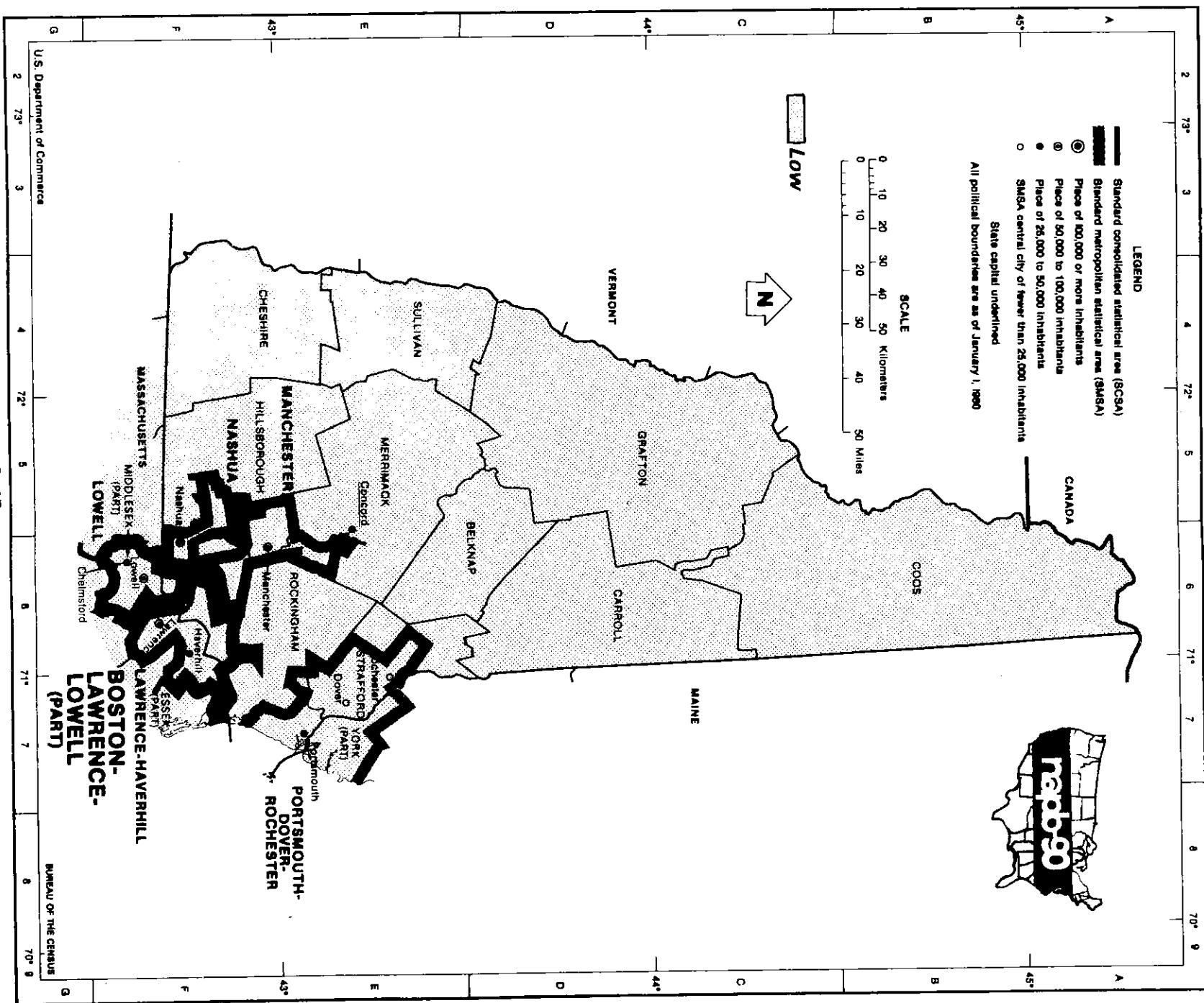


S T A T E O F M A S S A C H U S E T S - - F A L L O U T R I S K

Estimated 1985 Population: 5,503,475
 Land Area: 6,497 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Bristol						478 662	557
Dukes						10 337	102
Essex						648 793	495
Franklin						64 987	702
Hampden						442 601	618
Hampshire						141 781	528
Middlesex						1 369 905	822
Nantucket						6 070	47
Norfolk						602 837	400
Plymouth						420 708	655
Suffolk						660 972	57
Worcester				655 822	1 514		
TOTAL STATE	---	---	---	---	655 822	1 514	4 847 653	4 983

FEMA Region 1 – NEW HAMPSHIRE – *Potential Fallout*

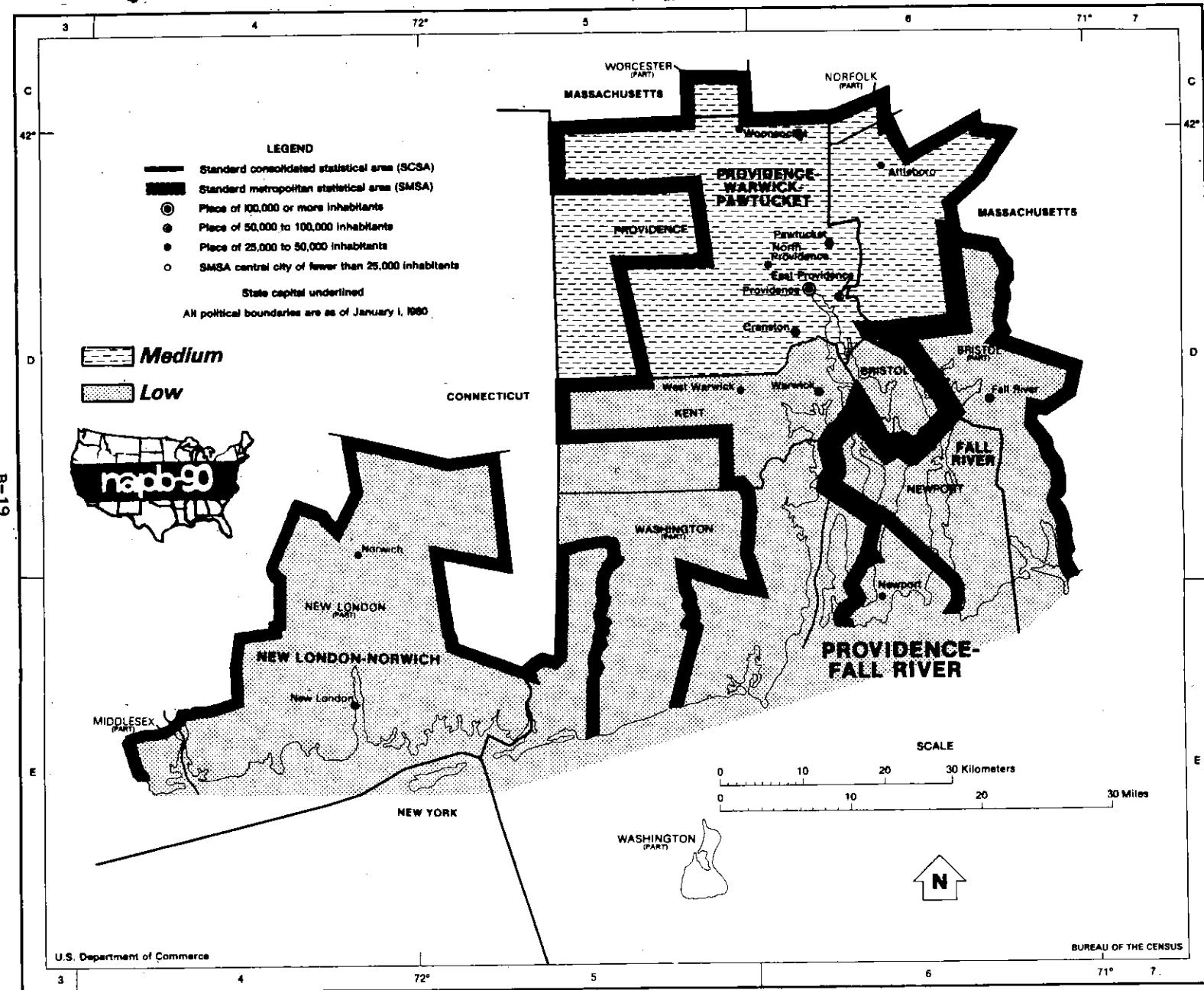


S T A T E O F N E W H A M P S H I R E -- F A L L O U T R I S K

Estimated 1985 Population: 990,437
Land Area: 8,992 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Belknap						46 034	404
Carroll						30 428	932
Cheshire						64 644	711
Coos						33 352	1 805
Grafton						68 735	1 719
Hillsborough						299 744	876
Merrimack						103 605	936
Rockingham						212 199	699
Strafford						93 819	370
Sullivan						37 877	540
TOTAL STATE	---	---	---	---	---	---	990 437	8 992

FEMA Region 1 — RHODE ISLAND — Potential Fallout

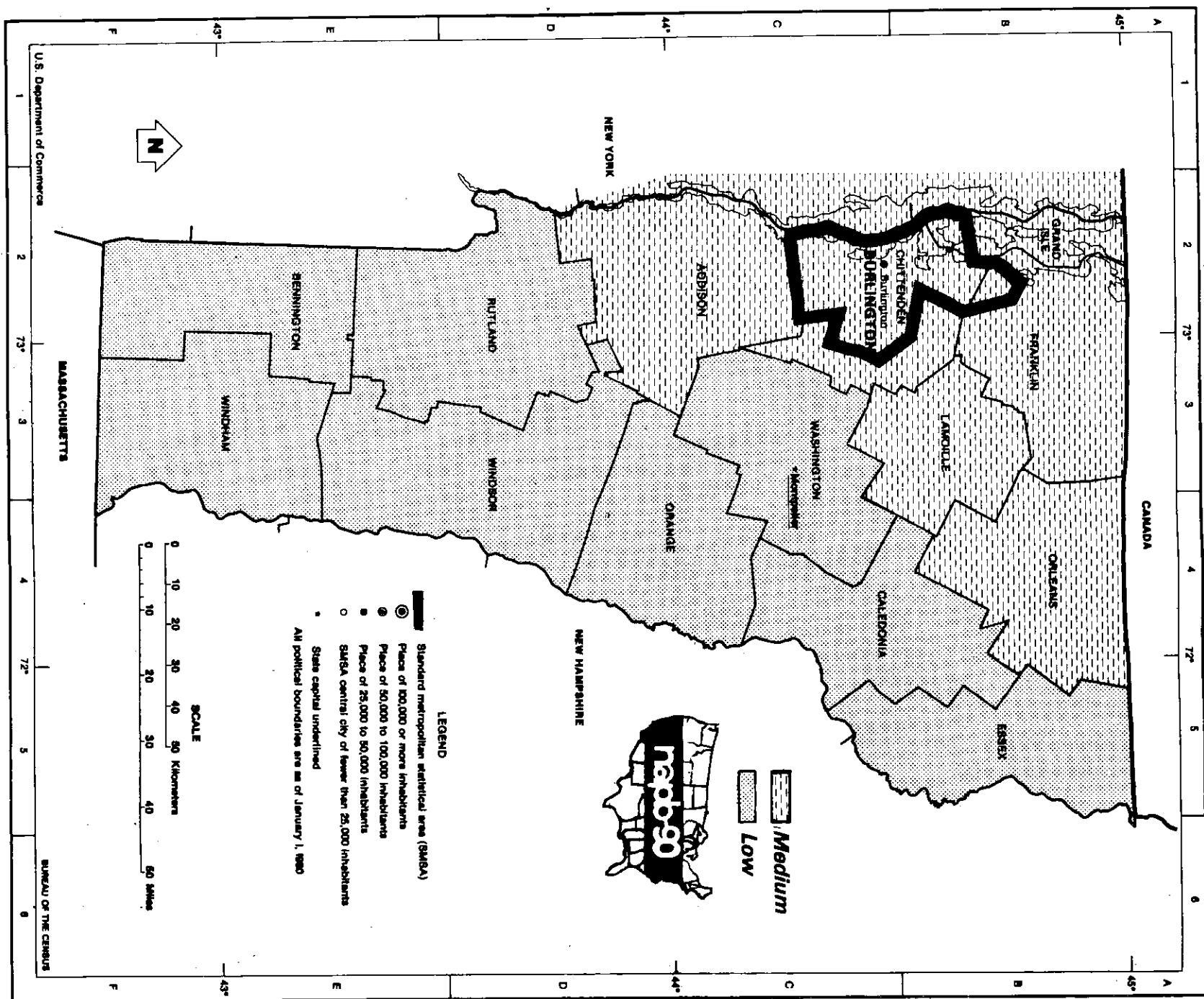


S T A T E O F R H O D E I S L A N D -- F A L L O U T R I S K

Estimated 1985 Population: 965,471
Land Area: 1,054 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Bristol						46 484	26
Kent						158 247	172
Newport						84 236	107
Providence				578 010	416		
Washington						98 494	333
TOTAL STATE	---	---	---	---	578 010	416	387 461	638

FEMA Region 1 -- VERMONT -- Potential Fallout



S T A T E O F V E R M O N T - - F A L L O U T R I S K

Estimated 1985 Population: 534,485
 Land Area: 9,272 square miles

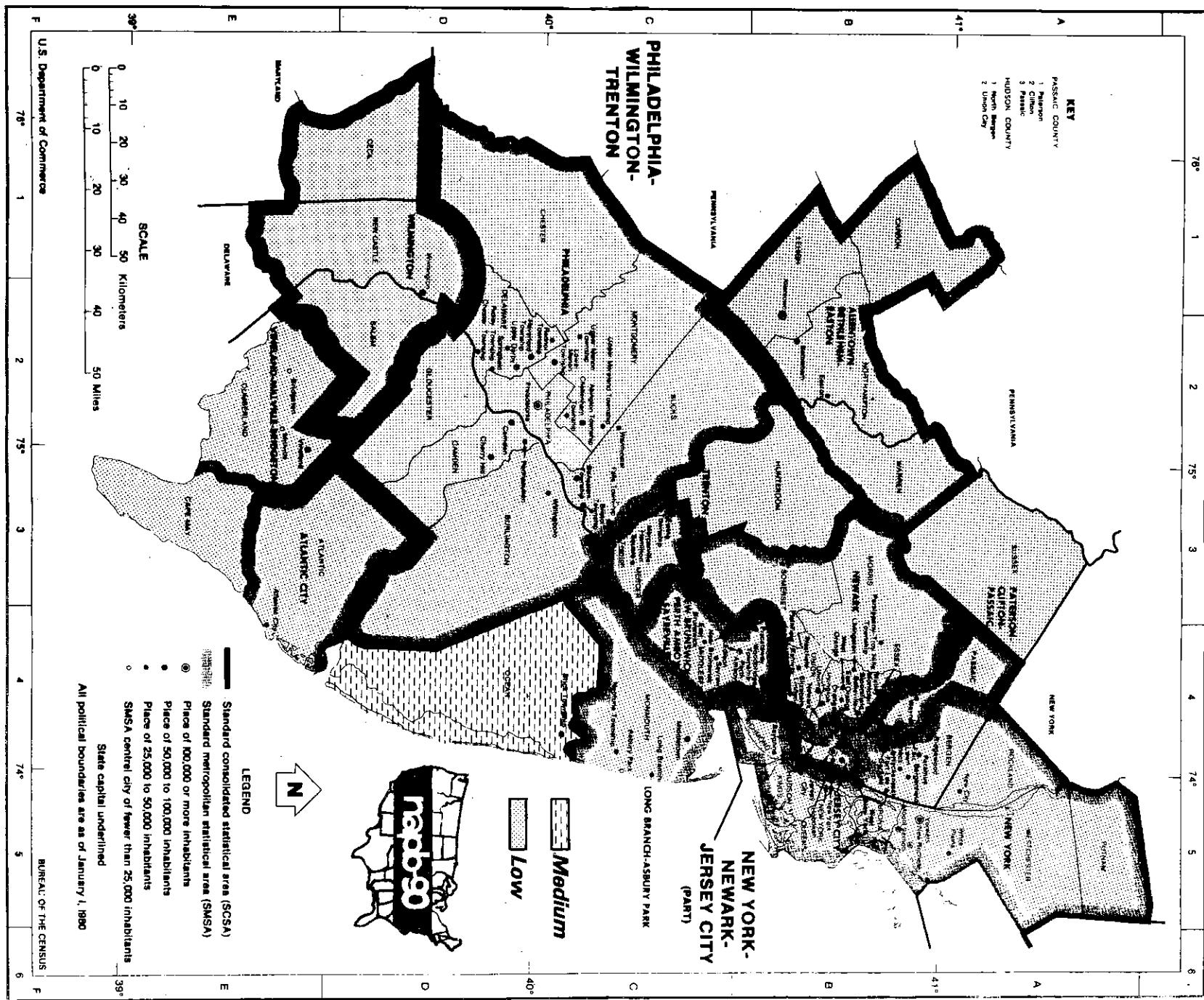
COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Addison				31 248	773		
Bennington						34 937	676
Caledonia						26 478	651
Chittenden				123 194	540		
Essex						6 646	666
Franklin				36 337	649		
Grand Isle				5 002	89		
Lamoille				17 676	461		
Orange						24 019	690
Orleans				23 993	697		
Rutland						59 226	932
Washington						53 831	690
Windham						38 786	786
Windsor						53 112	972
TOTAL STATE	---	---	---	---	237 450	3 209	297 035	6 063

F E M A R E G I O N I I - - F A L L O U T R I S K S U M M A R Y

Estimated 1985 Population: 28,626,118
 Land Area: 58,436 square miles

STATE	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/LT 6000R LT 15000R]		MEDIUM RISK [EQ/LT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
New Jersey				382 488	641	7 168 673	6 827
New York				709 012	9 757	17 065 131	37 620
Puerto Rico						3 196 520	3 459
Virgin Islands						104 294	132
TOTAL REGION II	---	---	---	---	1 091 500	10 398	27 534 618	48 038

FEMA Region 2 — NEW JERSEY — *Potential Fallout*

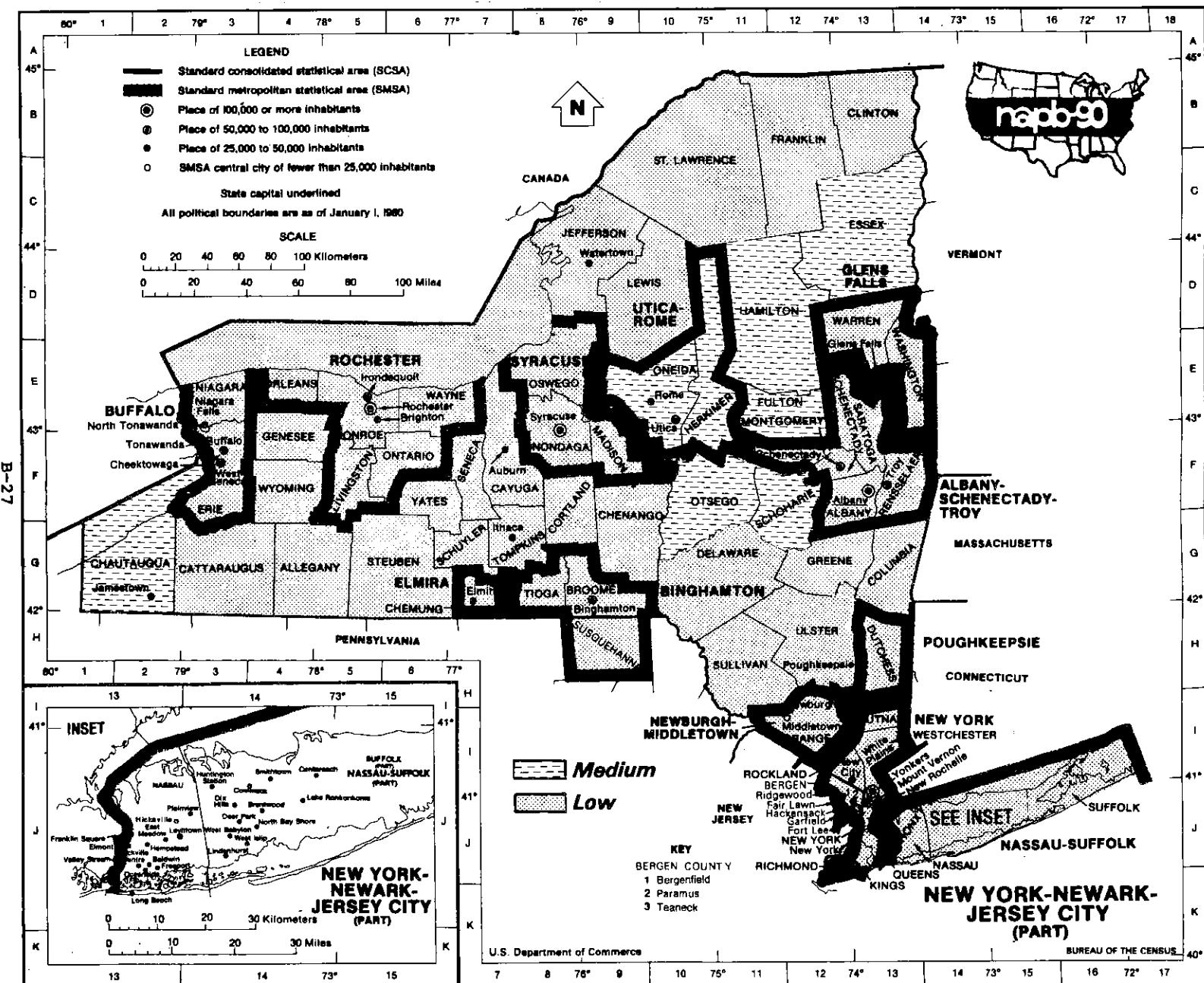


S T A T E O F N E W J E R S E Y - - F A L L O U T R I S K

Estimated 1985 Population: 7,551,161
 Land Area: 7,468 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Atlantic						202 977	568
Bergen						843 976	237
Burlington						382 675	808
Camden						484 532	223
Cape May						90 810	263
Cumberland						133 582	498
Essex						826 857	127
Gloucester						209 076	327
Hudson						560 606	46
Hunterdon						93 887	427
Mercer						315 518	227
Middlesex						623 943	316
Monmouth						530 780	472
Morris						420 366	471
Ocean				382 488	641		
Passaic						457 120	187
Salem						66 592	338
Somerset						212 791	305
Sussex						121 242	525
Union						505 786	103
Warren						85 557	359
STATE TOTAL	---	---	---	---	382 488	641	7 168 673	6 827

FEMA Region 2 – NEW YORK – *Potential Fallout*



S T A T E O F N E W Y O R K - - F A L L O U T R I S K

Estimated 1985 Population: 17,774,143
 Land Area: 47,377 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 3000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Albany		285 433	524
Allegany		51 343	1 032
Bronx		1 173 939	42
Broome		213 451	712
Cattaraugus		86 102	1 306
Cayuga		80 381	695
Chautauqua		146 038	1 064			
Chemung		92 406	411
Chenango		50 447	897
Clinton		80 924	1 043
Columbia		61 646	638
Cortland		47 988	500
Delaware		46 664	1 440
Dutchess		255 073	804
Erie		977 687	1 046
Essex		36 733	1 807			
Franklin		43 604	1 642
Fulton		56 407	497			
Genesee		56 691	495
Greene		41 477	648
Hamilton		4 806	1 721			
Herkimer		67 691	1 417			
Jefferson		89 068	1 273
Kings		2 259 554	70
Lewis		24 945	1 283

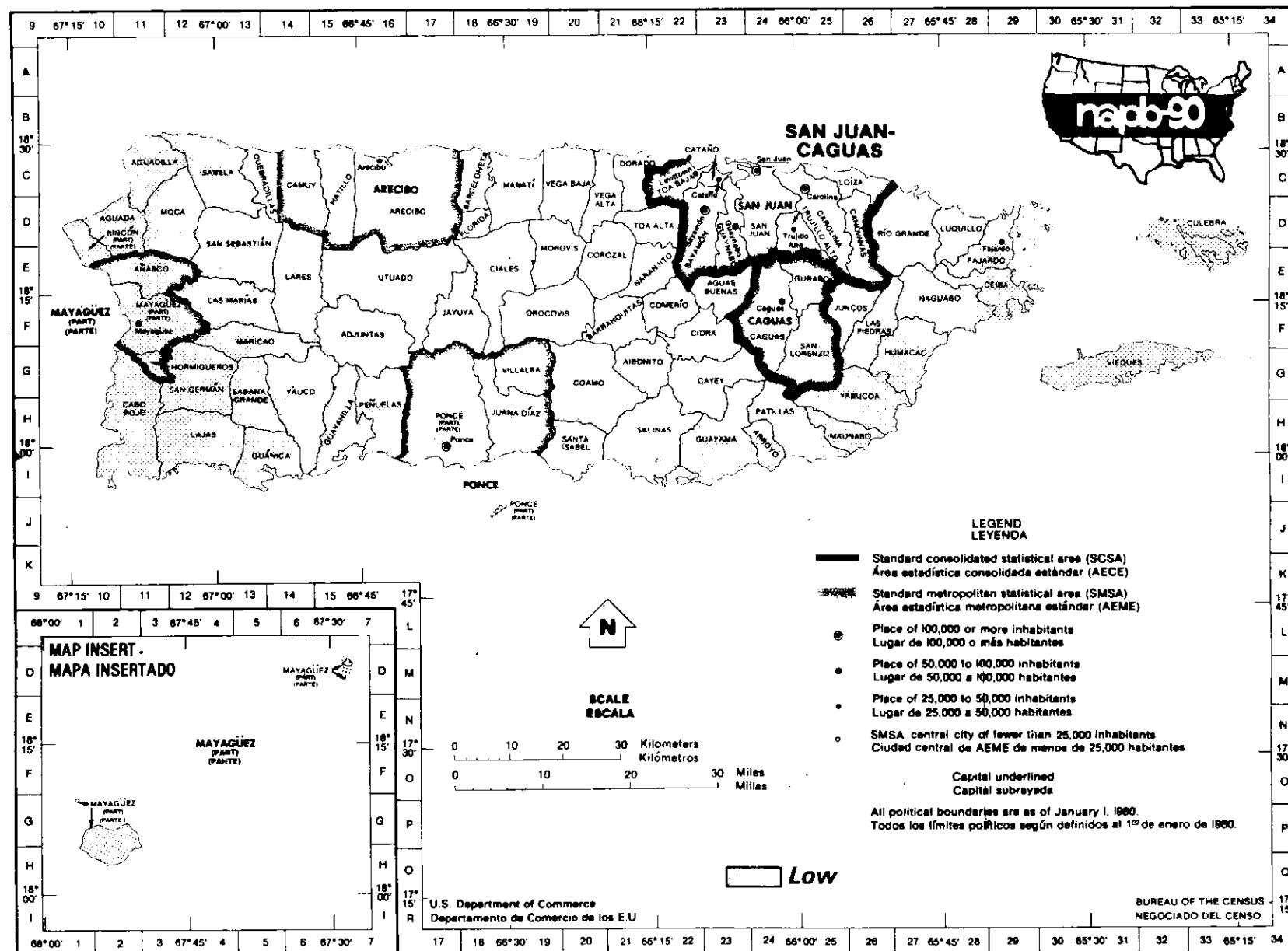
STATE OF NEW YORK (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Livingston						58 866	633
Madison						67 406	656
Monroe						713 316	663
Montgomery		53 004	404				
Nassau						1 342 306	287
New York						1 463 052	22
Niagara						217 492	526
Oneida		253 963	1 219				
Onondaga						464 441	785
Ontario						92 890	644
Orange						276 972	826
Orleans						39 425	391
Oswego						120 383	954
Otsego		59 978	1 004				
Putnam						81 774	231
Queens						1 916 194	108
Rensselaer						152 266	655
Richmond						375 223	59
Rockland						265 505	175
St Lawrence						113 496	2 728
Saratoga						161 216	810
Schenectady						151 139	206
Schoharie		30 392	624				
Schuyler						17 721	329
Seneca						32 754	327

STATE OF NEW YORK (Continued)

COUNTY	VERY HIGH RISK POPULATION	AREA	HIGH RISK POPULATION	AREA	MEDIUM RISK POPULATION	AREA	LOW RISK POPULATION	AREA
Steuben		99 365		1 396	
Suffolk		1 322 809		912	
Sullivan		67 719		976	
Tioga		50 776		519	
Tompkins		88 051		477	
Ulster		163 741		1 131	
Warren		55 645		882	
Washington		56 349		836	
Wayne		88 815		603	
Westchester		866 945		438	
Wyoming		40 761		595	
Yates		21 495		339	
TOTAL STATE	---	---	---	---	709 012	9 757	17 065	131 37 620

FEMA Region 2 – PUERTO RICO – *Potential Fallout*



T E R R I T O R Y O F P U E R T O R I C O - - F A L L O U T R I S K

Estimated 1985 Population: 3,196,520
Land Area: 3,459 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
All Counties						3 196 520	3 459
TOTAL TERRITORY	---		---		---		3 196 520	3 459

[MAP WILL BE FURNISHED SEPARATELY]

REGION II - TERRITORY OF THE VIRGIN ISLANDS - Potential Fallout

T E R R I T O R Y O F T H E V I R G I N I S L A N D S - - F A L L O U T R I S K

Estimated 1985 Population: 104,294
 Land Area: 132 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
All Counties						104 294	132
TOTAL TERRITORY	---		---		---		104 294	132

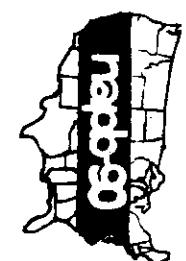
F E M A R E G I O N I I I - - F A L L O U T R I S K S U M M A R Y

Estimated 1985 Population: 25,107,876
 Land Area: 120,550 square miles

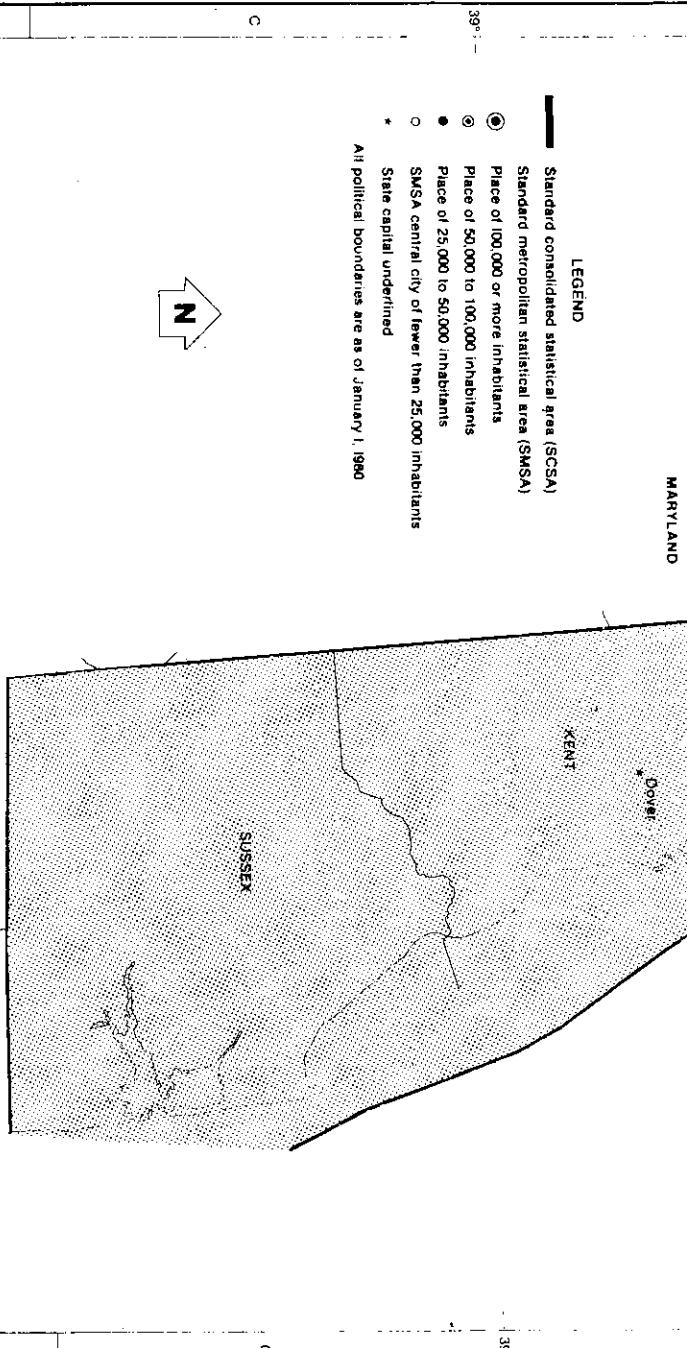
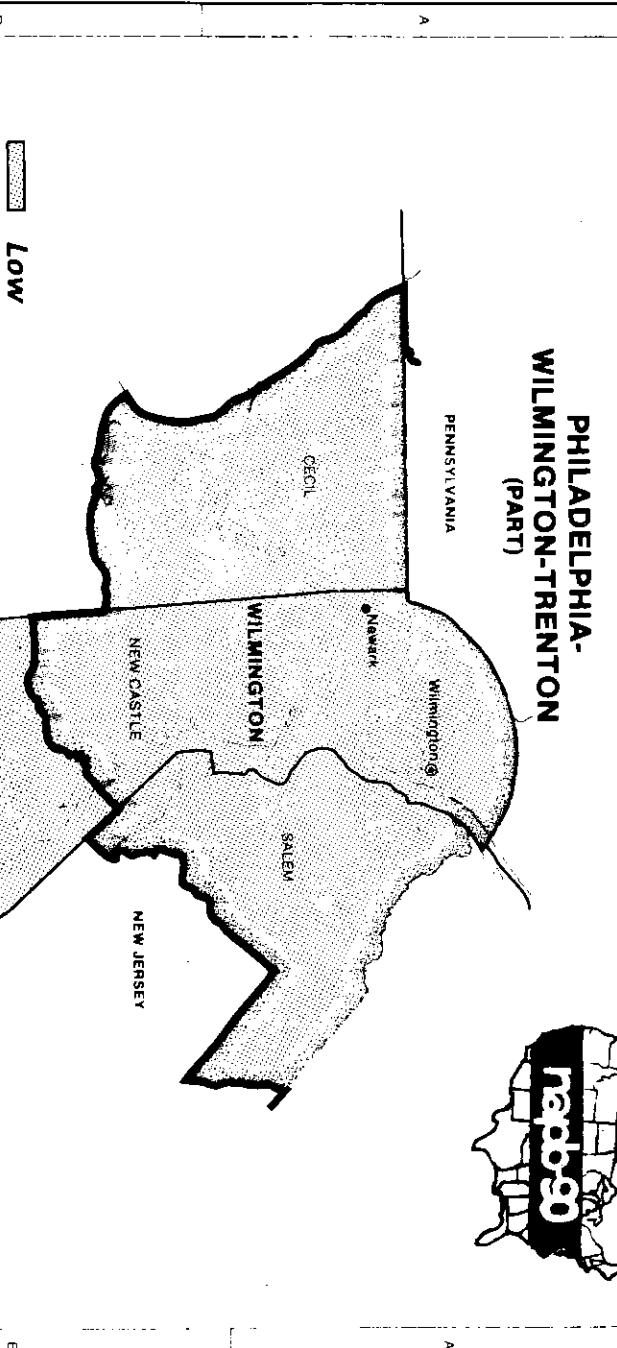
STATE	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Delaware	---	---	---	---	---	---	530 229	1 933
Dist.of Columbia	---	---	---	---	---	---	618 906	63
Maryland	---	---	---	---	---	---	4 381 743	9 838
Pennsylvania	---	---	---	---	498 309	2 487	11 410 774	42 405
Virginia	---	---	---	---	---	---	5 715 659	39 700
West Virginia	---	---	---	---	---	---	1 952 256	24 124
TOTAL REGION III	---	---	---	---	489 309	2 487	24 609 567	118 063

FEMA Region 3 – DELAWARE – Potential Fallout

PHILADELPHIA- WILMINGTON-TRENTON (PART)



40° 7 8 76° 9 10 75° 11



D U.S. Department of Commerce

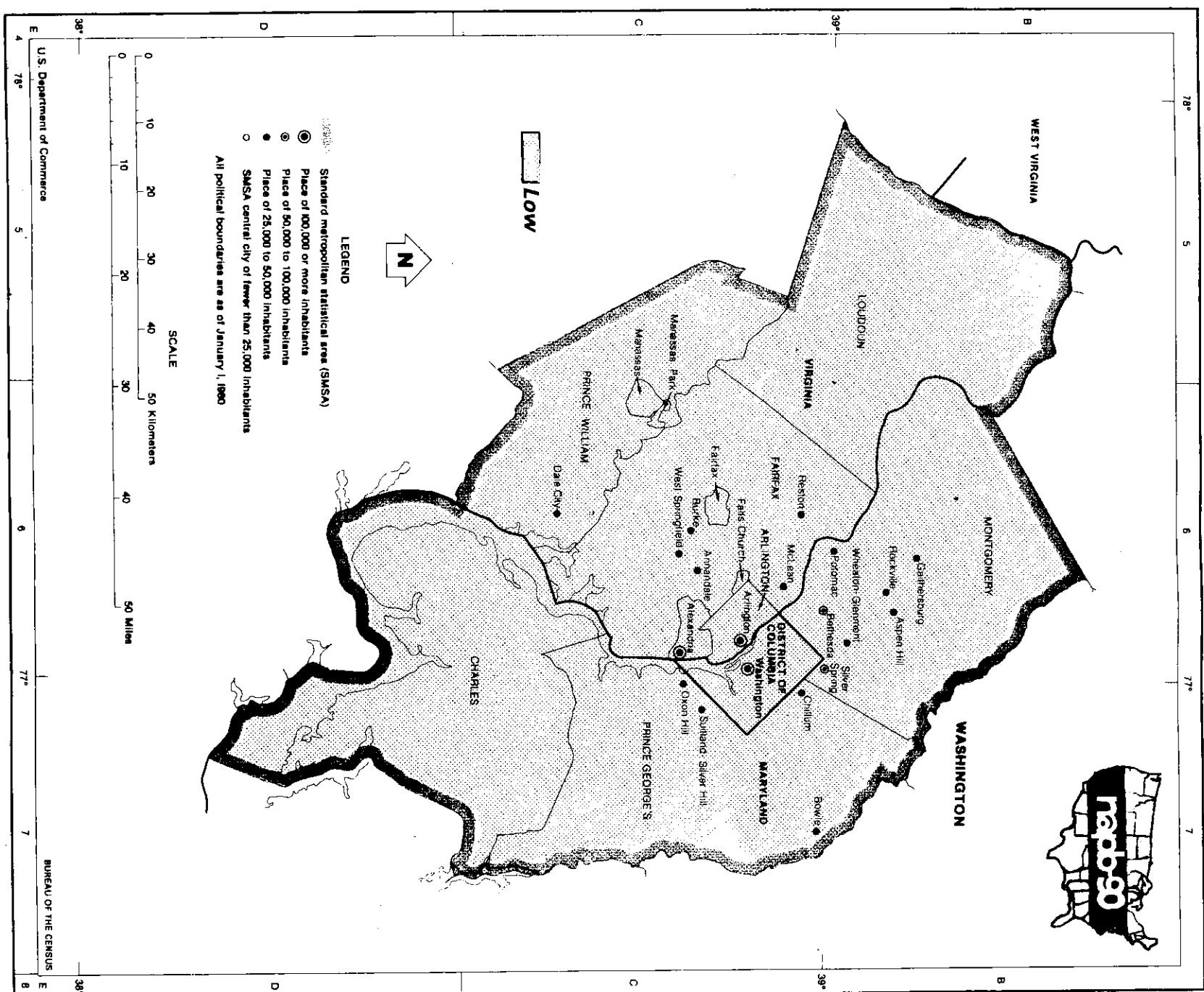
7 8 9 10 11

S T A T E O F D E L A W A R E -- F A L L O U T R I S K

Estimated 1985 Population: 530,229
 Land Area: 1,933 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Kent		15 037	595
New Castle		409 985	396
Sussex		105 207	942
TOTAL STATE	---	---	---	---	---	---	530 229	1 933

FEMA Region 3 – DISTRICT OF COLUMBIA – *Potential Fallout*

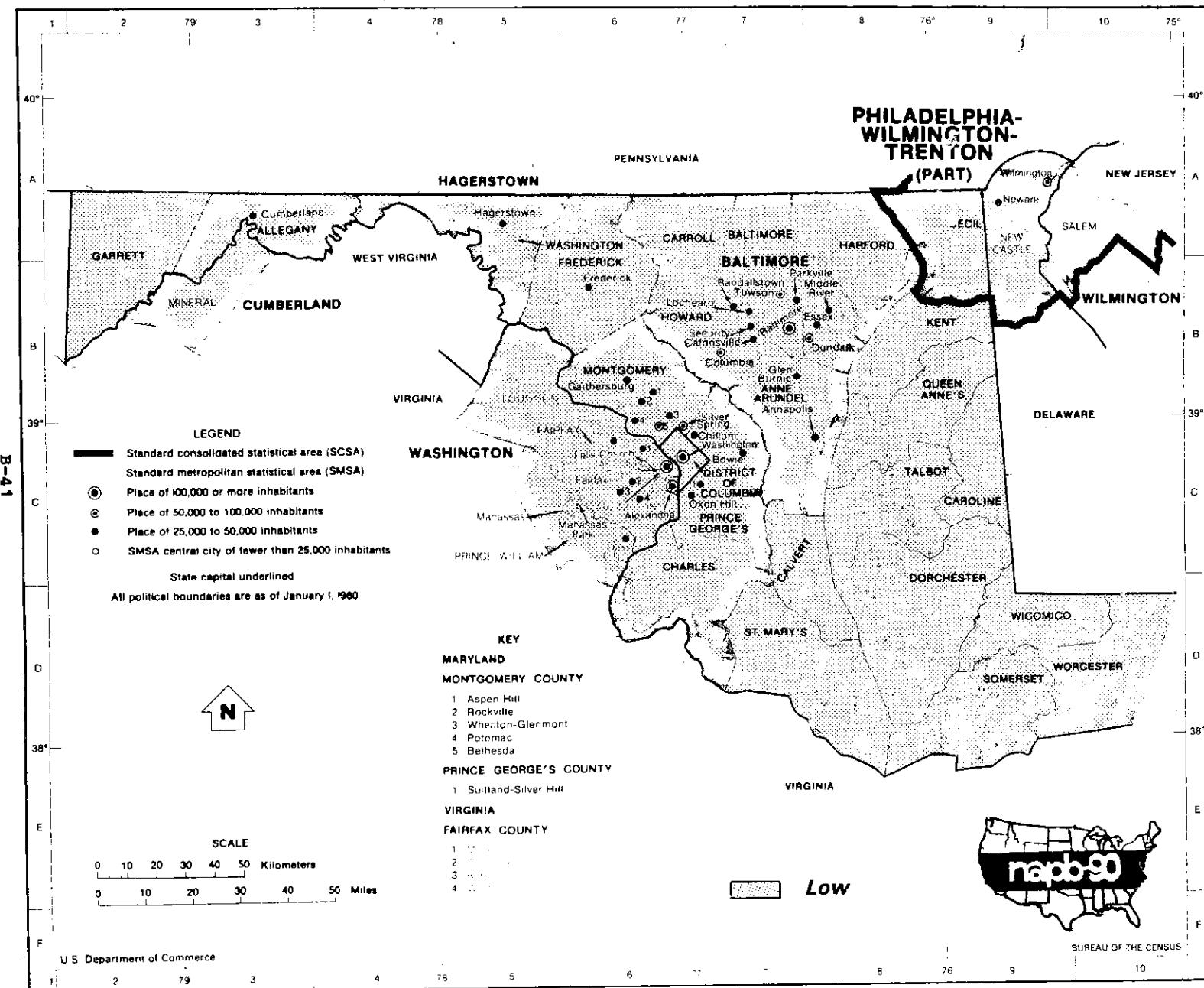


D I S T R I C T O F C O L U M B I A -- F A L L O U T R I S K

Estimated 1985 Population: 618,906
 Land Area: 63 square miles

COUNTY	VERY HIGH RISK [GT 15000R]	POPULATION	HIGH RISK [EQ/GT 6000R LT 15000R]	POPULATION	MEDIUM RISK [EQ/GT 3000R LT 6000R]	POPULATION	LOW RISK [LT 3000R]	POPULATION	AREA
	AREA		AREA		AREA		AREA		
Dist. of Columbia								618 906	63
TOTAL DISTRICT	---	---	---	---	---	---	---	618 906	63

FEMA Region 3 – MARYLAND – *Potential Fallout*

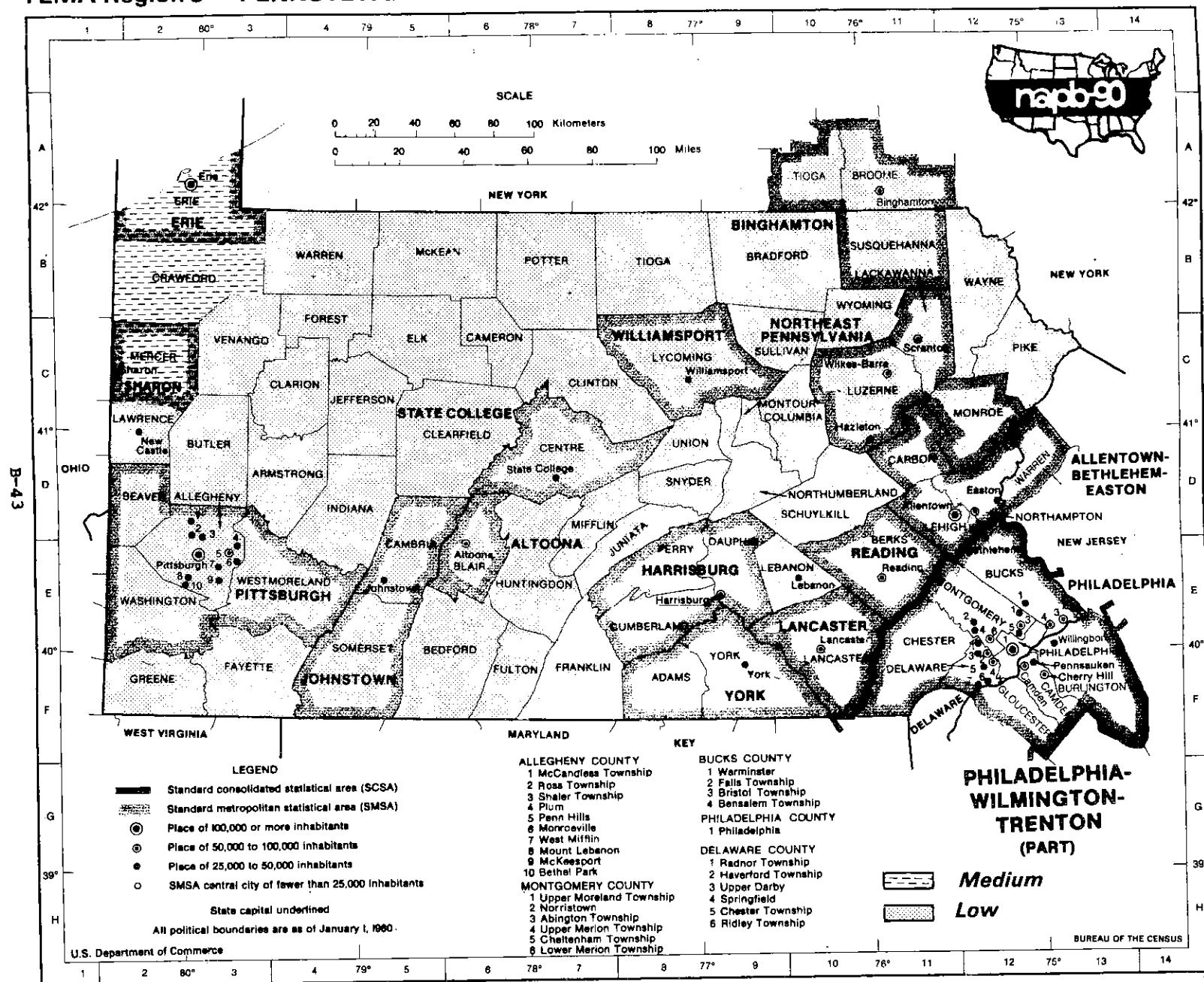


STATE OF MARYLAND -- FALLOUT RISK

Estimated 1985 Population: 4,381,743
 Land Area: 9,838 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Allegany						76 002	421
Anne Arundel						393 425	419
Baltimore						677 372	598
Calvert						40 418	213
Caroline						23 715	321
Carroll						106 853	452
Cecil						66 776	359
Charles						84 030	452
Dorchester						29 717	593
Frederick						126 295	663
Garrett						26 913	657
Harford						152 156	447
Howard						139 967	251
Kent						16 679	278
Montgomery						635 241	495
Prince Georges						678 149	487
Queen Annes						28 229	372
St Marys						64 355	373
Somerset						18 515	339
Talbot						27 117	259
Washington						111 651	455
Wicomico						66 361	379
Worcester						34 039	475
Baltimore City						757 768	80
TOTAL STATE	---	---	---	---	---	---	4 381 743	9 838

FEMA Region 3 – PENNSYLVANIA – Potential Fallout



S T A T E O F P E N N S Y L V A N I A -- F A L L O U T R I S K

Estimated 1985 Population: 11,909,083
 Land Area: 44,892 square miles

COUNTY	VERY HIGH RISK [GT 15000R]	POPULATION	HIGH RISK [EQ/GT 6000R LT 15000R]	POPULATION	MEDIUM RISK [EQ/GT 3000R LT 6000R]	POPULATION	LOW RISK [LT 3000R]	POPULATION	AREA
	AREA	AREA	AREA	AREA	AREA	AREA	AREA	POPULATION	AREA
Adams		68 459	521	
Allegheny		1 399 652	727	
Armstrong		83 324	646	
Beaver		197 808	436	
Bedford		48 356	1 017	
Berks		318 305	861	
Blair		133 813	527	
Bradford		64 199	1 152	
Bucks		515 874	610	
Butler		152 040	789	
Cambria		175 533	691	
Cameron		6 596	398	
Carbon		54 170	385	
Centre		114 856	1 106	
Chester		339 008	758	
Clarion		42 996	607	
Clearfield		84 733	1 149	
Clinton		39 156	892	
Columbia		61 778	486	
Crawford		89 061	1 011	
Cumberland		186 988	547	
Dauphin		236 650	528	
Delaware		550 418	184	
Elk		37 425	830	
Erie		282 674	804	

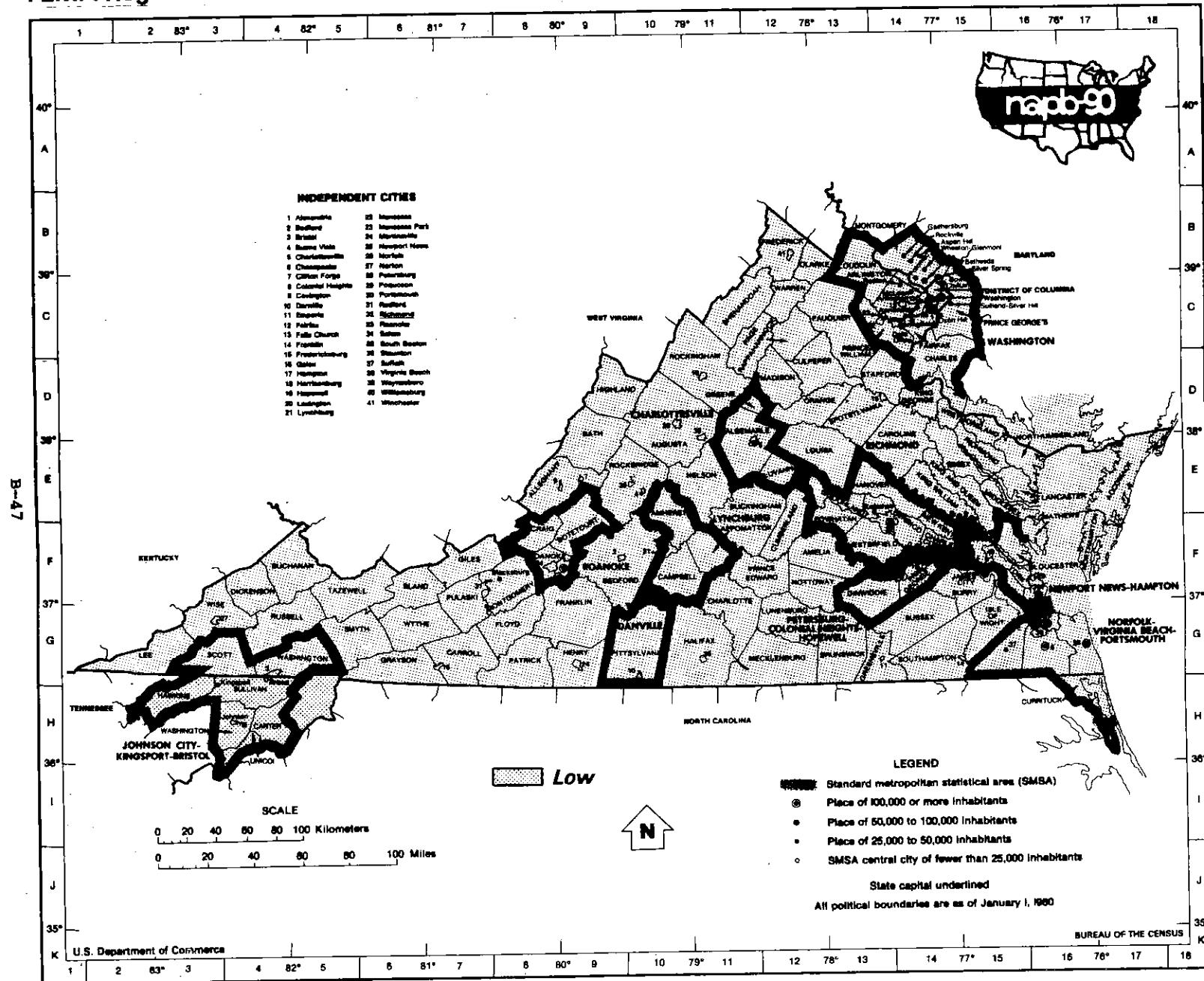
STATE OF PENNSYLVANIA (Continued)

COUNTY	VERY HIGH RISK	HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION
Fayette					159 070	794
Forest					5 018	428
Franklin					116 866	774
Fulton					13 721	437
Greene					41 362	577
Huntingdon					42 811	877
Indiana					93 550	829
Jefferson					49 051	656
Juniata					19 980	392
Lackawanna					222 969	461
Lancaster					386 020	952
Lawrence					105 403	363
Lebanon					111 919	363
Lehigh					277 519	348
Luzerne					334 652	891
Lycoming					116 783	1 237
McKean					48 882	979
Mercer		126 574	672			
Mifflin					46 580	413
Monroe					79 149	609
Montgomery					662 853	486
Montour					17 066	131
Northampton					232 130	376
Northumberland					100 144	461
Perry					38 081	557
Philadelphia					1 636 321	136
Pike					21 143	551
Potter					18 490	1 081
Schuylkill					158 879	781
Snyder					35 824	329

STATE OF PENNSYLVANIA (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Somerset		82 007	1 073
Sullivan		6 159	451
Susquehanna		39 233	826
Tioga		40 093	1 131
Union		33 796	317
Venango		64 445	679
Warren		47 707	885
Washington		217 162	858
Wayne		38 414	731
Westmoreland		385 141	1 033
Wyoming		27 557	399
York		324 687	906
TOTAL STATE	---	---	---	---	498 309	2 487	11 410 774	42 405

FEMA Region 3 – VIRGINIA – *Potential Fallout*



STATE OF VIRGINIA -- FALLOUT RISK

Estimated 1985 Population: 5,715,659
 Land Area: 39,700 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Accomack		30 877	476
Albemarle		59 605	725
Alleghany		13 541	446
Amelia		8 247	357
Amherst		29 207	478
Appomattox		12 380	336
Arlington		154 597	26
Augusta		54 869	989
Bath		5 302	537
Bedford		37 379	747
Bland		6 584	359
Botetourt		23 987	545
Brunswick		16 369	563
Buchanan		37 878	504
Buckingham		11 972	583
Campbell		46 194	505
Caroline		18 878	536
Carroll		28 517	478
Charles City		6 751	181
Charlotte		11 840	476
Chesterfield		164 500	434
Clarke		10 212	178
Craig		4 029	330
Culpeper		23 367	382
Cumberland		7 883	300

STATE OF VIRGINIA (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Dickenson		20 223	331
Dinwiddie		21 091	507
Essex		8 754	263
Fairfax		692 187	393
Fauquier		40 110	651
Floyd		11 749	381
Fluvanna		10 519	290
Franklin		37 107	683
Frederick		35 630	415
Giles		17 799	362
Gloucester		25 841	225
Goochland		12 676	281
Grayson		16 832	446
Greene		8 522	157
Greenville		10 082	300
Halifax		29 663	816
Hanover		52 693	468
Henrico		195 226	238
Henry		56 311	382
Highland		2 797	416
Isle of Wight		23 553	319
James City		25 364	153
King & Queen		5 897	317
King George		11 204	180
King William		9 888	278
Lancaster		10 760	133
Lee		27 010	437
Loudoun		63 985	521
Louisa		18 918	497
Lunenburg		12 155	432

STATE OF VIRGINIA (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Madison						10 609	322
Mathews						8 623	87
Mecklenburg						27 798	616
Middlesex						8 286	134
Montgomery						65 379	390
Nelson						12 336	475
New Kent						10 111	213
Northhampton						14 097	226
Northumberland						9 918	185
Nottoway						14 182	317
Orange						19 053	342
Page						19 593	313
Patrick						17 739	481
Pittsylvania						66 604	995
Powhatan						13 752	261
Prince Edward						16 928	354
Prince George						26 007	266
Prince William						169 165	339
Pulaski						34 978	318
Rappahannock						6 117	267
Richmond						6 816	193
Roanoke						74 101	251
Rockbridge						18 123	603
Rockingham						53 179	865
Russell						33 140	479
Scott						25 669	536
Shenandoah						28 403	512
Smyth						33 437	452
Southampton						19 089	603
Spotsylvania						36 716	404

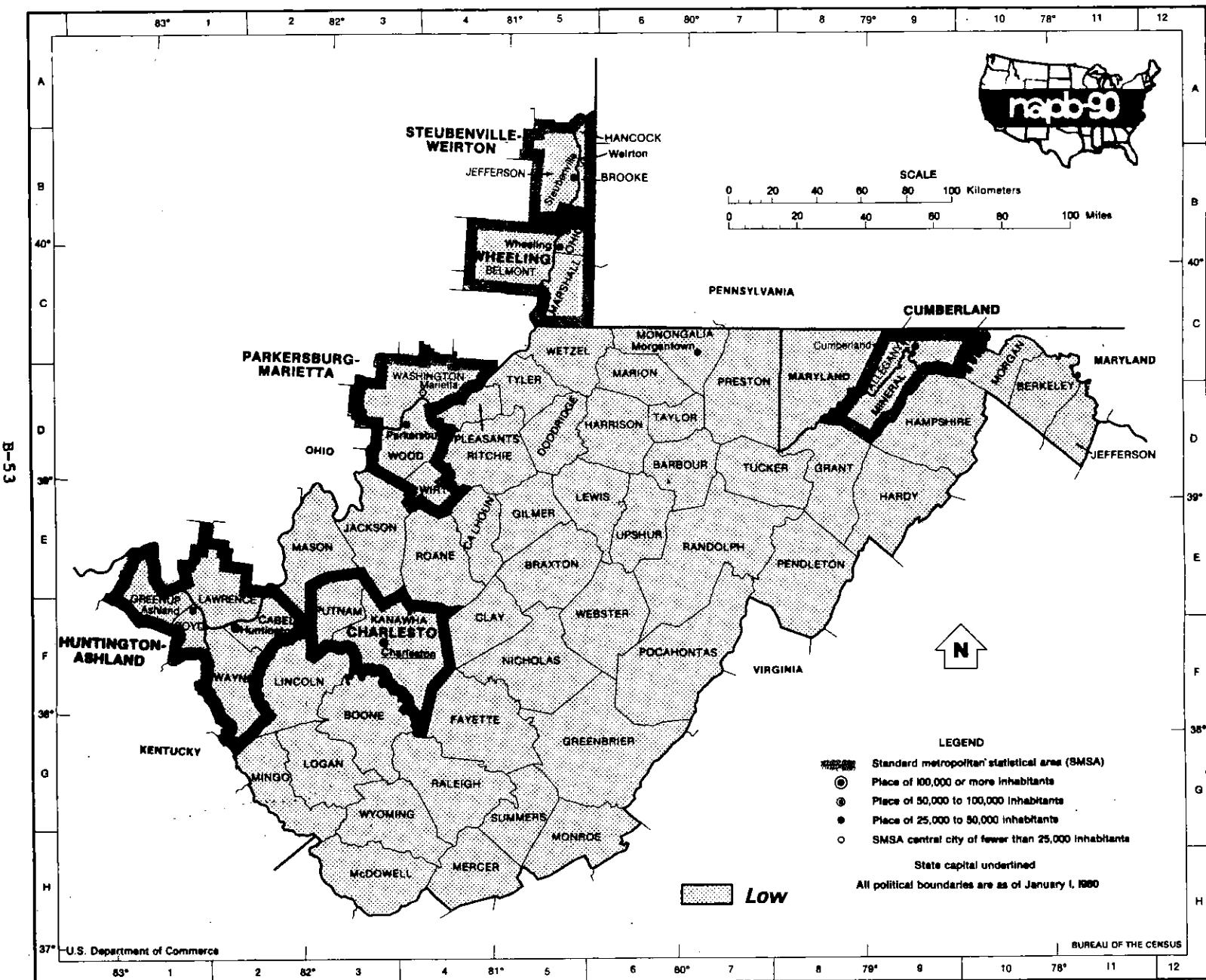
STATE OF VIRGINIA (Continued)

COUNTY	VERY HIGH RISK	HIGH RISK	MEDIUM RISK	LOW RISK			
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	
Stafford				48 799	271	
Surry				6 288	281	
Sussex				10 226	492	
Tazewell				51 785	520	
Warren				22 363	217	
Washington				47 631	563	
Westmoreland				14 279	227	
Wise				45 748	405	
Wythe				25 624	464	
York				40 171	113	
INDEPENDENT CITIES							
Alexandria				107 977	15	
Bedford				6 277	7	
Bristol				18 401	12	
Buena Vista				6 414	3	
Charlottesville				40 757	10	
Chesapeake				128 906	340	
Clifton Forge				4 803	3	
Colonial Heights				17 613	8	
Covington				7 492	4	
Danville				44 426	17	
Emporia				4 822	2	
Fairfax				20 471	6	
Falls Church				9 547	2	
Franklin				7 175	4	
Fredericksburg				19 356	6	
Galax				6 507	8	
Hampton				126 828	51	
Harrisonburg				26 543	6	
Hopewell				24 495	10	
Lexington				6 774	2	

STATE OF VIRGINIA (Continued)

COUNTY	VERY HIGH RISK POPULATION	AREA	HIGH RISK POPULATION	AREA	MEDIUM RISK POPULATION	AREA	LOW RISK POPULATION	AREA
Lynchburg		67 430	49
Manassas		25 643	8
Manassas Park		6 524	2
Martinsville		18 264	11
Newport News		159 965	65
Norfolk		282 850	53
Norton		4 446	7
Petersburg		40 714	23
Poquoson		10 073	17
Portsmouth		108 802	30
Radford		13 415	7
Richmond		219 010	60
Roanoke		100 799	43
Salem		24 293	14
South Boston		7 353	5
Staunton		21 871	8
Suffolk		49 070	409
Virginia Beach		320 264	256
Waynesboro		15 194	8
Williamsburg		11 161	5
Winchester		20 561	9
TOTAL STATE	---	---	---	---	---	---	5 715 659	39 700

FEMA Region 3 — WEST VIRGINIA — "Potential Fallout"



S T A T E O F W E S T V I R G I N I A - - F A L L O U T R I S K

Estimated 1985 Population: 1,952,256
 Land Area: 24,124 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Barbour		16 575	343
Berkeley		50 737	322
Boone		30 926	503
Braxton		14 867	513
Brooke		29 855	90
Cabell		105 480	282
Calhoun		8 754	280
Clay		11 636	346
Dodridge		7 728	321
Fayette		56 777	667
Gilmer		8 570	340
Grant		10 700	480
Greenbrier		36 418	1 025
Hampshire		16 044	644
Hancock		39 360	85
Hardy		10 750	585
Harrison		77 827	417
Jackson		26 271	464
Jefferson		32 646	209
Kanawha		225 530	901
Lewis		18 828	389
Lincoln		23 898	439
Logan		51 109	456
McDowell		46 772	535
Marion		64 570	312

STATE OF WEST VIRGINIA (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Marshall		40 688	305
Mason		26 520	433
Mercer		74 229	420
Mineral		27 657	329
Mingo		38 728	424
Monongalia		78 079	363
Monroe		13 156	473
Morgan		11 225	230
Nicholas		27 964	650
Ohio		60 308	106
Pendleton		7 970	698
Pleasants		7 959	131
Pocahontas		9 687	942
Preston		31 346	651
Putnam		40 735	346
Raleigh		86 190	608
Randolph		29 608	1 040
Ritchie		11 700	454
Roane		15 630	484
Summers		15 424	353
Taylor		16 499	174
Tucker		8 759	421
Tyler		11 013	258
Upshur		24 904	355
Wayne		46 385	508

STATE OF WEST VIRGINIA (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Webster		11 609	556
Wetzel		22 106	359
Wirt		5 281	235
Wood		92 885	368
Wyoming		35 334	502
TOTAL STATE	---	---	---	---	---	---	1 952 256	24 124

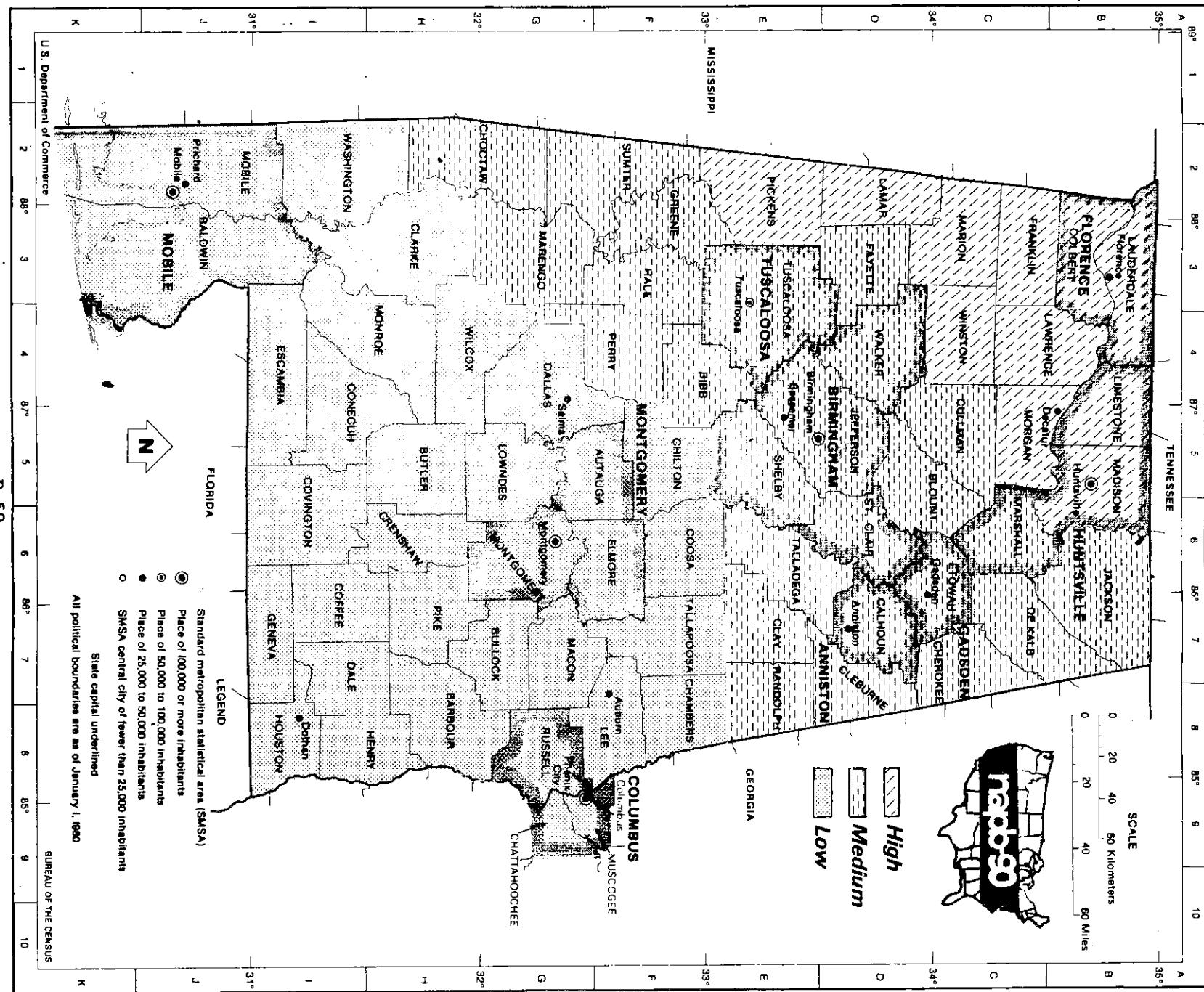
F E M A R E G I O N I V - - F A L L O U T R I S K S U M M A R Y

Estimated 1985 Population: 42,442,705
 Land Area: 379,046 square miles

STATE	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Alabama	---	---	643 193	7 378	1 796 772	19 032	1 519 180	24 329
Florida	---	---	4 566 549	9 312	675 092	2 745	6 641 705	51 340
Georgia	---	---	85 180	380	1 859 305	12 047	3 984 738	45 690
Kentucky	---	---	737 264	10 904	2 138 169	18 344	854 713	10 391
Mississippi*	---	---	1 035 736	21 597	1 086 907	19 343	494 490	6 234
North Carolina	---	---	98 361	554	261 391	2 496	5 874 022	45 793
South Carolina	---	---	291 814	938	191 165	1 683	2 860 443	27 586
Tennessee	58 176	995	2 565 689	21 551	864 696	10 207	1 257 955	8 177
TOTAL REGION*	58 176	995	10 023 786	72 614	8 873 497	85 897	23 487 246	219 540

*Interim data; to be corrected

FEMA Region 4 — ALABAMA — Potential Fallout



STATE OF ALABAMA -- FALLOUT RISK

Estimated 1985 Population: 3,959,145
 Land Area: 50,739 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Autauga						33 760	597
Baldwin						88 981	1 590
Barbour		25 494	884				
Bibb						16 836	625
Blount		37 155	643				
Bullock						10 624	625
Butler						22 263	779
Calhoun		127 200	611				
Chambers						40 557	596
Cherokee		19 540	553				
Chilton						31 425	695
Choctaw		16 995	909				
Clark						28 781	1 203
Clay		13 582	605				
Cleburne		12 925	561				
Coffee						40 578	680
Colbert	53 878	589					
Conecuh						15 464	854
Coosa						11 336	657
Covington						37 040	1 038
Crenshaw						13 832	611
Cullman		64 229	738				
Dale						45 314	561
Dallas						55 090	975
De Kalb		55 080	778				

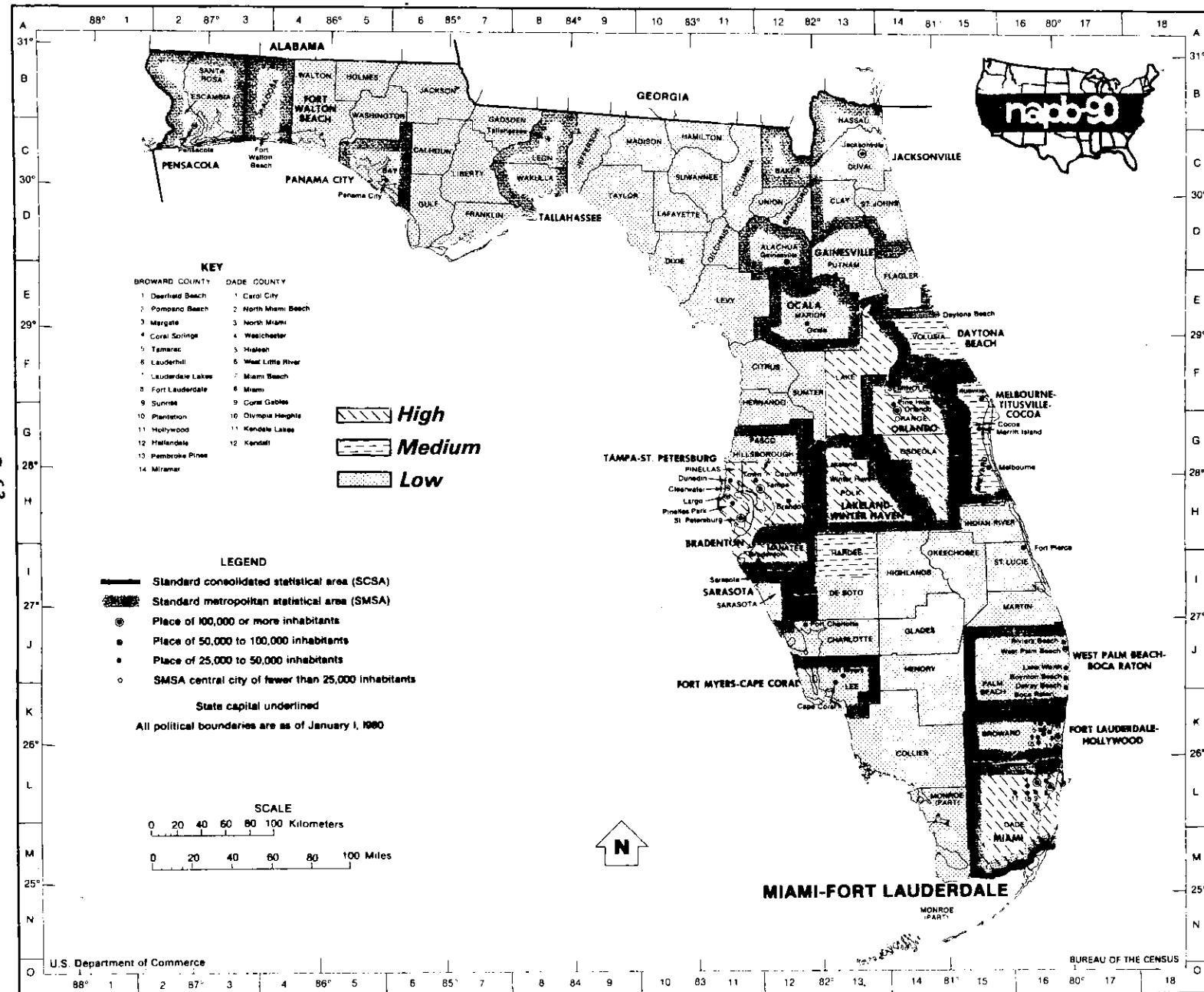
STATE OF ALABAMA (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Elmore							47 012	622
Escambia							37 656	951
Etowah					103 697	542		
Fayette					19 147	630		
Franklin		28 748	643					
Geneva							23 783	578
Greene					11 243	631		
Hale					15 065	661		
Henry							15 326	557
Houston							79 172	577
Jackson					51 402	1 069		
Jefferson					671 808	1 119		
Lamar		16 420	605					
Lauderdale		81 917	661					
Lawrence		31 671	693					
Lee							79 209	609
Limestone		47 639	559					
Lowndes							13 093	714
Macon							25 901	614
Madison		213 250	806					
Marengo					24 957	982		
Marion		31 414	743					
Marshall					69 502	567		
Mobile							328 158	1 238
Monroe							22 468	1 019

STATE OF ALABAMA (Continued)

COUNTY	VERY HIGH THREAT		HIGH THREAT		MEDIUM THREAT		LOW THREAT	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Montgomery						206 993	793
Morgan	94 796	575					
Perry			15 045	719			
Pickens	21 915	890					
Pike						28 106	672
Randolph			20 236	585			
Russell						48 550	634
St Clair			44 539	646			
Shelby			75 418	800			
Sumter			17 202	907			
Talladega			77 228	753			
Tallapoosa						39 107	701
Tuscaloosa			139 201	1 336			
Walker			68 882	803			
Washington						17 443	1 081
Wilcox						15 322	883
Winston	21 545	614					
TOTAL STATE	---	---	643 193	7 378	1 796 772	19 032	1 519 180	24 329

FEMA Region 4 — FLORIDA — Potential Fallout



S T A T E O F F L O R I D A - - F A L L O U T R I S K

Estimated 1985 Population: 11,883,346
 Land Area: 63,397 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Alachua						789 260	902
Baker						17 591	585
Bay						111 180	758
Bradford						23 983	293
Brevard				343 585	995		
Broward						1 112 075	1 211
Calhoun						9 556	568
Charlotte						79 404	690
Citrus						78 546	629
Clay						84 793	592
Collier						116 981	1 994
Columbia						39 947	797
Dade	1 726 021	1 995					
De Soto						21 295	636
Dixie						9 476	701
Duval						623 035	776
Escambia						260 730	661
Flagler						16 816	491
Franklin						8 343	545
Gadsden						43 693	518
Gilchrist						7 267	354
Glades						6 765	763
Gulf						11 349	559
Hamilton						9 342	517
Hardee				20 818	637		

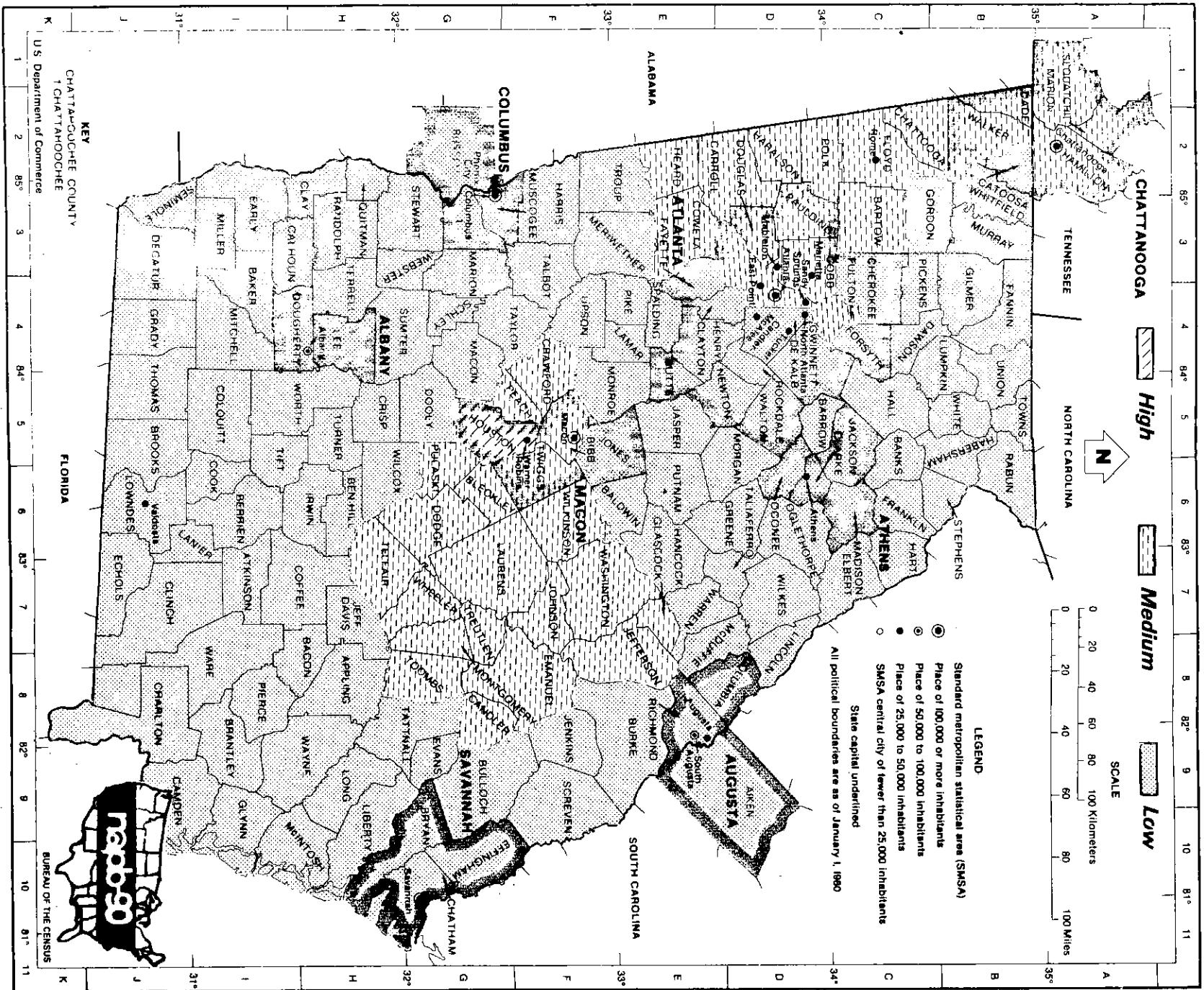
STATE OF FLORIDA (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Hendry						22 565	1 163
Hernando						74 901	477
Highlands						58 524	1 029
Hillsborough	743 771	1 053					
Holmes						15 934	488
Indian River						77 629	497
Jackson						40 768	942
Jefferson						11 658	609
Lafayette						4 332	545
Lake	127 239	954					
Lee						246 738	803
Leon						168 231	676
Levy						24 623	1 100
Liberty						4 576	837
Madison						15 443	710
Manatee	174 772	947					
Marion						163 799	1 610
Martin						82 856	555
Monroe						71 003	1 034
Nassau						38 569	649
Okaloosa						131 901	936
Okeechobee						25 812	771
Orange	547 930	910					
Osceola	74 576	1 350					
Palm Beach						721 030	1 993
Pasco						232 936	738
Pinellas	808 500	280					
Polk	363 740	1 823					
Putnam						59 098	733
St Johns						67 087	617

STATE OF FLORIDA (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK		
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	
St Lucie		117	109	581
Santa Rosa		65	097	1 024
Sarasota		246	395	573
Seminole		232	587	298
Sumter		29	162	561
Suwannee		25	644	690
Taylor		18	167	1 058
Union		11	562	246
Volusia		310 689	1 113			
Wakulla		12	889	601
Walton		25	509	1 066
Washington		16	144	590
TOTAL STATE	---	---	4 566 549	9 312	675 092	2 745	6 641	705	51 340

FEMA Region 4 – GEORGIA – *Potential Fallout*



S T A T E O F G E O R G I A -- F A L L O U T R I S K

Estimated 1985 Population: 5,929,233
 Land Area: 58,117 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Appling						16 441	510
Atkinson						6 254	344
Bacon						9 572	286
Baker						3 541	347
Baldwin						38 659	258
Banks						9 940	234
Barrow						24 768	163
Bartow						44 059	456
Ben Hill						17 067	254
Berrien						13 842	456
Bibb				158 476	253		
Bleckley				10 645	219		
Brantley						9 430	444
Brooks						15 299	491
Bryan						12 164	441
Bulloch						37 271	678
Burke						20 728	833
Butts						15 169	187
Calhoun						5 527	284
Camden						17 682	649
Candler				7 833	248		
Carroll				63 098	502		
Catoosa						38 746	163
Charlton						7 741	780
Chatham						214 908	444

STATE OF GEORGIA (Continued)

COUNTY	VERY HIGH RISK POPULATION	AREA	HIGH RISK POPULATION	AREA	MEDIUM RISK POPULATION	AREA	LOW RISK POPULATION	AREA
Chattahoochee						20 139	250
Chattooga				21 345	314		
Cherokee						65 533	424
Clarke						76 890	122
Clay						3 278	197
Clayton						165 686	148
Clinch						6 863	821
Cobb				368 393	343		
Coffee						28 818	602
Colquitt						36 484	556
Columbia						51 795	290
Cook						13 889	232
Coweta				43 886	444		
Crawford				7 087	328		
Crisp						20 258	275
Dade				11 389	176		
Dawson						5 873	210
Decatur						26 635	586
De Kalb						506 550	270
Dodge				16 747	504		
Dooly						10 616	397
Dougherty						103 630	330
Douglas				65 631	203		
Early						13 150	516
Echols						2 235	420
Effingham						21 091	482
Elbert						19 042	367
Emanuel				21 366	688		
Evans						8 504	186
Fannin						15 266	384

STATE OF GEORGIA (Continued)

COUNTY	VERY HIGH RISK POPULATION	AREA	HIGH RISK POPULATION	AREA	MEDIUM RISK POPULATION	AREA	LOW RISK POPULATION	AREA
Fayette						42 806	199
Floyd		78 516	519				
Forsyth						34 431	226
Franklin						15 569	264
Fulton		621 030	534				
Gilmer						11 822	427
Glascock						2 331	144
Glynn						60 350	412
Gordon						32 616	355
Grady						21 318	459
Greene						11 978	390
Gwinnett						246 112	435
Habersham						27 014	278
Hall						83 207	379
Hancock						9 302	469
Haralson		19 589	283				
Harris						16 380	464
Hart						19 220	230
Heard		6 750	292				
Henry						43 673	321
Houston	85 180	380					
Irwin						8 813	362
Jackson						27 158	342
Jasper						7 744	371
Jeff Davis						11 846	335
Jefferson	18 725	529					
Jenkins						8 421	353
Johnson	8 602	307					
Jones						18 579	394
Lamar						12 294	186
Lanier						5 644	194

STATE OF GEORGIA (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Laurens					38 253	816		
Lee							14 081	358
Liberty							41 837	517
Lincoln							6 892	196
Long							5 675	402
Lowndes							72 742	507
Lumpkin							12 036	287
McDuffie							19 633	256
McIntosh							8 025	425
Macon							14 188	404
Madison							19 508	285
Marion							5 384	366
Meriwether							20 661	506
Miller							6 795	284
Mitchell							21 841	512
Monroe							14 949	397
Montgomery					6 934	244		
Morgan							12 230	349
Murray							21 438	345
Muscogee							177 080	218
Newton							38 957	277
Oconee							14 648	186
Oglethorpe							9 543	442
Paulding					29 957	312		
Peach					19 200	151		
Pickens							13 303	232
Pierce							12 730	344
Pike							8 631	219
Polk					33 165	312		
Pulaski					8 959	249		

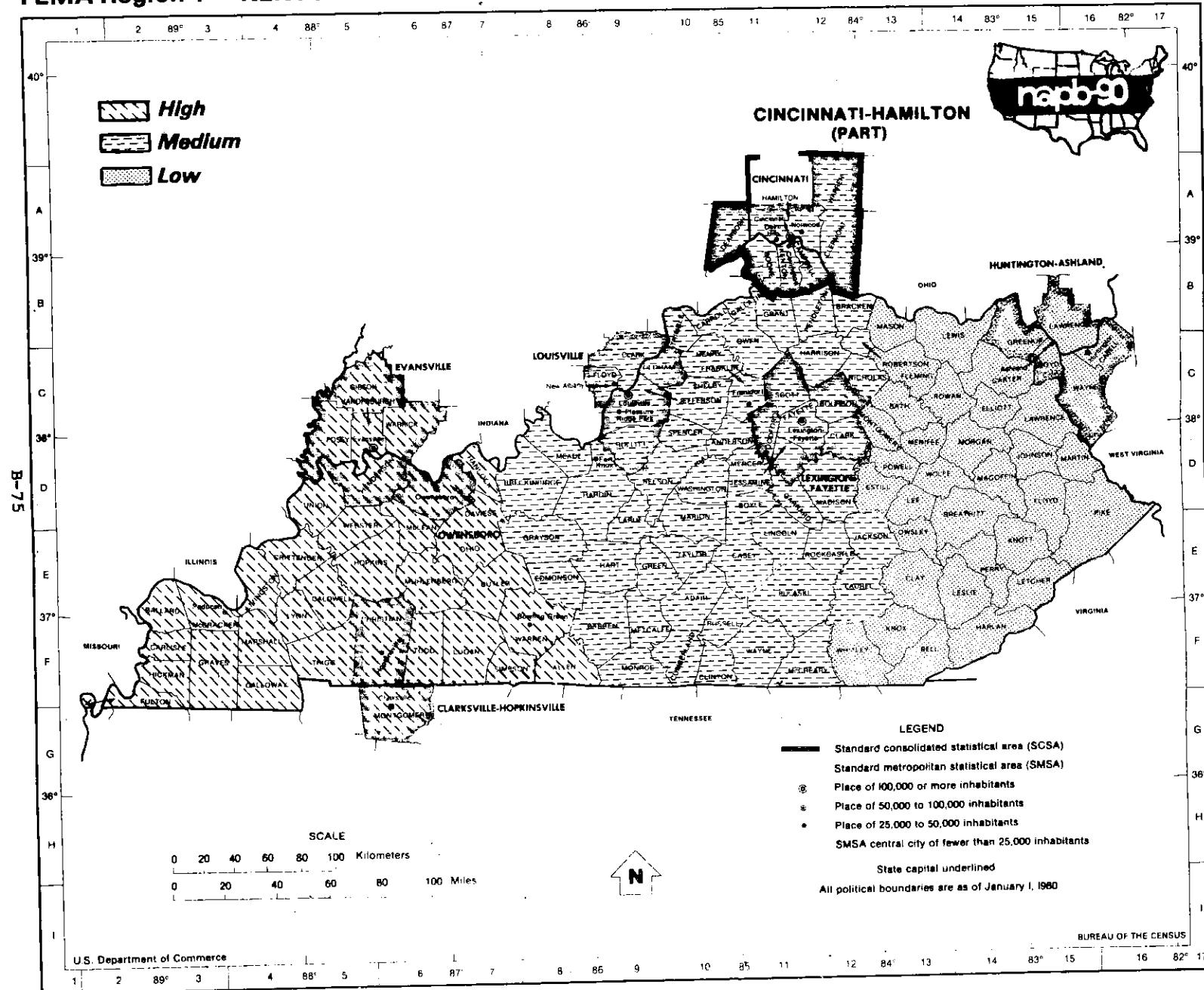
STATE OF GEORGIA (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Putnam							11 700	344
Quitman							2 156	146
Rabun							10 840	370
Randolph							9 381	481
Richmond							189 036	326
Rockdale							44 501	132
Schley							3 354	169
Screvan							14 396	655
Seminole							8 775	225
Spalding							51 453	199
Stephens							22 239	177
Stewart							5 862	452
Sumter							30 374	488
Talbot							6 496	395
Taliaferro							1 986	196
Tattnall							17 783	484
Taylor							8 082	382
Telfair							11 042	444
Terrell							11 943	337
Thomas							38 187	551
Tift							33 722	268
Toombs					23 633	371		
Towns							6 279	165
Treutlen					5 997	202		
Troup							53 248	415
Turner							9 643	289
Twiggs					9 744	362		
Union							10 583	320
Upson							26 591	326
Walker					55 155	446		

STATE OF GEORGIA (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK		
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	
Walton						32 390	330	
Ware						37 123	907	
Warren						6 439	286	
Washington		19 307	683					
Wayne						22 128	647	
Webster						2 077	210	
Wheeler		5 056	299					
White						11 205	242	
Whitfield						68 141	291	
Wilcox						7 559	382	
Wilkes						11 356	470	
Wilkinson		10 778	458					
Worth						18 259	575	
TOTAL STATE	---	---	85 180	380	1 859	305	12 047	3 984 738	45 690

FEMA Region 4 – KENTUCKY – *Potential Fallout*



S T A T E O F K E N T U C K Y - - F A L L O U T R I S K

Estimated 1985 Population: 3,730,146
 Land Area: 39,639 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Adair				15 857	407		
Allen	14 370	338					
Anderson							
Ballard	8 186	254		13 522	204		
Barren				34 692	482		
Bath							
Bell						10 263	278
Boone						34 201	361
Bourbon				51 553	246		
Boyd				19 147	292		
Boyle						54 575	161
Bracken				25 106	182		
Breathitt				7 555	203		
Breckinridge						16 453	495
Bullitt				16 566	565		
					45 100	300		
Butler	11 958	431					
Caldwell	13 265	347					
Calloway	30 551	386					
Campbell				80 896	152		
Carlisle	5 262	191					
Carroll				9 850	130		
Carter						25 814	407
Casey				15 293	445		
Christian	64 360	722					
Clark				29 442	255		

STATE OF KENTUCKY (Continued)

COUNTY	VERY HIGH RISK POPULATION	AREA	HIGH RISK POPULATION	AREA	MEDIUM RISK POPULATION	AREA	LOW RISK POPULATION	AREA
Clay						23 867	471
Clinton				9 984	196		
Crittenden		8 896	360				
Cumberland				7 334	304		
Daviess		88 834	463				
Edmonson				11 567	302		
Elliott				6 923	234		
Estill				15 107	256		
Fayette				211 628	285		
Fleming						12 524	351
Floyd						51 295	393
Franklin				44 192	212		
Fulton		8 234	211				
Gallatin				4 962	99		
Garrard				11 397	232		
Grant				14 477	259		
Graves		37 712	557				
Grayson				22 631	493		
Green				10 950	289		
Greenup						38 515	347
Hancock		8 242	189				
Hardin				90 545	629		
Harlan						42 139	468
Harrison				15 678	310		
Hart				17 009	412		
Henderson		42 474	438				
Henry				13 467	291		
Hickman		5 618	245				
Hopkins		46 424	552				
Jackson				12 586	346		

STATE OF KENTUCKY (Continued)

COUNTY	VERY HIGH RISK POPULATION	AREA	HIGH RISK POPULATION	AREA	MEDIUM RISK POPULATION	AREA	LOW RISK POPULATION	AREA
Jefferson				682 179	386		
Jessamine				28 497	175		
Johnson						25 895	264
Kenton						136 391	163
Knott				18 395	352		
Knox						30 205	358
Larue				12 018	263		
Laurel				42 251	434		
Lawrence						15 007	420
Lee						7 781	211
Leslie						15 407	402
Letcher						30 977	339
Lewis						14 458	484
Lincoln				19 180	332		
Livingston	9 131	312					
Logan	26 045	556					
Lyon	6 425	209					
McCracken	61 367	251					
McCreary				16 306	427		
McLean	9 948	256					
Madison				55 644	443		
Magoffin						14 251	310
Marion				17 699	347		
Marshall	25 976	304					
Martin						1 063	231
Mason						17 091	241
Meade				22 789	307		
Menifee						5 353	203
Mercer				19 405	250		
Metcalfe				10 359	291		

STATE OF KENTUCKY (Continued)

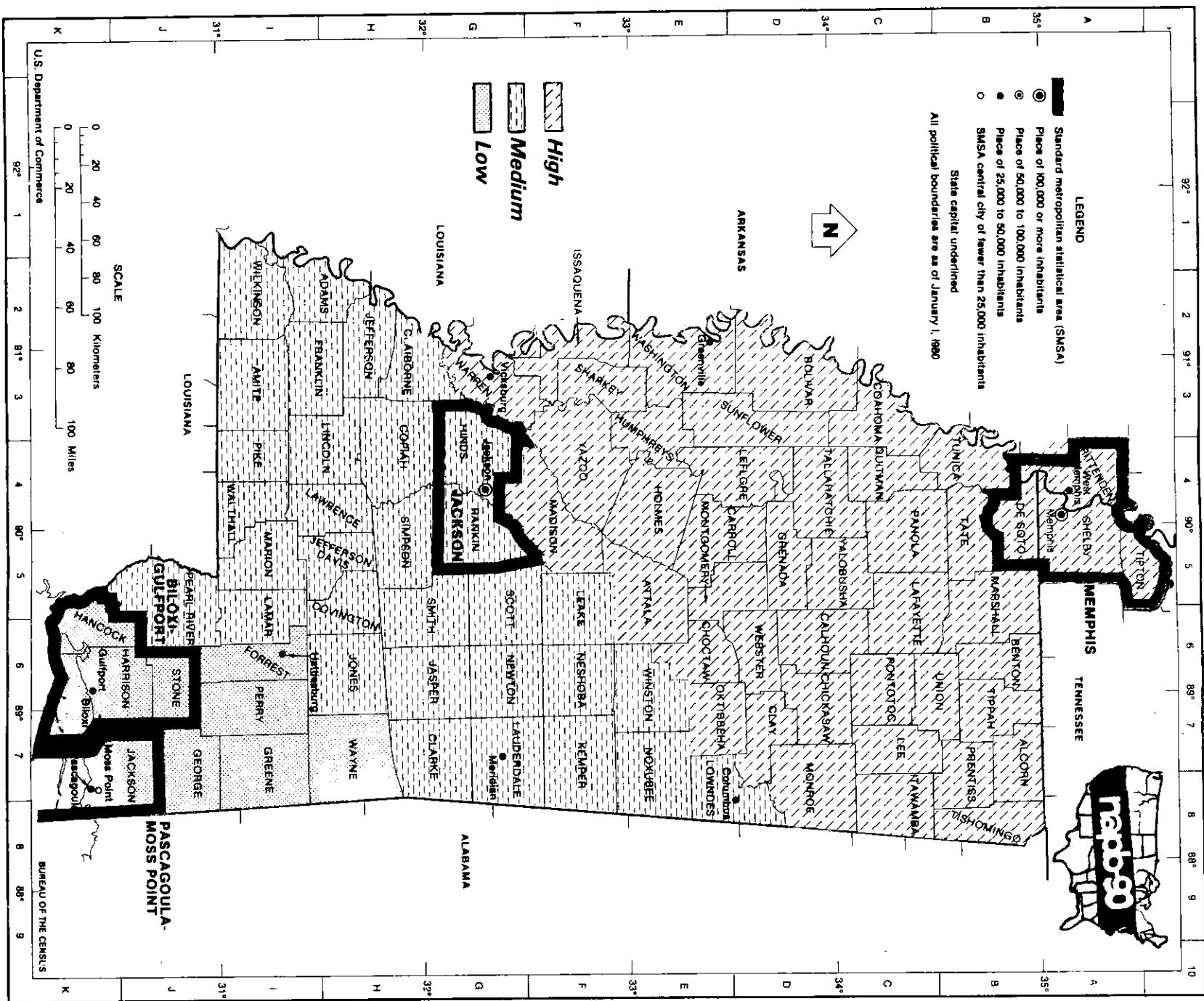
COUNTY	VERY HIGH RISK POPULATION	AREA	HIGH RISK POPULATION	AREA	MEDIUM RISK POPULATION	AREA	LOW RISK POPULATION	AREA
Monroe				12 618	331		
Montgomery						20 410	199
Morgan						12 122	382
Muhlenberg		31 696	478				
Nelson				28 923	424		
Nicholas				7 330	197		
Ohio		21 875	596				
Oldham				30 519	190		
Owen				9 217	354		
Owsley						5 641	198
Pendleton				10 767	281		
Perry						35 419	341
Pike						83 875	785
Powell						11 907	180
Pulaski				49 129	660		
Robertson				2 383	100		
Rockcastle				14 664	318		
Rowan						19 043	282
Russell				15 141	250		
Scott				21 971	286		
Shelby				24 243	385		
Simpson		14 936	236				
Spencer				6 148	192		
Taylor				22 162	270		
Todd		10 649	377				
Trigg		9 386	421				
Trimble				6 321	148		
Union		17 807	341				
Warren		82 907	547				
Washington				10 291	301		

STATE OF KENTUCKY (Continued)

COUNTY	VERY HIGH THREAT POPULATION	AREA	HIGH THREAT POPULATION	AREA	MEDIUM THREAT POPULATION	AREA	LOW THREAT POPULATION	AREA
Wayne				17 759	446		
Webster		14 730	336				
Whitley						35 619	443
Wolfe						7 152	223
Woodford				18 845	192		
TOTAL STATE	---	---	737 264	10 904	2 138 169	18 344	854 713	10 391

FEMA Region 4 — MISSISSIPPI — Potential Fallout

Map 90



S T A T E O F M I S S I S S I P P I -- F A L L O U T R I S K

Estimated 1985 Population: 2,617,133
 Land Area: 47,174 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Adams				39 119		456	
Alcorn	32 183	401					
Amite							
Attala	18 901	737					
Benton	8 126	407					
Bolivar	45 246	892					
Calhoun	15 196	573					
Carroll	9 173	634					
Chickasaw	17 923	503					
Choctaw	8 542	420					
Claiborne				12 621		494	
Clarke				16 823		692	
Clay	22 053	415					
Coahoma	35 424	559					
Copiah				25 744		779	
Covington				15 888		416	
De Soto	58 091	483					
Forrest						70 812	469
Franklin				8 373	566		
George						16 044	483
Greene						9 382	718
Grenada	21 543	421					
Hancock							
Harrison						29 671	478
Hinds				261 467	875	171 484	581

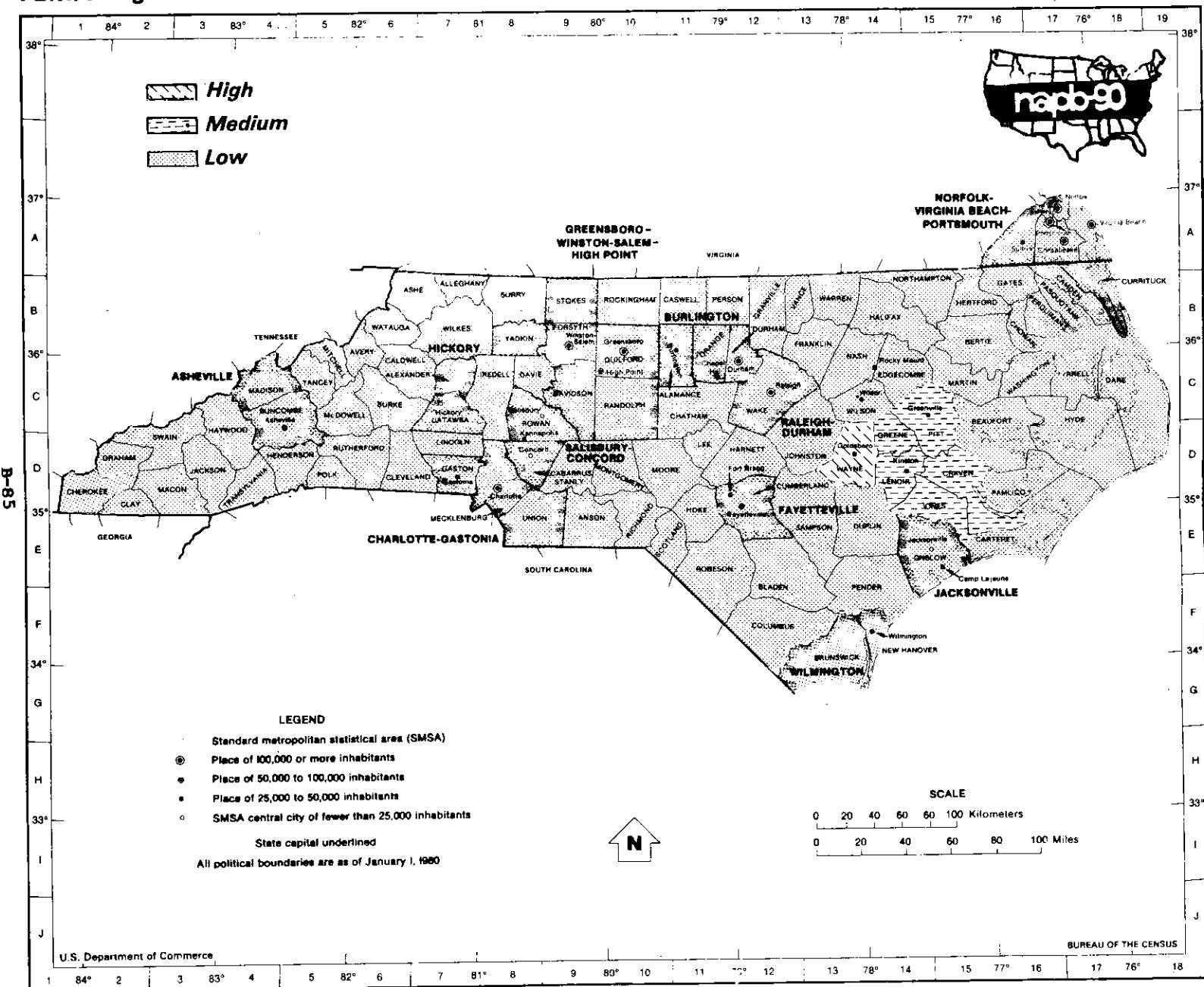
STATE OF MISSISSIPPI (Continued)

COUNTY	VERY HIGH RISK POPULATION	AREA	HIGH RISK POPULATION	AREA	MEDIUM RISK POPULATION	AREA	LOW RISK POPULATION	AREA
Holmes		23 784	759				
Humphreys						13 934	430
Issaquena		2 147	406				
Itawamba		20 299	541				
Jackson						124 917	731
Jasper				17 173	678		
Jefferson				9 793	523		
Jefferson Davis				14 104	409		
Jones				64 507	695		
Kemper				10 373	766		
LaFayette		32 522	609				
Lamar				26 768	499		
Lauderdale				80 005	705		
Lawrence				13 144	435		
Leake				18 683	584		
Lee		61 285	451				
LeFlore		42 369	605				
Lincoln				31 099	586		
Lowndes				61 314	517		
Madison		45 724	717				
Marion				27 571	548		
Marshall		32 405	709				
Monroe		36 628	772				
Montgomery		12 660	408				
Neshoba				24 674	571		
Newton						20 288	580
Noxubee						12 537	698
Oktibbeha		38 129	459				
Panola		29 785	695				
Pearl River				38 167	819		

STATE OF MISSISSIPPI (Continued)

COUNTY	VERY HIGH RISK POPULATION	AREA	HIGH RISK POPULATION	AREA	MEDIUM RISK POPULATION	AREA	LOW RISK POPULATION	AREA
Perry						10 646	651
Pike				36 699	410		
Pontotoc		21 744	499				
Prentiss		24 682	417				
Quitman		11 334	406				
Rankin				80 192	782		
Scott				25 256	610		
Sharkey		8 076	435				
Simpson				24 762	591		
Smith				14 554	635		
Stone						10 110	446
Sunflower		37 634	707				
Tallahatchie		16 124	651				
Tate		21 311	406				
Tippah		18 985	458				
Tishomingo						17 338	434
Tunica		9 299	460				
Union		21 595	417				
Walthall				12 870	404		
Warren		51 872	597				
Washington		72 533	733				
Wayne						20 152	813
Webster		10 196	424				
Wilkinson				10 484	678		
Winston				18 567	610		
Yalobusha		13 387	478				
Yazoo		26 826	933				
TOTAL STATE	---	---	1 035 736	21 597	1 086 907	19 343	494 490	6 234

FEMA Region 4 – NORTH CAROLINA – *Potential Fallout*



STATE OF NORTH CAROLINA -- FALLOUT RISK

Estimated 1985 Population: 6,233,774
 Land Area: 48,843 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Alamance		102 865	433
Alexander		26 671	259
Alleghany		9 941	234
Anson		26 266	533
Ashe		23 263	426
Avery		15 040	247
Beaufort		43 217	826
Bertie		21 491	701
Bladen		30 794	879
Brunswick		45 643	861
Buncombe		166 717	659
Burke		75 193	505
Cabarrus		93 522	364
Caldwell		68 745	471
Camden		5 866	241
Carteret		48 181	525
Caswell		22 441	427
Catawba		112 583	396
Chatham		35 680	708
Cherokee		20 231	452
Chowan		12 995	181
Clay		7 093	214
Cleveland		84 762	468
Columbus		51 937	939
Craven		77 821	702		

STATE OF NORTH CAROLINA (Continued)

COUNTY	VERY HIGH RISK POPULATION	AREA	HIGH RISK POPULATION	AREA	MEDIUM RISK POPULATION	AREA	LOW RISK POPULATION	AREA
Cumberland		252 353	657
Currituck		13 318	256
Dare		17 107	391
Davidson		118 693	548
Davie		27 416	267
Duplin		41 650	819
Durham		160 837	298
Edgecombe		58 790	506
Forsyth		258 622	412
Franklin		32 305	494
Gaston		170 614	357
Gates		9 357	338
Graham		7 104	289
Granville		36 884	534
Greene		16 464	266		
Guilford		327 323	651
Halifax		56 258	724
Harnett		62 366	601
Haywood		47 835	555
Henderson		66 501	375
Hertford		24 076	356
Hoke		22 566	391
Hyde		5 925	624
Iredell		87 260	574
Jackson		27 318	490
Johnston		76 426	795
Jones		9 806	470		
Lee		40 039	259
Lenoir		61 276	402		
Lincoln		45 086	298

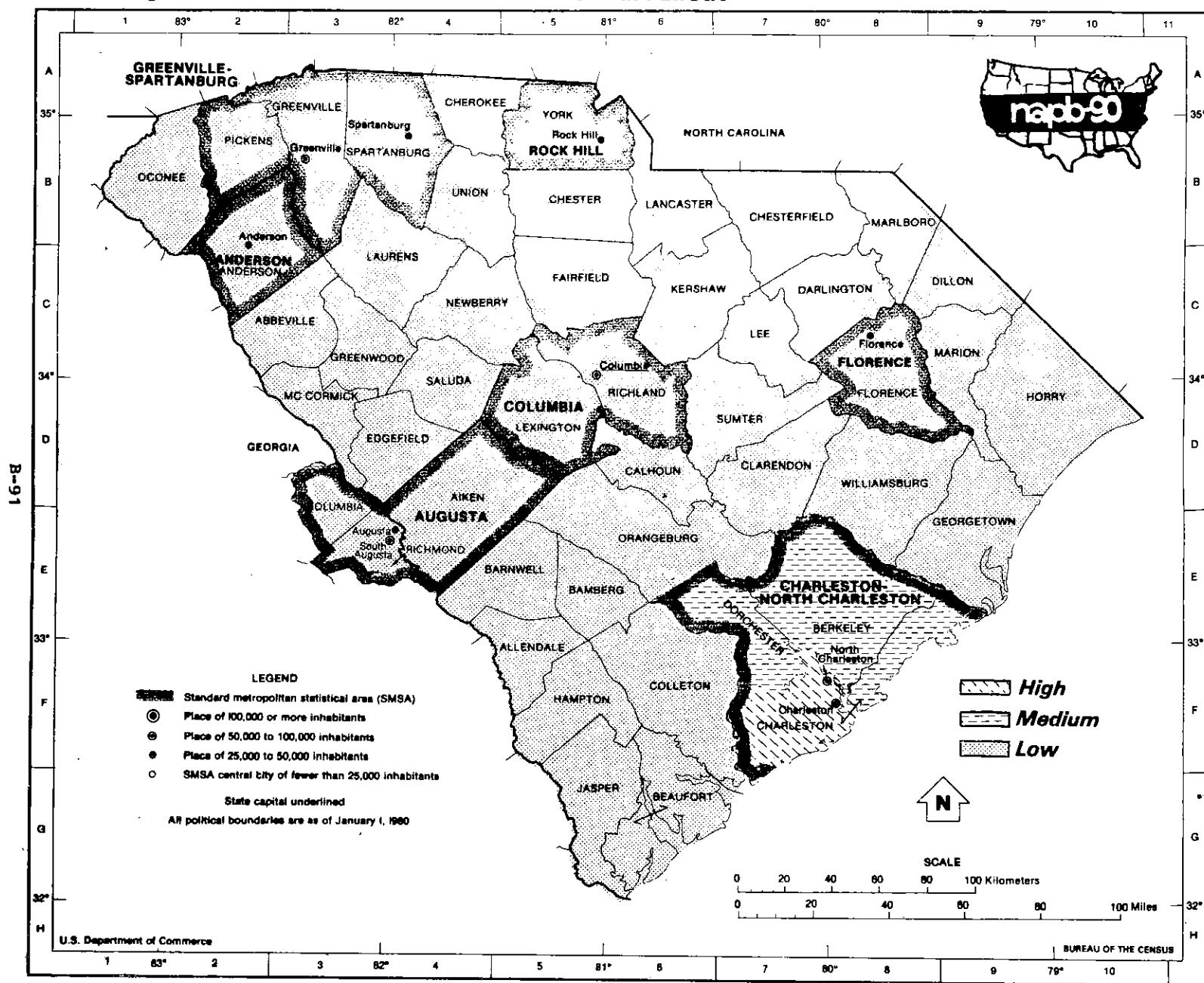
STATE OF NORTH CAROLINA (Continued)

COUNTY	VERY HIGH RISK POPULATION	AREA	HIGH RISK POPULATION	AREA	MEDIUM RISK POPULATION	AREA	LOW RISK POPULATION	AREA
McDowell		36 454	437
Macon		23 466	517
Madison		17 250	451
Martin		27 437	461
Mecklenburg		439 986	528
Mitchell		14 258	222
Montgomery		23 665	490
Moore		55 254	701
Nash		70 931	540
New Hanover		112 147	185
Northhampton		22 485	538
Onslow		120 039	763
Orange		81 875	400
Pamlico		10 925	341
Pasquotank		29 502	228
Pender		24 268	875
Perquimans		9 913	246
Person		30 316	398
Pitt		96 024	656		
Polk		14 758	238
Randolph		97 642	789
Richmond		45 644	477
Robeson		106 472	949
Rockingham		85 801	569
Rowan		102 667	519
Rutherford		56 501	568
Sampson		50 707	947
Scotland		34 149	319
Stanly		50 203	396
Stokes		35 319	452

STATE OF NORTH CAROLINA (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Surry						60 500	539
Swain						10 818	526
Transylvania						25 249	378
Tyrrell						4 130	407
Union						77 802	639
Vance						38 320	249
Wake						346 147	854
Warren						16 236	427
Washington						14 473	332
Watauga						34 273	314
Wayne	98 361	554					
Wilkes						60 948	752
Wilson						64 997	374
Yadkin						29 498	336
Yancey						15 431	314
TOTAL STATE	---	---	98 361	554	261 391	2 496	5 874 022	45 793

FEMA Region 4 — SOUTH CAROLINA — Potential Fallout



STATE OF SOUTH CAROLINA -- FALLOUT RISK

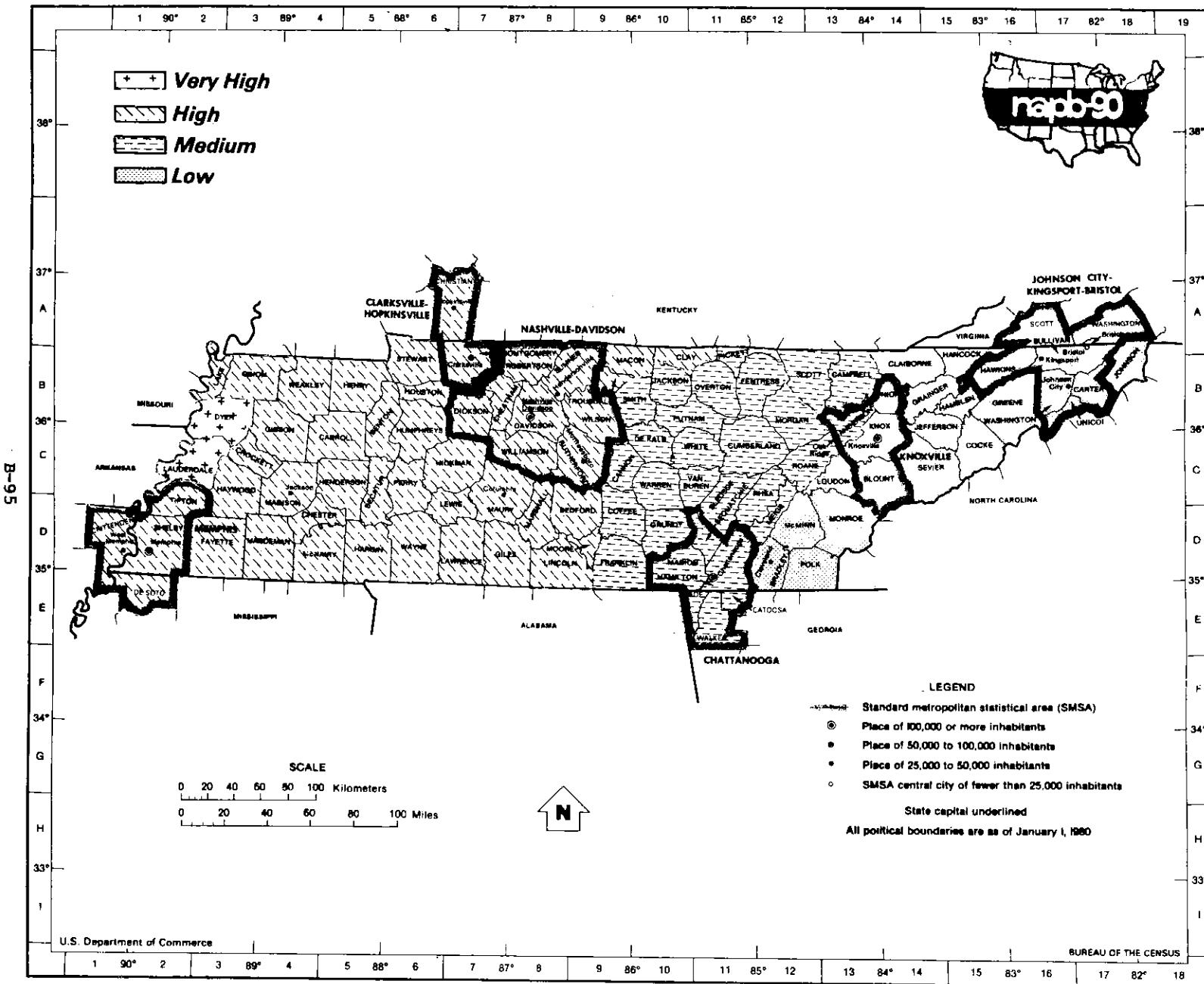
Estimated 1985 Population: 3,343,422
 Land Area: 30,207 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Abbeville						22 919	508
Aiken						113 409	1 092
Allendale						10 904	413
Anderson						139 797	718
Bamberg						18 097	395
Barnwell						20 308	558
Beaufort						81 853	579
Berkeley				117 319	1 108		
Calhoun							
Charleston	291 814	938				11 431	380
Cherokee						41 186	396
Chester						30 992	580
Chesterfield						38 454	802
Clarendon						28 112	602
Colleton						33 866	1 052
Darlington						64 933	563
Dillon						32 316	406
Dorchester		73 846	575				
Edgefield						17 809	490
Fairfield						20 805	685
Florence						114 936	804
Georgetown						47 533	822
Greenville						303 866	795
Greenwood						60 352	451
Hampton						18 899	561

STATE OF SOUTH CAROLINA (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Horry						126 279	1 143
Jasper						14 369	655
Kershaw						42 124	723
Lancaster						55 843	552
Laurens						53 481	712
Lee						18 510	411
Lexington						156 949	707
McCormick						7 183	350
Marion						34 924	493
Marlboro						32 459	483
Newberry						32 044	634
Oconee						51 780	629
Orangeburg						86 706	1 112
Pickens						85 403	499
Richland						282 019	762
Saluda						17 017	456
Spartanburg						209 163	814
Sumter						94 839	665
Union						30 826	515
Williamsburg						39 284	934
York						116 464	685
TOTAL STATE	---	---	291 814	938	191 165	1 683	2 860 443	27 586

FEMA Region 4 – TENNESSEE – *Potential Fallout*



STATE OF TENNESSEE -- FALLOUT RISK

Estimated 1985 Population: 4,746,516
 Land Area: 40,930 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Anderson				69 607	339		
Bedford	28 701	475					
Benton	15 088	392					
Bledsoe			9 278	407			
Blount						81 926	558
Bradley						70 601	327
Campbell			35 490	479			
Cannon			10 725	266			
Carroll	28 302	600					
Carter						51 658	341
Cheatham	23 557	303					
Chester	12 837	289					
Claiborne						26 644	432
Clay	8 061	227					
Cocke						29 318	432
Coffee			40 569	429			
Crockett	13 895	266					
Cumberland			31 190	682			
Davidson	487 241	501					
Decatur	10 958	330					
DeKalb			13 881	291			
Dickson	31 624	491					
Dyer	33 920	520						
Fayette	24 623	705					
Fentress			15 603	498			

STATE OF TENNESSEE (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Franklin					33 382	543		
Gibson			48 338	602				
Giles			24 789	610				
Grainger							17 155	273
Greene							56 054	619
Grundy					14 085	361		
Hamblen							59 098	156
Hamilton					282 988	539		
Hancock								6 751
Hardeman			23 322	670				
Hardin			22 314	578				
Hawkins							45 137	486
Haywood			20 547	534				
Henderson			21 854	520				
Henry			29 023	560				
Hickman			15 927	610				
Houston			7 011	200				
Humphreys			15 702	527				
Jackson					9 146	308		
Jefferson							35 027	266
Johnson							14 302	297
Knox							331 840	506
Lake			8 310	168				
Lauderdale	24 256	475						
Lawrence			34 625	617				
Lewis			10 580	282				
Lincoln			26 229	571				
Loudon							30 719	235
McMinn							43 710	429
McNairy			23 337	562				

STATE OF TENNESSEE (Continued)

COUNTY	VERY HIGH RISK POPULATION	AREA	HIGH RISK POPULATION	AREA	MEDIUM RISK POPULATION	AREA	LOW RISK POPULATION	AREA
Macon		15 667	307				
Madison		76 858	558				
Marion				24 502	512		
Marshall		20 095	376				
Maury		51 863	616				
Meigs				7 787	189		
Monroe						30 048	648
Montgomery		88 788	539				
Moore		4 907	129				
Morgan				17 290	523		
Obion		32 980	550				
Overton				18 095	433		
Perry		6 427	412				
Pickett				4 510	159		
Polk						13 605	437
Putnam				50 464	399		
Rhea				24 819	309		
Roane				49 436	357		
Robertson		38 717	476				
Rutherford		97 308	605				
Scott				20 635	528		
Sequatchie				8 618	266		
Sevier						47 229	590
Shelby		796 450	772				
Smith				14 564	313		
Stewart		9 154	454				
Sullivan						145 705	415
Sumner		92 025	529				
Tipton		35 021	454				
Trousdale		5 488	114				

STATE OF TENNESSEE (Continued)

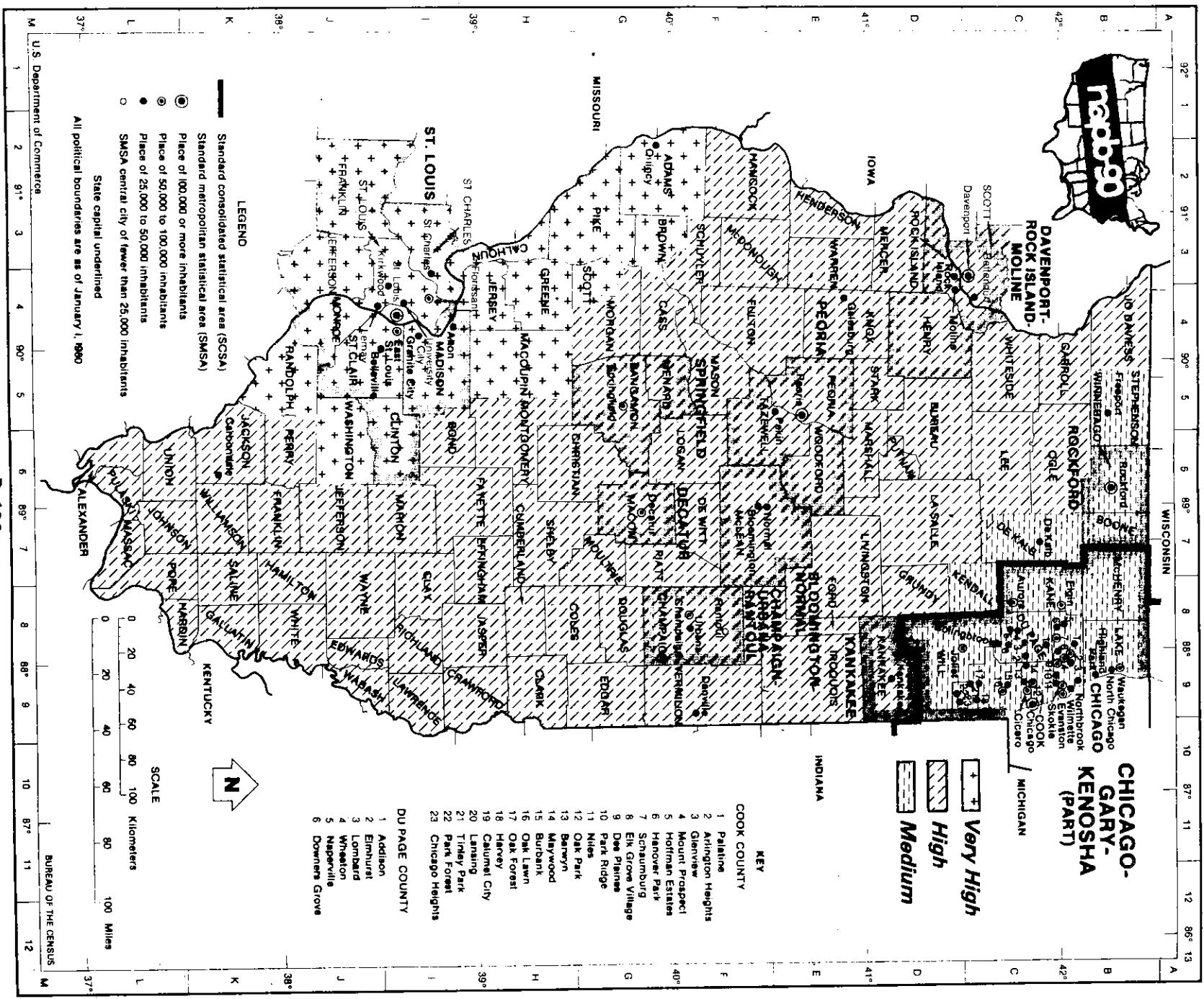
COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Unicoi						16 911	186
Union						12 358	218
Van Buren				4 782	273		
Warren				33 436	431		
Washington						92 699	326
Wayne	14 115	734					
Weakley	33 395	581					
White			19 814	373			
Williamson	68 284	584					
Wilson	61 352	571					
TOTAL STATE	58 176	995	2 565 689	21 551	864 696	10 207	1 257 955	8 177

F E M A R E G I O N V - - F A L L O U T R I S K S U M M A R Y

Estimated 1985 Population: 45,687,087
 Land Area: 323,545 square miles

STATE	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Illinois	812 787	7 676	3 000 057	41 187	7 744 412	6 723	---	---
Indiana	---	---	1 873 950	18 787	3 625 686	17 176	---	---
Michigan	---	---	128 678	5 140	8 902 100	51 879	---	---
Minnesota	489 329	32 604	3 691 902	46 943	---	---	---	---
Ohio	---	---	---	---	3 714 442	13 639	6 924 191	27 367
Wisconsin	---	---	253 343	7 882	4 526 210	46 542	---	---
TOTAL REGION V	1 302 116	40 280	8 947 930	119 939	28 512 850	135 959	6 924 191	27 367

FEMA Region 5 – ILLINOIS – *Potential Fallout*



S T A T E O F I L L I N O I S -- F A L L O U T R I S K

Estimated 1985 Population: 11,557,256
 Land Area: 55,586 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Adams	70 543	852						
Alexander		11 799	236				
Bond		16 041	377				
Boone				28 123	282		
Brown	5 480	306						
Bureau		37 832	869				
Calhoun	5 833	250						
Carroll		17 942	444				
Cass		14 387	374				
Champaign		170 697	998				
Christian		36 273	710				
Clark		16 728	505				
Clay		15 596	469				
Clinton	33 632	472						
Coles		52 388	509				
Cook				5 274 484	958		
Crawford		20 950	446				
Cumberland		10 918	346				
DeKalb				73 019	634		
DeWitt		17 938	397				
Douglas		19 563	417				
Du Page				711 968	337		
Edgar		21 269	623				
Edwards		8 235	223				
Effingham		31 633	478				

STATE OF ILLINOIS (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Fayette		22 339	709				
Ford		14 938	486				
Franklin		43 111	414				
Fulton		40 582	871				
Gallatin		7 644	325				
Green	15 939	543						
Grundy		31 503	423				
Hamilton		9 224	436				
Hancock		23 650	795				
Hardin		5 474	181				
Henderson		9 159	373				
Henry		53 526	824				
Iriquois		32 535	1 118				
Jackson		61 293	590				
Jasper		11 497	496				
Jefferson		38 604	570				
Jersey	20 256	373						
Jo Daviess		23 263	603				
Johnson		10 149	346				
Kane				298 217	524		
Kankakee		99 413	678				
Kendall				36 647	322		
Knox		57 954	720				
Lake				465 841	454		
La Salle		108 455	1 139				
Lawrence		18 424	374				
Lee		33 826	725				
Livingston		40 686	1 046				
Logan		30 475	619				
McDonough		36 265	590				

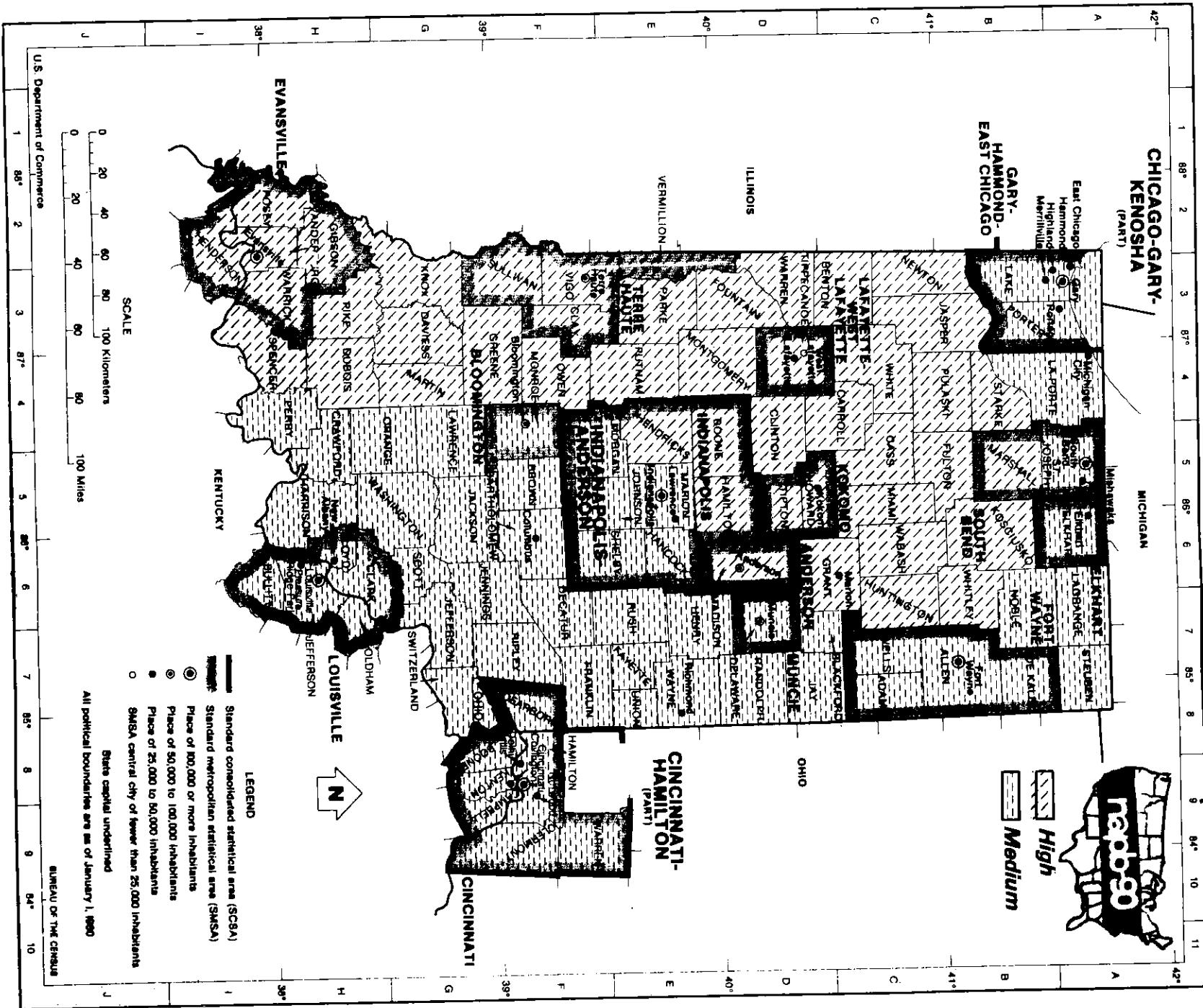
STATE OF ILLINOIS (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
McHenry						158	605
McLean		152	292	1	185	607	
Macon		127	873		581		
Macoupin	49	374	865					
Madison	247	422	728					
Marion		44	925	573			
Marshall		13	787	388			
Mason		17	943	536			
Massac		14	850	241			
Menard		11	674	315			
Mercer		19	385	559			
Monroe	21	041	388					
Montgomery		32	096	705			
Morgan		37	146	568			
Moultrie		14	598	325			
Ogle		45	687	759			
Peoria		191	238	620			
Perry		22	442	442			
Piatt		16	400	439			
Pike	18	603	830					
Pope		4	345	374			
Pulaski		8	556	203			
Putnam		6	199	160			
Randolph	35	699	583					
Richland		18	653	360			
Rock Island		164	903	423			
St Clair	267	819	672					
Saline		28	808	385			
Sangamon		179	013	806			
Schuylerville		8	028	436			

STATE OF ILLINOIS (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Scott	5 978	251						
Shelby		23 698	747				
Stark		6 878	288				
Stephenson				49 795	564		
Tazewell		128 870	650				
Union		18 287	414				
Vermilion		92 625	900				
Wabash		14 342	224				
Warren		21 014	543				
Washington	15 168	563						
Wayne		18 799	715				
White		18 279	497				
Whiteside				63 783	682		
Will				334 477	844		
Williamson		59 035	427				
Winnebago				249 453	515		
Woodford		33 211	527				
TOTAL STATE	812 787	7 676	3 000 057	41 189	7 744 412	6 723	---	---

FEMA Region 5 – INDIANA – Potential Fallout



STATE OF INDIANA -- FALLOUT RISK

Estimated 1985 Population: 5,499,636
 Land Area: 35,963 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Adams					29 889	340		
Allen					287 909	659		
Bartholomew					64 218	409		
Benton		10 004	407					
Blackford					15 552	166		
Boone		39 948	424					
Brown					12 489	312		
Carroll		19 420	372					
Cass		39 602	414					
Clark					89 700	376		
Clay		24 189	360					
Clinton		31 984	405					
Crawford					9 847	307		
Daviess		29 889	432					
Dearborn					37 278	307		
Decatur					24 060	373		
De Kalb					32 482	364		
Delaware					122 300	392		
Dubois		35 783	429					
Elkhart					143 394	466		
Fayette					27 786	215		
Floyd					63 461	150		
Fountain		18 929	398					
Franklin					21 208	385		
Fulton		18 858	369					

STATE OF INDIANA (Continued)

COUNTY	VERY HIGH RISK POPULATION	AREA	HIGH RISK POPULATION	AREA	MEDIUM RISK POPULATION	AREA	LOW RISK POPULATION	AREA
Gibson		34 621	490				
Grant		78 305	415				
Greene		30 483	546				
Hamilton		90 684	398				
Hancock				44 449	307		
Harrison				28 777	486		
Hendricks		73 600	409				
Henry				49 438	395		
Howard		84 640	293				
Huntington		34 915	366				
Jackson				37 924	514		
Jasper		26 785	561				
Jay				21 544	384		
Jefferson				30 439	363		
Jennings				22 737	378		
Johnson				82 426	321		
Knox		43 254	520				
Kosciusko		62 293	540				
LaGrange				28 018	380		
Lake				500 016	501		
La Porte				106 674	600		
Lawrence				41 069	452		
Madison		132 788	453				
Marion				777 116	396		
Marshall		40 965	444				
Martin		10 811	339				
Miami		36 512	369				
Monroe				101 351	385		
Montgomery		35 828	505				
Morgan				53 958	409		

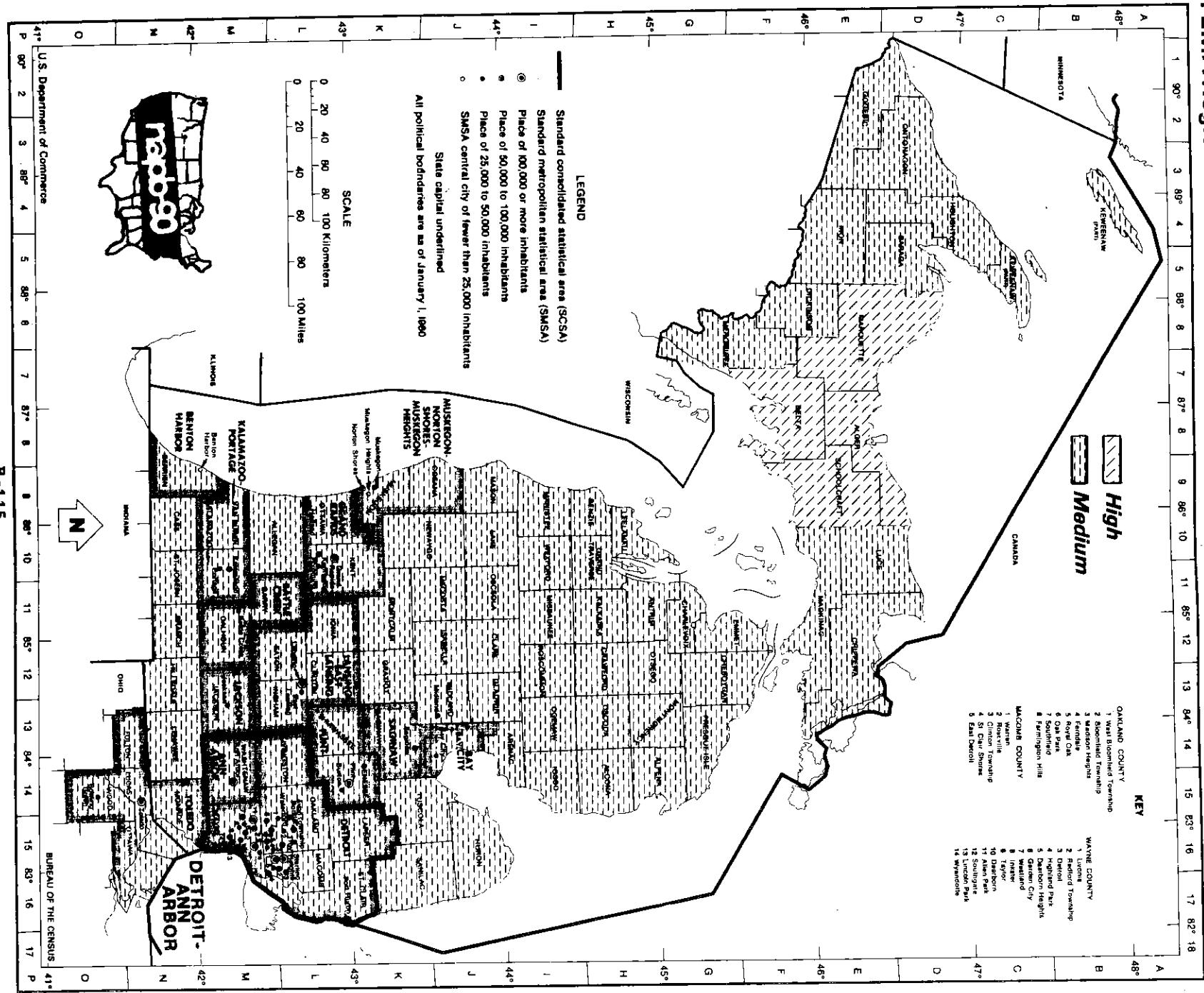
STATE OF INDIANA (Continued)

COUNTY	VERY HIGH RISK POPULATION	AREA	HIGH RISK POPULATION	AREA	MEDIUM RISK POPULATION	AREA	LOW RISK POPULATION	AREA
Newton		14 572	401				
Noble				36 347	413		
Ohio				5 153	87		
Orange				18 661	408		
Owen		16 529	386				
Parke		16 845	444				
Perry		19 057	381				
Pike		13 173	341				
Porter				126 246	419		
Posey		26 129	410				
Pulaski		13 458	435				
Putnam		30 660	482				
Randolph				28 234	454		
Ripley				25 250	447		
Rush				18 766	408		
St Joseph				239 263	459		
Scott				20 313	192		
Shelby				40 382	412		
Spencer		21 255	400				
Starke		20 993	309				
Steuben				25 018	308		
Sullivan		20 798	452				
Switzerland				7 626	224		
Tippecanoe		124 393	502				
Tipton		15 688	261				
Union				6 746	163		
Vanderburgh		168 196	263				
Vermillion		17 904	260				
Vigo		109 571	405				
Wabash		34 816	398				

STATE OF INDIANA (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Warren		8 969	366				
Warrick		45 743	391				
Washington		22 315	516		
Wayne		72 979	404		
Wells		24 878	370		
White		23 599	506				
Whitley		26 512	336				
TOTAL STATE	---	---	1 873 950	18 787	3 625 686	17 176	---	---

FEMA Region 5 – MICHIGAN – *Potential Fallout*



S T A T E O F M I C H I G A N -- F A L L O U T R I S K

Estimated 1985 Population: 9,030,778
Land Area: 57,019 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Alcona				9 865			
Alger		8 715	912				
Allegan				84 857			
Alpena				31 164			
Antrim				16 919			
Arenac				15 260			
Baraga				8 276			
Barry				46 620			
Bay				116 484			
Benzie				11 105			
Berrien				160 914			
Branch				38 324			
Calhoun				136 813			
Cass				47 369			
Charlevoix				19 648			
Cheboygan				20 952			
Chippewa				28 740	1 590		
Clare				24 955			
Clinton				55 108			
Crawford				9 904			
Delta	39 551	1 173					
Dickinson				25 983			
Eaton				89 510			
Emmet				23 747			
Genesee				430 014			
					642			

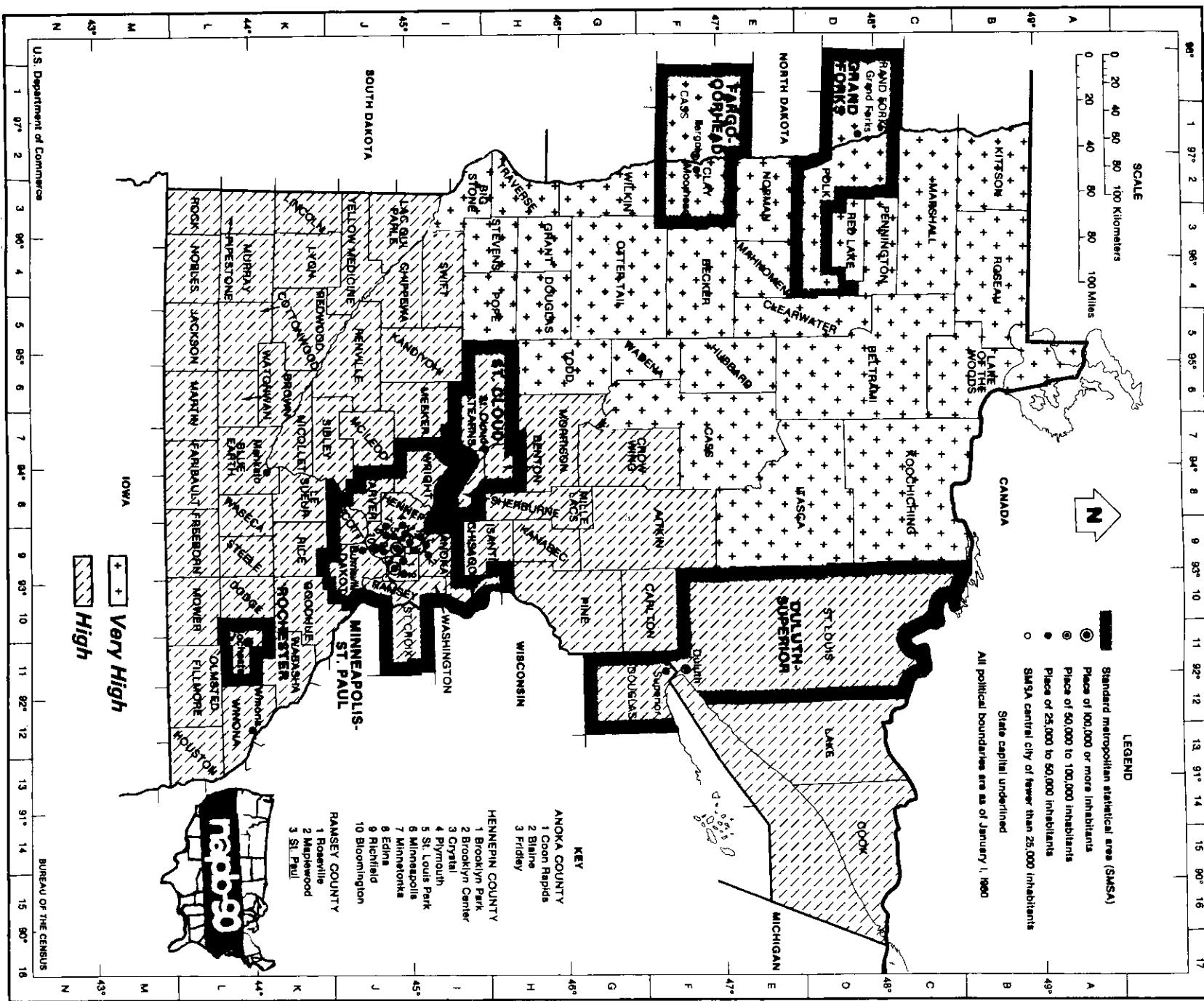
STATE OF MICHIGAN (Continued)

COUNTY	VERY HIGH RISK POPULATION	AREA	HIGH RISK POPULATION	AREA	MEDIUM RISK POPULATION	AREA	LOW RISK POPULATION	AREA
Gladwin				21 607	505		
Gogebic				19 217	1 105		
Grand Traverse				57 547	466		
Gratiot				39 574	570		
Hillsdale				41 565	603		
Houghton				38 148	1 014		
Huron				35 867	830		
Ingham				270 681	560		
Ionia				52 503	577		
Iosco				30 680	546		
Iron				14 100	1 163		
Isabella				54 659	576		
Jackson				143 728	705		
Kalamazoo				215 916	562		
Kalkaska				11 623	563		
Kent				465 963	862		
Keweenaw				2 096	544		
Lake				8 593	568		
Lapeer				68 766	658		
Leelanau				14 462	341		
Lenawee				87 729	753		
Livingston				100 690	575		
Luce				5 790	905		
Mackinac				10 241	1 025		
Macomb				684 008	483		
Manistee				22 152	543		
Marquette		71 997	1 882				
Mason				26 439	495		
Mecosta				37 282	560		
Menominee				25 896	1 045		

STATE OF MICHIGAN (Continued)

COUNTY	VERY HIGH RISK POPULATION	AREA	HIGH RISK POPULATION	AREA	MEDIUM RISK POPULATION	AREA	LOW RISK POPULATION	AREA
Midland				76 114	525		
Missaukee				10 689	565		
Monroe				130 040	557		
Montcalm				50 284	713		
Montmorency				7 813	550		
Muskegon				155 184	507		
Newaygo				36 547	847		
Oakland				1 003 070	875		
Oceana				21 979	541		
Ogemaw				17 661	569		
Ontonagon				9 630	1 311		
Osceola				20 422	569		
Oscoda				6 914	568		
Otsego				15 421	516		
Ottawa				166 497	567		
Presque Isle				13 781	656		
Roscommon				18 544	528		
Saginaw				216 774	815		
St Clair				137 706	734		
St Joseph				58 102	503		
Sanilac				39 937	964		
Schoolcraft		8 415	1 173				
Shiawassee				67 929	541		
Tuscola				54 830	812		
Van Buren				66 432	612		
Washtenaw				265 283	710		
Wayne				2 148 063	615		
Wexford				26 401	566		
TOTAL STATE	---	---	128 678	5 140	8 902 100	51 879	---	---

FEMA Region 5 — MINNESOTA — Potential Fallout



+

Very High

High

S T A T E O F M I N N E S O T A - - F A L L O U T R I S K

Estimated 1985 Population: 4,181,231
 Land Area: 79,547 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Aitkin		13 615	1 834				
Anoka		214 648	430				
Becker	29 238	1 312						
Beltrami	33 755	2 507						
Benton		26 710	408				
Big Stone	7 694	497						
Blue Earth		51 263	749				
Brown		28 437	610				
Carlton		30 176	864				
Carver		39 822	351				
Cass	21 799	2 033						
Chippewa		14 480	584				
Chisago		28 024	417				
Clay	48 492	1 049						
Clearwater	8 958	1 000						
Cook		4 068	1 412				
Cottonwood		14 015	640				
Crow Wing		43 714	1 008				
Dakota		218 358	575				
Dodge		15 445	439				
Douglas	29 249	644						
Fairbault		18 552	714				
Fillmore		21 505	862				
Freeborn		35 034	705				
Goodhue		39 373	763				

STATE OF MINNESOTA (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Grant	6 899	547						
Hennepin		969 049	541				
Houston		18 852	564				
Hubbard	14 427	936						
Isanti		25 121	440				
Itasca	42 784	2 661						
Jackson		13 471	699				
Kanabec		12 663	527				
Kandiyohi		38 440	784				
Kittson	6 467	1 104						
Koochiching	16 344	3 108						
Lac Qui Parle		10 177	772				
Lake		11 624	2 053				
Lake of the Wood	3 775	1 296						
Le Sueur		23 743	446				
Lincoln		7 811	539				
Lyon		25 402	714				
McLeod		30 687	489				
Mahnomen	5 369	559						
Marshall	12 456	1 760						
Martin		24 921	706				
Meeker		21 191	624				
Mille Lacs		18 965	578				
Morrison		30 289	1 124				
Mower		39 199	711				
Murray		10 926	702				
Nicollet		27 475	440				
Nobles		21 185	714				
Norman	8 628	877						
Olmsted		97 282	655				

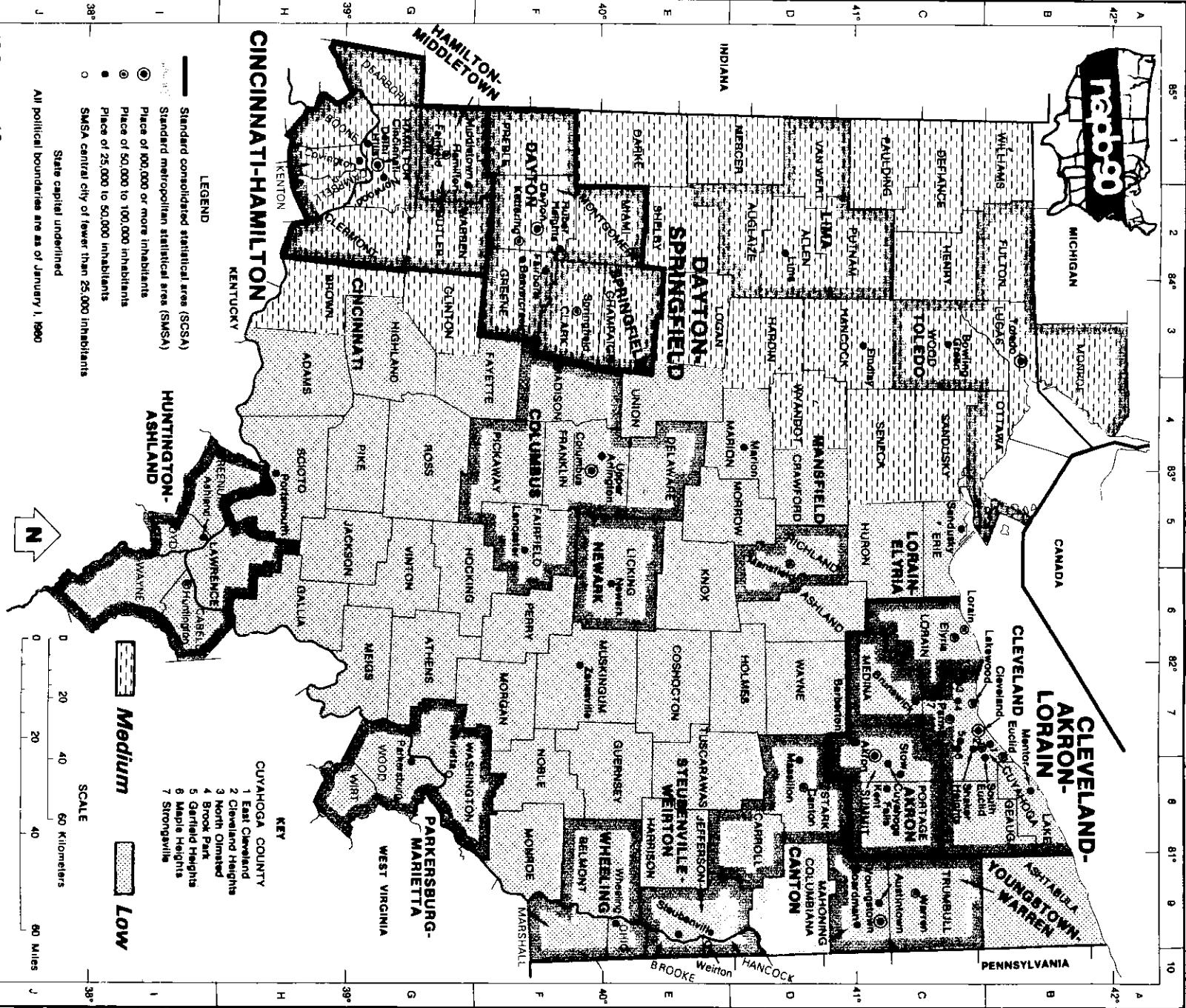
STATE OF MINNESOTA (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Otter Tail	52 568	1 973						
Pennington	13 745	618						
Pine		21 028	1 421				
Pipestone		11 155	466				
Polk	33 479	1 981						
Pope	11 767	668						
Ramsey		469 833	154				
Red Lake	5 145	433						
Redwood		19 036	881				
Renville		19 875	984				
Rice		47 643	501				
Rock		10 482	483				
Roseau	12 588	1 677						
St Louis		206 555	6 125				
Scott		47 955	357				
Sherburne		33 369	435				
Sibley		15 312	593				
Stearns		113 166	1 338				
Steele		29 841	431				
Stevens	10 574	560						
Swift		12 526	742				
Todd	25 886	941						
Traverse	5 391	575						
Wabasha		19 538	537				
Wadena	13 856	537						
Waseca		18 502	422				
Washington		125 448	390				
Watonwan		12 366	435				
Wilkin	7 996	751						
Winona		46 636	630				

STATE OF MINNESOTA (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Wright		62 769	672				
Yellow Medicine		13 155	759				
TOTAL STATE	489 329	32 604	3 691 902	46 943	---	---	---	---

FEMA Region 5 – OHIO – Potential Fallout



STATE OF OHIO -- FALLOUT RISK

Estimated 1985 Population: 10,638,633
 Land Area: 41,006 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Adams						24 825	586
Allen		108 246	405				
Ashland						46 416	424
Ashtabula						100 965	703
Athens						58 385	508
Auglaize		43 248	398				
Belmont						81 529	537
Brown		33 844	493				
Butler		267 089	465				
Carroll						27 213	393
Champaign		33 387	429				
Clark		146 853	398				
Clermont		138 508	456				
Clinton		34 895	410				
Columbiana						11 603	534
Coshocton						36 487	566
Crawford						48 719	403
Cuyahoga						1 451 046	459
Darke		53 525	606				
Defiance						38 008	414
Delaware						58 142	443
Erie						77 447	264
Fairfield						96 335	506
Fayette						27 400	405
Franklin						899 877	542

STATE OF OHIO (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Fulton					38 575	407		
Gallia							30 092	471
Geauga							75 013	408
Greene					129 410	415		
Guernsey							41 304	522
Hamilton					861 633	412		
Hancock					64 917	532		
Hardin					31 387	471		
Harrison							16 159	400
Henry					28 187	415		
Highland							34 376	553
Hocking							24 746	423
Holmes							30 289	424
Huron							55 072	495
Jackson							29 753	420
Jefferson							86 780	410
Knox							47 613	529
Lake							216 175	231
Lawrence							62 576	456
Licking							124 764	686
Logan					39 597	458		
Lorain							270 340	495
Lucas					462 017	341		
Madison							34 949	467
Mahoning							279 136	417
Marion							66 049	403
Medina							116 655	422
Meigs							23 696	432
Mercer					38 647	457		
Miami							88 976	410

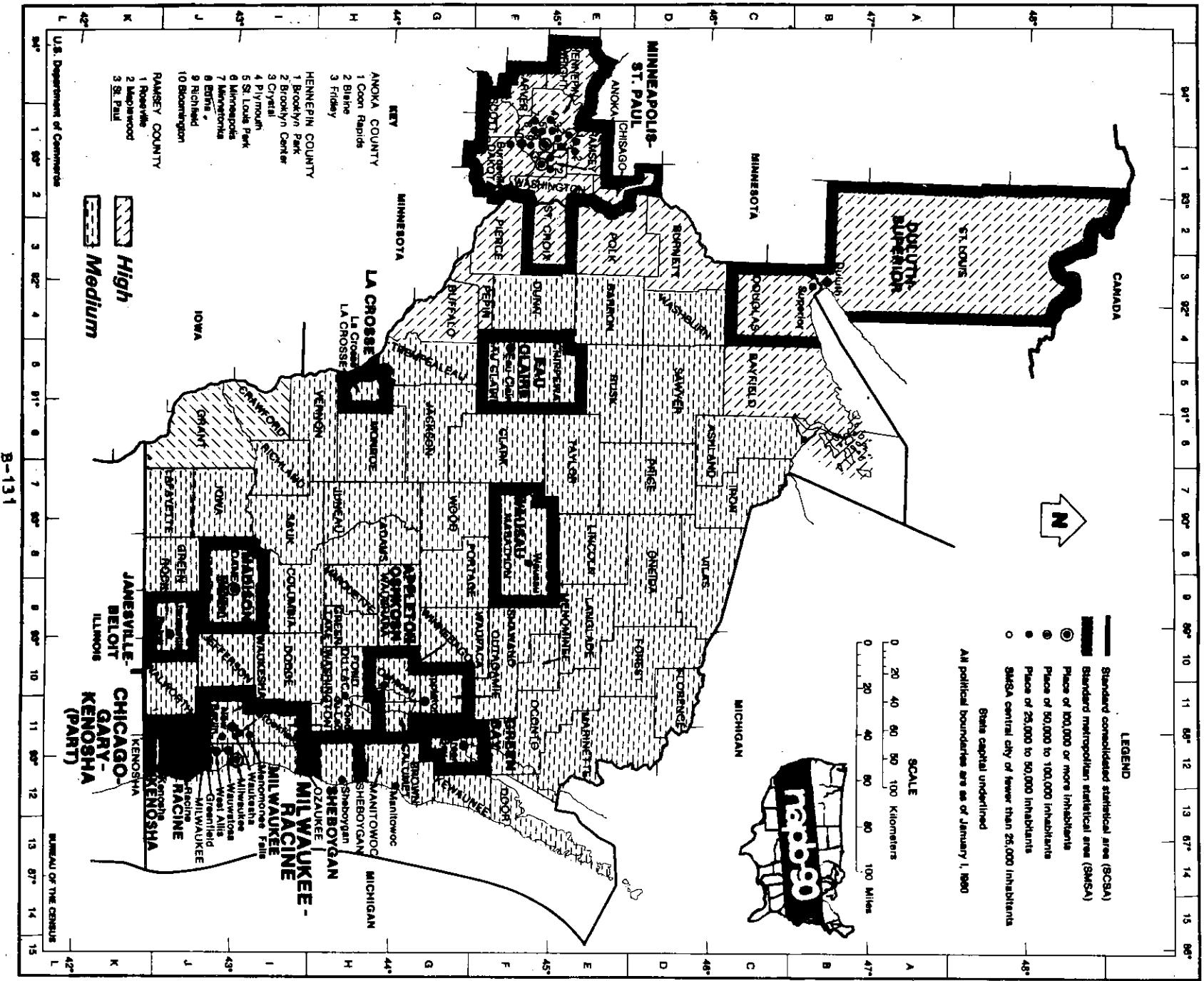
STATE OF OHIO (Continued)

COUNTY	VERY HIGH RISK POPULATION	AREA	HIGH RISK POPULATION	AREA	MEDIUM RISK POPULATION	AREA	LOW RISK POPULATION	AREA
Monroe						16 091	458
Montgomery		561 738	458				
Morgan						14 056	420
Morrow						26 564	406
Muskingum						84 376	654
Noble						11 231	399
Ottawa		39 633	253				
Paulding		20 507	419				
Perry						31 855	412
Pickaway						42 544	503
Pike						24 296	443
Portage						137 910	493
Preble		38 517	426				
Putnam		33 276	484				
Richland						128 552	497
Ross						68 139	692
Sandusky		61 918	409				
Scioto						84 422	614
Seneca		61 233	553				
Shelby		43 360	409				
Stark						376 852	574
Summit						509 599	412
Trumbull						235 536	612
Tuscarawas						85 576	569
Union						31 017	437
Van Wert		29 833	410				
Vinton						11 473	414
Warren		103 313	403				
Washington						64 922	640
Wayne						100 270	557

STATE OF OHIO (Continued)

COUNTY	VERY HIGH RISK POPULATION	AREA	HIGH RISK POPULATION	AREA	MEDIUM RISK POPULATION	AREA	LOW RISK POPULATION	AREA
Williams				36 158	422		
Wood				108 636	619		
Wyandot				22 355	406		
TOTAL STATE	---	---	---	---	3 714 442	13 639	6 924 191	27 367

FEMA Region 5 – WISCONSIN – Potential Fallout



S T A T E O F W I S C O N S I N -- F A L L O U T R I S K

Estimated 1985 Population: 4,779,553
 Land Area: 54,424 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Adams				13 859	648		
Ashland				17 248	1 048		
Barron				39 553	865		
Bayfield	14 400	1 462					
Brown				182 756	524		
Buffalo	14 572	699					
Burnett	13 869	818					
Calumet				33 511	326		
Chippewa				53 660	1 017		
Clark				34 020	1 218		
Columbia				44 916	771		
Crawford	16 679	566					
Dane				335 264	1 205		
Dodge				76 135	887		
Door				26 236	492		
Douglas	43 876	1 305					
Dunn				34 908	853		
Eau Claire				83 603	638		
Florence				4 025	486		
Fond du Lac				89 789	725		
Forest				9 364	1 011		
Grant				51 842	1 144		
Green	30 446	583					
Green Lake				19 281	357		
Iowa				20 743	760		

STATE OF WISCONSIN (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Iron				6 280		751	
Jackson				16 607		998	
Jefferson				66 968		562	
Juneau				21 336		774	
Kenosha				120 916		273	
Kewaunee				20 184		343	
La Crosse				93 613		457	
LaFayette				17 175		634	
Langlade				20 122		873	
Lincoln				28 174		886	
Manitowoc				83 201		594	
Marathon				112 970	1	559	
Marinette				40 352	1	395	
Marquette				12 737		454	
Menominee				3 832		359	
Milwaukee				951 403		241	
Monroe				36 025		904	
Oconto				30 044	1	002	
Oneida				31 238	1	130	
Outagamie				133 891		642	
Ozaukee				67 465		235	
Pepin	7 643	231					
Pierce	32 390	576					
Polk	34 191	919					
Portage				57 011		810	
Price				16 777	1	256	
Racine				173 954		334	
Richland				17 627		585	
Rock				138 419		724	
Rusk				16 110		913	

STATE OF WISCONSIN (Continued)

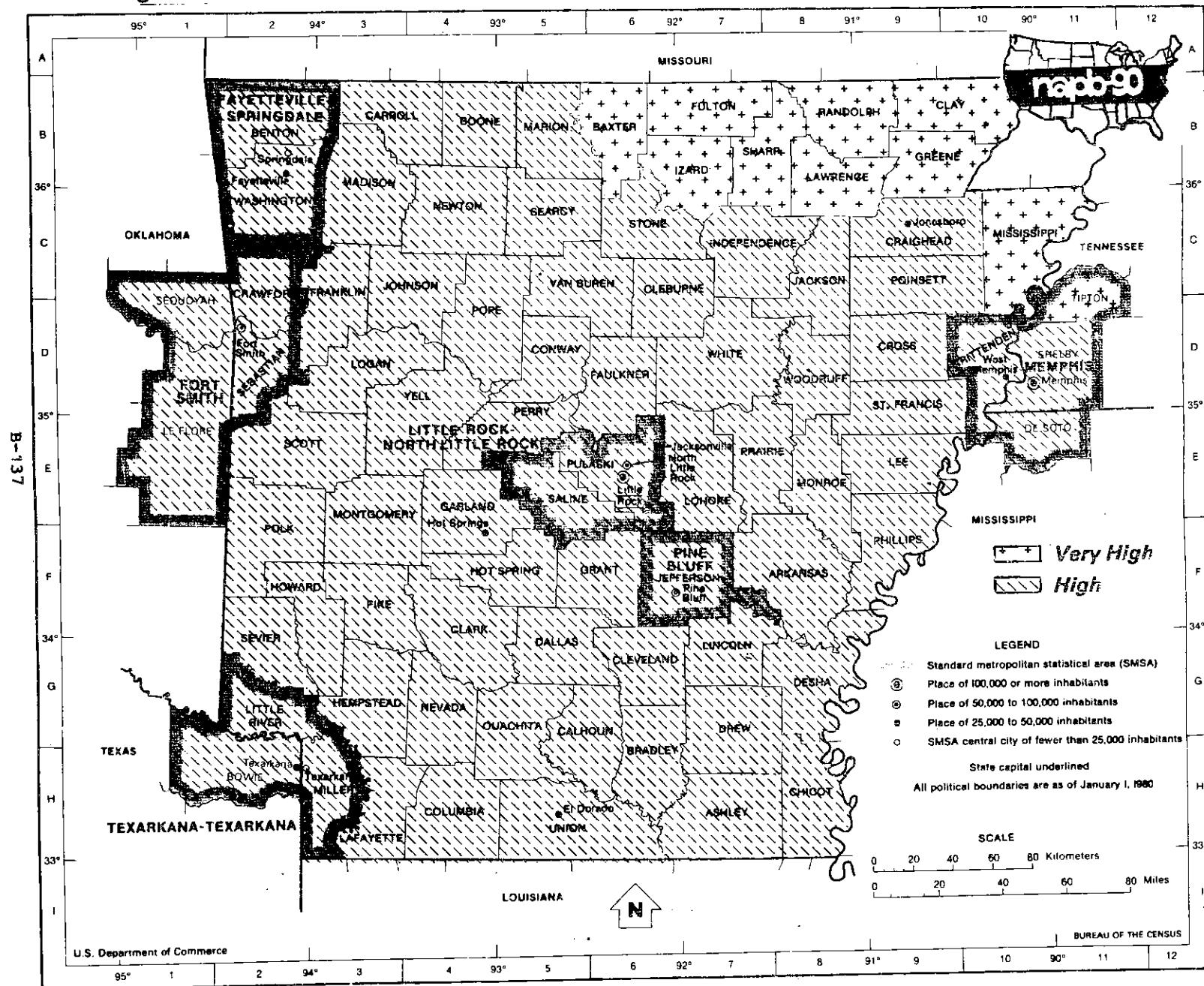
COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
St Croix	45 277	723					
Sauk			44 873	838			
Sawyer			14 310	1 255			
Shawano			36 820	897			
Sheboygan			102 389	515			
Taylor			18 660	975			
Trempealeau			26 132	736			
Vernon			26 772	808			
Vilas			17 750	867			
Walworth			70 757	556			
Washburn			13 767	815			
Washington			87 947	431			
Waukesha			286 077	554			
Waupaca			43 959	754			
Waushara			19 321	628			
Winnebago			133 994	449			
Wood			77 538	801			
TOTAL STATE	---	---	253 343	7 882	4 526 210	46 542	---	---

F E M A R E G I O N V I - - F A L L O U T R I S K S U M M A R Y

Estimated 1985 Population: 28,140,362
 Land Area: 548,583 square miles

STATE	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Arkansas	240 621	6 294	2 123 020	45 788	---	---	---	---
Louisiana	---	---	902 197	13 964	520 327	9 614	3 102 495	20 942
New Mexico	---	---	60 404	6 066	184 826	12 435	1 215 553	102 835
Oklahoma	72 601	2 661	1 666 762	30 051	1 625 556	35 944	---	---
Texas	---	---	126 824	2 882	4 188 147	45 076	12 111 029	214 031
TOTAL REGION VI	313 222	8 955	4 879 207	98 751	6 518 856	103 069	16 429 077	337 808

FEMA Region 6 — ARKANSAS — *Potential Fallout*



S T A T E O F A R K A N S A S -- F A L L O U T R I S K

Estimated 1985 Population: 2,363,641
 Land Area: 52,082 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Arkansas		24 025	1 006				
Ashley		26 615	934				
Baxter	30 117	546						
Benton		86 071	844				
Boone	28 115	584						
Bradley		13 434	654				
Calhoun		6 162	629				
Carroll		17 597	634				
Chicot		18 017	649				
Clark		23 166	867				
Clay	19 819	641						
Cleburne		19 153	551				
Cleveland		8 119	599				
Columbia		27 495	767				
Conway		19 479	558				
Craighead		63 470	713				
Crawford		40 173	593				
Crittenden		50 180	599				
Cross		20 753	622				
Dallas		11 014	668				
Desha		19 698	746				
Drew		17 946	831				
Faulkner		50 628	646				
Franklin		15 588	609				
Fulton	10 449	616						

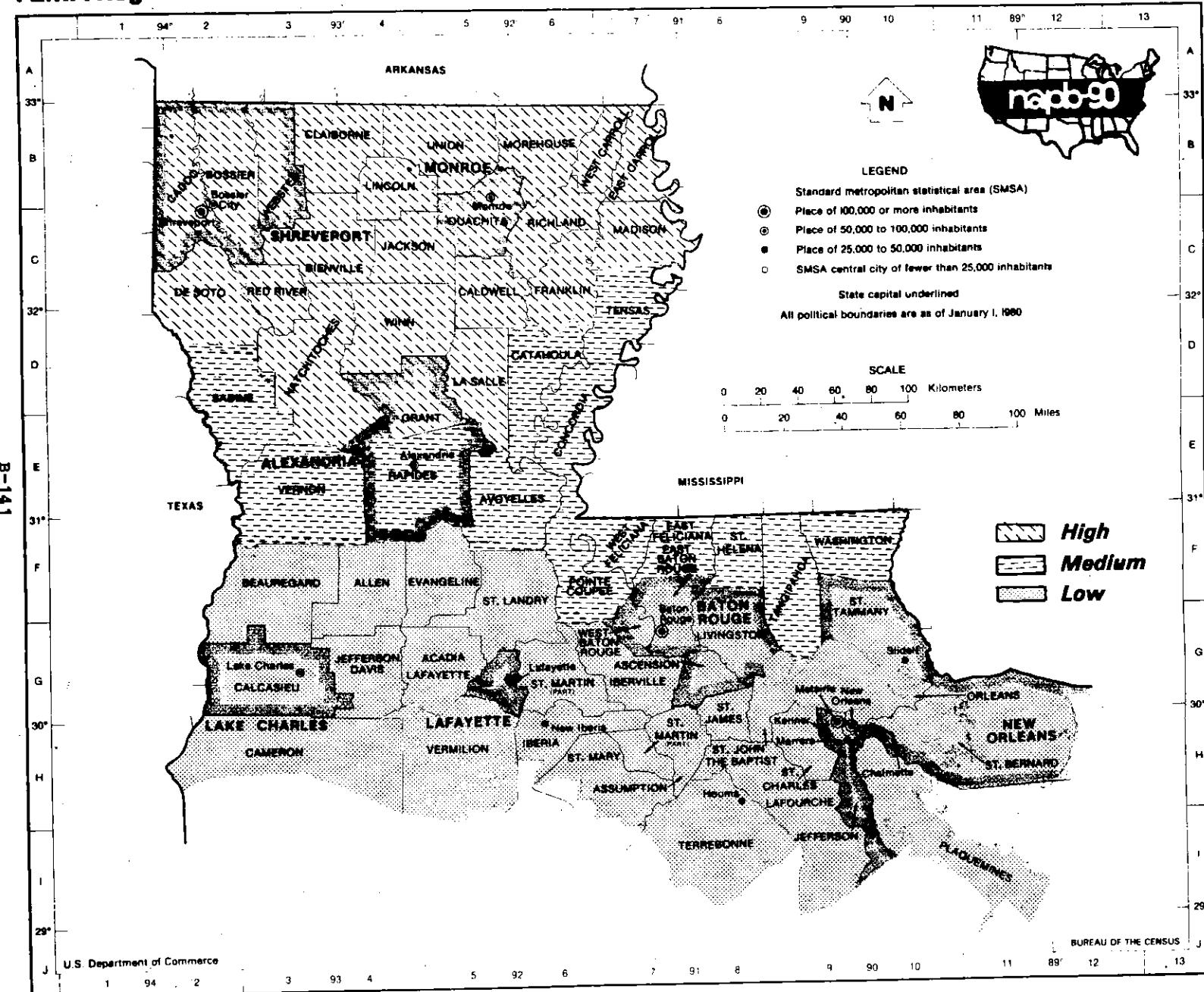
STATE OF ARKANSAS (Continued)

COUNTY	VERY HIGH RISK POPULATION	AREA	HIGH RISK POPULATION	AREA	MEDIUM RISK POPULATION	AREA	LOW RISK POPULATION	AREA
Garland		74 774	657				
Grant		13 183	633				
Greene	31 370	578						
Hempstead		23 615	725				
Hot Spring		27 264	615				
Howard		13 584	574				
Independence		32 517	763				
Izard	11 018	581						
Jackson		21 479	633				
Jefferson		90 496	882				
Johnson		18 525	676				
LaFayette		10 093	518				
Lawrence	18 546	589						
Lee		15 391	602				
Lincoln		13 046	563				
Little River		14 145	516				
Logan		20 662	717				
Lonoke		37 233	783				
Madison		11 851	837				
Marion		12 601	587				
Miller		39 656	619				
Mississippi	59 199	897						
Monroe		13 383	609				
Montgomery		7 782	775				
Nevada		10 970	620				
Newton		8 207	823				
Ouachita		33 443	737				
Perry		7 924	551				
Phillips		33 653	685				
Pike		10 051	598				

STATE OF ARKANSAS (Continued)

COUNTY	VERY HIGH RISK POPULATION	AREA	HIGH RISK POPULATION	AREA	MEDIUM RISK POPULATION	AREA	LOW RISK POPULATION	AREA
Poinsett		25 939	762				
Polk		17 508	860				
Pope		42 387	820				
Prairie		10 052	656				
Pulaski		352 946	767				
Randolph	16 315	656						
St Francis		31 547	639				
Saline		56 244	725				
Scott		9 906	897				
Searcy		8 941	668				
Sebastian		97 960	535				
Sevier		14 471	560				
Sharp	15 673	606						
Stone		9 766	606				
Union		49 350	1 053				
Van Buren		15 337	709				
Washington		104 872	951				
White		52 827	1 040				
Woodruff		10 516	592				
Yell		18 140	931				
TOTAL STATE	240 621	6 294	2 123 020	45 788	---	---	---	---

FEMA Region 6 – LOUISIANA – Potential Fallout



S T A T E O F L O U I S I A N A -- F A L L O U T R I S K

Estimated 1985 Population: 4,525,019
 Land Area: 44,520 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Acadia							
Allen						59 861	657
Ascension						21 908	766
Assumption						58 862	296
Avoyelles						23 808	342
					43 773	846		
Beauregard							
Bienville	16 855	815				32 564	1 163
Bossier	90 980	845					
Caddo	276 755	894					
Calcasieu						176 853	1 081
Caldwell	11 466	541					
Cameron							
Catahoula				12 760	732	10 180	1 417
Claiborne	18 483	765					
Concordia				23 966	717		
De Soto	27 693	880					
East Baton Rouge							
East Carroll	11 376	426				397 601	458
East Feliciana				20 727	455		
Evangeline						35 372	667
Franklin	24 409	636					
Grant	18 370	653					
Iberia							
Iberville						70 124	589
Jackson	17 125	578				33 300	637

STATE OF LOUISIANA (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Jefferson							479 824	347
Jefferson Davis							33 174	655
LaFayette							175 046	270
LaFourche							99 854	1 141
LaSalle		17 629	638					
Lincoln		43 102	472					
Livingston							71 703	661
Madison		15 430	631					
Morehouse		35 796	807					
Natchitoches							40 047	1 264
Orleans							559 384	199
Ouachita		143 485	627					
Plaquemines								
Pointe Coupee					24 933	566		
Rapides					139 793	1 341		
Red River		10 989	394					
Richland		22 884	563					
Sabine					27 588	855		
St Bernard							68 168	486
St Charles							42 789	286
St Helena					10 406	409		
St James							22 121	248
St John Baptist							41 836	213
St Landry							90 161	936
St Martin							47 258	749
St Mary							65 424	613
St Tammany							142 182	873
Tangipahoa					93 622	783		
Tensas					8 292	623		
Terrebonne							103 873	1 367

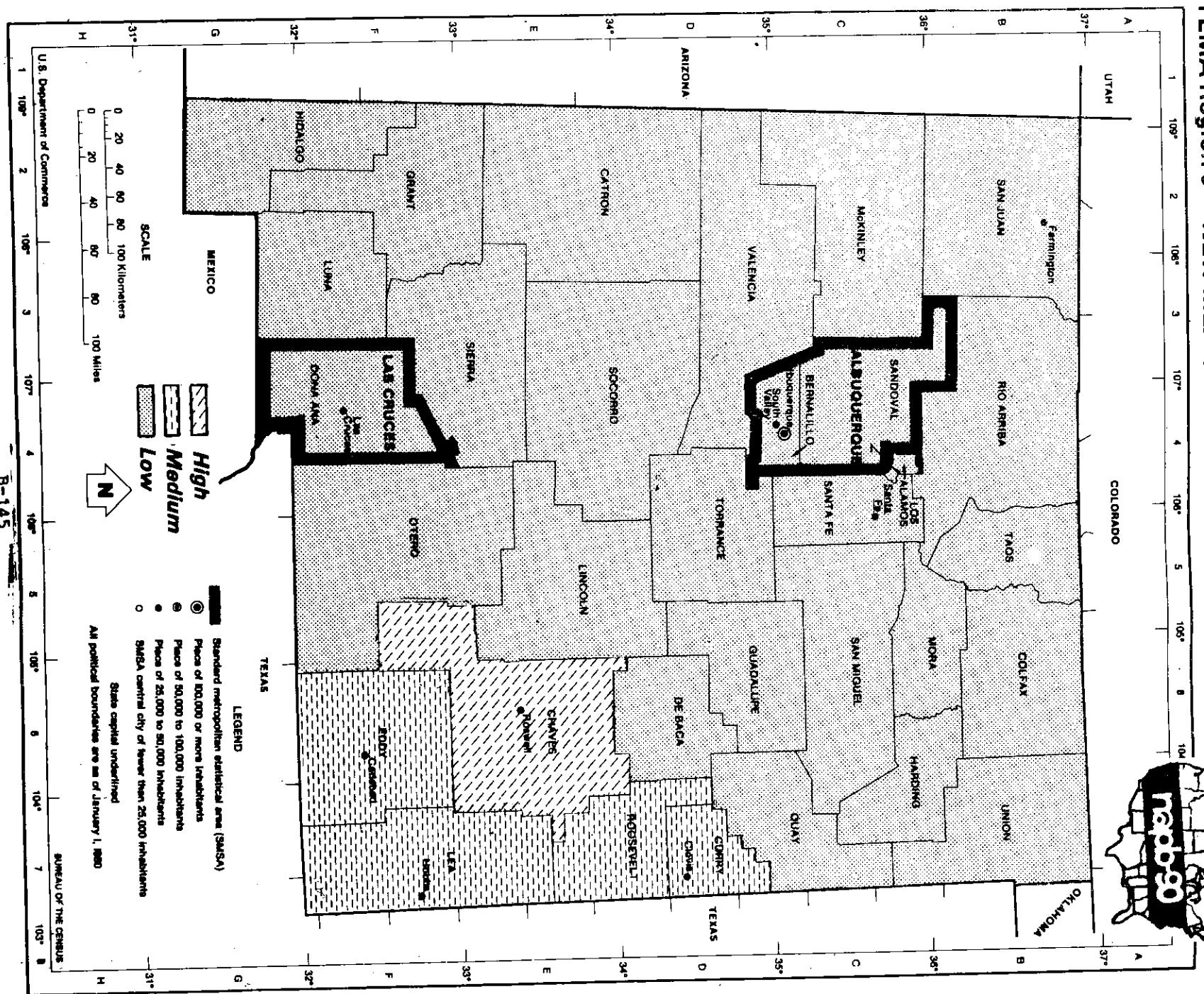
STATE OF LOUISIANA (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Union		22 551	884				
Vermilion				54 232	1 205		
Vernon							
Washington				46 376	676	62 258	1 332
Webster		45 935	602				
West Baton Rouge						20 678	194
West Carroll		13 224	360				
West Feliciana				13 859	406		
Winn		17 660	953				
TOTAL STATE	---	---	902 197	13 964	520 327	9 614	3 102 495	20 942

FEMA Region 6 – NEW MEXICO – *Potential Fallout*

FEMA Region 6 – NEW MEXICO – Potential Failure

卷之三



STATE OF NEW MEXICO -- FALLOUT RISK

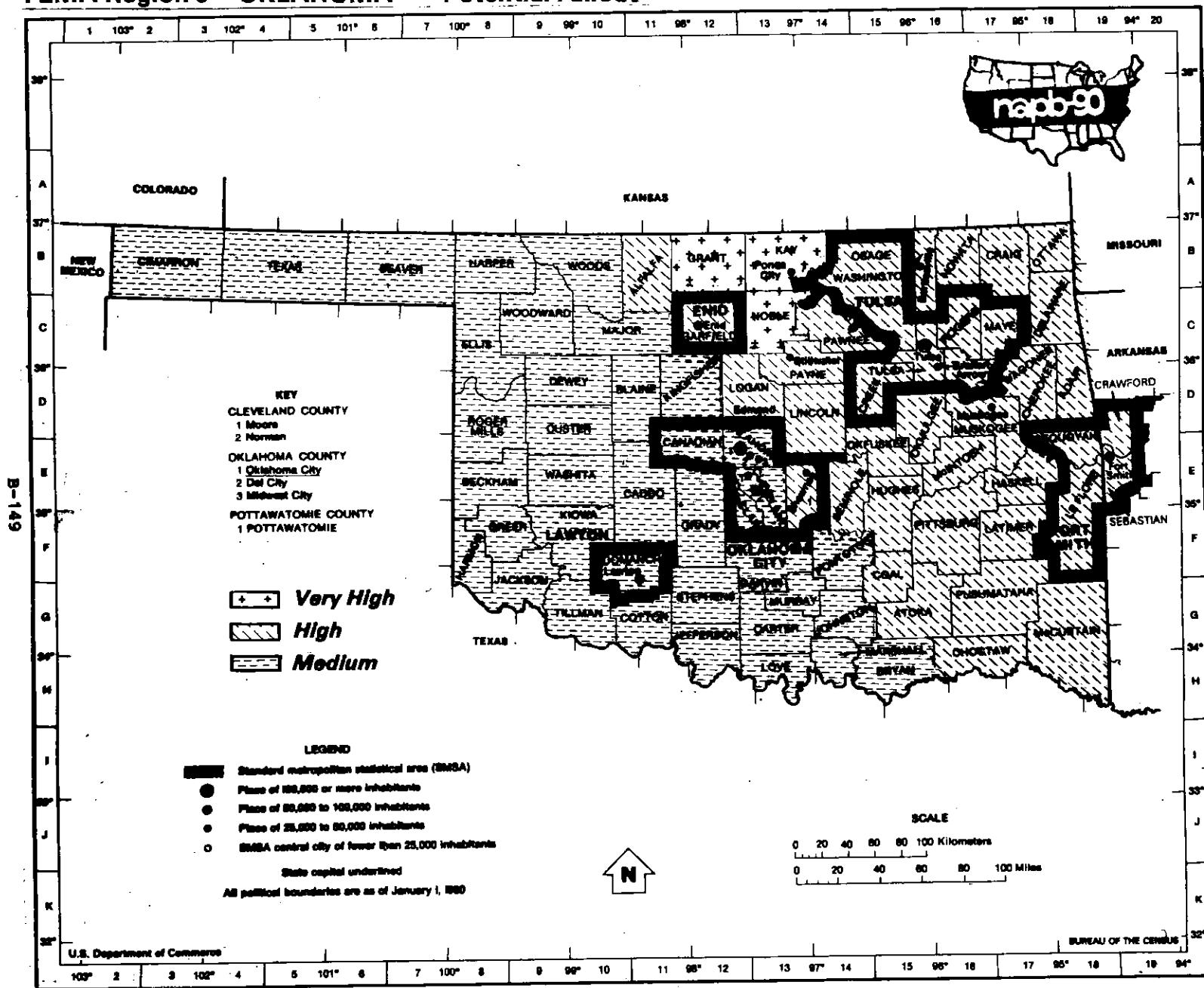
Estimated 1985 Population: 1,460,783
 Land Area: 121,336 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Bernalillo						456 640	1 169
Catron						2 781	6 929
Chaves	60 404	6 066					
Colfax						13 280	3 762
Curry				44 347	1 408		
DeBaca						2 278	2 323
Dona Ana						116 120	3 819
Eddy				55 403	4 184		
Grant						27 992	3 969
Guadalupe						4 448	3 032
Harding						946	2 122
Hidalgo						6 462	3 445
Lea				68 068	4 390		
Lincoln						14 173	4 832
Los Alamos						19 396	109
Luna						16 846	2 965
McKinley						62 558	5 442
Mora						4 909	1 930
Otero						50 681	6 626
Quay						10 634	2 874
Rio Arriba						32 805	5 856
Roosevelt				17 008	2 453		
Sandoval						35 678	3 707
San Juan						99 037	5 522
San Miguel						24 909	4 709

STATE OF NEW MEXICO (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Santa Fe		82 898	1 905
Sierra		9 058	4 178
Socorro		15 027	6 625
Taos		21 094	2 204
Torrance		8 397	3 335
Union		5 531	3 830
Valencia		70 975	5 616
TOTAL STATE	---	---	60 404	6 066	184 826	12 435	1 215 553	102 835

FEMA Region 6 – OKLAHOMA – *Potential Fallout*



S T A T E O F O K L A H O M A -- F A L L O U T R I S K

Estimated 1985 Population: 3,364,919
 Land Area: 68,656 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Adair	20 474	577					
Alfalfa	7 148	864					
Atoka	13 806	980					
Beaver				7 451	1 808		
Beckham				28 439	904		
Blaine				14 513	920		
Bryan				32 184	902		
Caddo				34 998	1 286		
Canadian				71 951	902		
Carter				47 692	827		
Cherokee	34 575	748					
Choctaw	16 400	763					
Cimarron				4 046	1 842		
Cleveland				160 572	529		
Coal	5 816	520					
Comanche				121 146	1 076		
Cotton				6 987	656		
Craig	15 333	763					
Creek	72 149	930					
Custer				36 008	981		
Delaware	28 310	720					
Dewey				6 721	1 007		
Ellis				6 483	1 232		
Garfield	66 024	1 060					
Garvin				31 029	813		

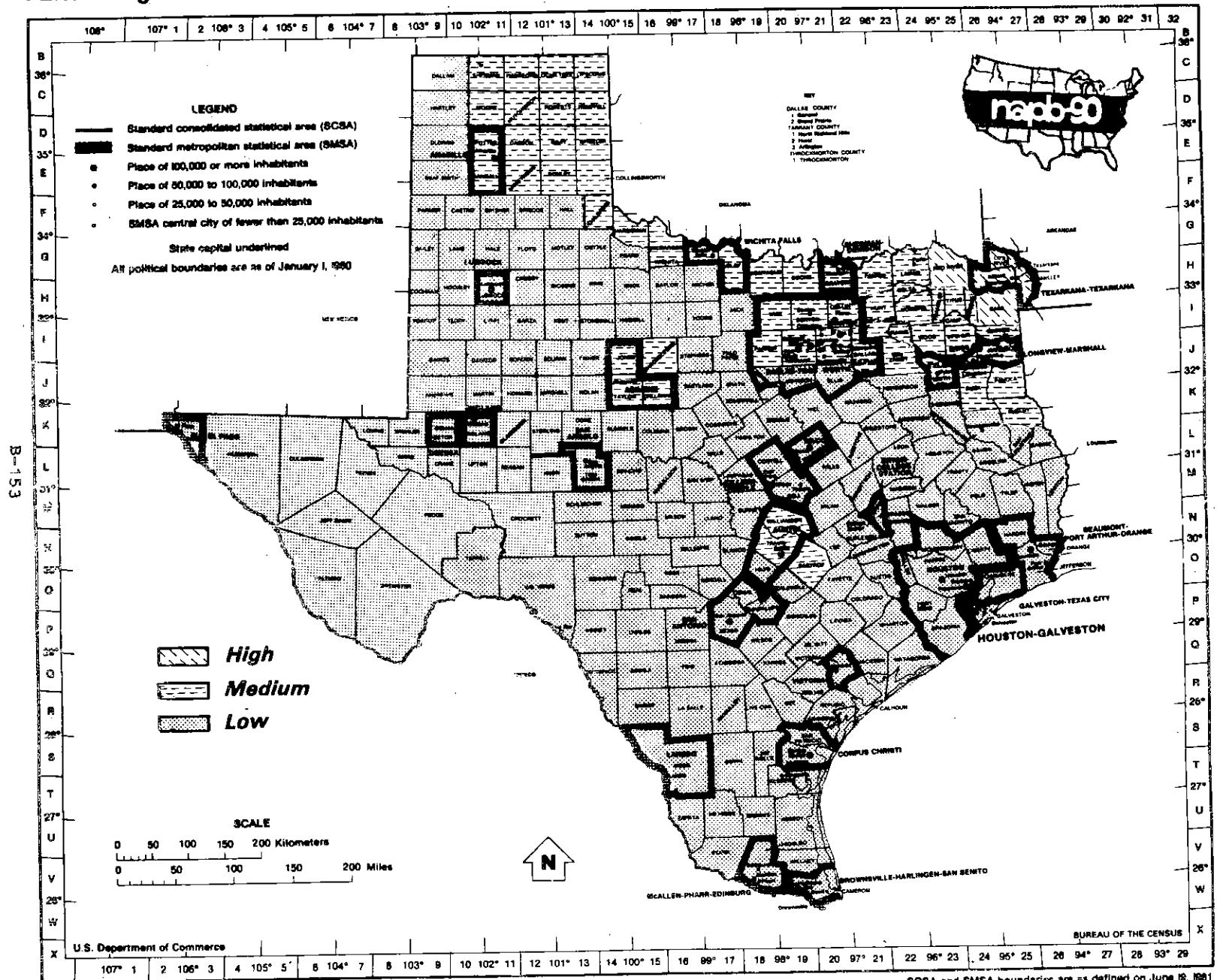
STATE OF OKLAHOMA (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Grady						46 202	1 106
Grant	6 713	1 004					7 290	638
Greer						4 422	537
Harmon						4 839	1 039
Harper							
Haskell		11 927	570				
Hughes		15 085	805				
Jackson						30 803	817
Jefferson						8 759	769
Johnston						10 912	639
Kay	53 759	921						
Kingfisher						16 877	906
Kiowa						12 812	1 019
Latimer		10 152	728				
Le Flore		43 438	1 585				
Lincoln		30 539	964				
Logan		31 357	748				
Love						8 154	519
McClain						25 247	581
McCurtain		35 933	1 826				
McIntosh		17 305	599				
Major						9 516	958
Marshall						11 460	372
Mayes		35 187	644				
Murray						13 473	420
Muskogee		70 748	815				
Noble	12 129	736						
Nowata		11 552	541				
Oklfuskee		12 082	628				
Oklahoma						635 696	708

STATE OF OKLAHOMA (Continued)

COUNTY	VERY HIGH RISK POPULATION	AREA	HIGH RISK POPULATION	AREA	MEDIUM RISK POPULATION	AREA	LOW RISK POPULATION	AREA
Omulgee		40 403	698				
Osage		42 658	2 264				
Ottawa		33 882	465				
Pawnee		17 176	551				
Payne		65 992	691				
Pittsburg		43 109	1 251				
Pontotoc				34 762	717		
Pottawatomie		62 945	783				
Pushmataha		11 880	1 417				
Roger Mills				6 385	1 146		
Rogers		56 007	683				
Seminole		29 055	639				
Sequoyah		33 645	678				
Stephens				46 259	885		
Texas				18 201	2 040		
Tillman				11 650	904		
Tulsa		519 654	571				
Wagoner		52 032	559				
Washington		52 984	423				
Washita				17 419	1 006		
Woods				10 827	1 291		
Woodward				23 371	1 242		
TOTAL STATE	72 601	2 661	1 666 762	30 051	1 625 556	35 944	---	---

FEMA Region 6 — TEXAS — Potential Fallout



SCSA and SMSA boundaries are as defined on June 18, 1981

S T A T E O F T E X A S - - F A L L O U T R I S K

Estimated 1985 Population: 16,426,000
 Land Area: 261,989 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Anderson							47 651	1 077
Andrews							16 609	1 501
Angelina							69 361	807
Aransas							17 801	280
Archer							8 179	907
Armstrong			1 937	910				
Atrascosa							28 715	1 218
Austin							21 150	656
Bailey							8 227	827
Bandera							8 732	793
Bastrop			32 710	895				
Baylor							5 126	862
Bee							29 378	880
Bell							169 465	1 055
Bexar							1 117 869	1 248
Blanco							5 508	714
Borden							1 003	900
Bosque							14 289	989
Bowie		80 151	891					
Brazoria							190 191	1 407
Brazos							123 285	588
Brewster							8 213	6 169
Briscoe							2 266	887
Brooks							9 279	942
Brown							36 336	936

STATE OF TEXAS (Continued)

COUNTY	VERY HIGH RISK POPULATION	AREA	HIGH RISK POPULATION	AREA	MEDIUM RISK POPULATION	AREA	LOW RISK POPULATION	AREA
Burleson						15 837	668
Burnet						22 587	994
Caldwell						27 133	546
Calhoun						22 997	540
Callahan				13 009	899		
Cameron						248 893	905
Camp						10 465	203
Carson				7 188	924		
Cass		30 977	937				
Castro						10 177	899
Chambers						20 132	616
Cherokee						39 769	1 052
Childress				6 452	707		
Clay				9 871	1 085		
Cochran						4 732	775
Coke						3 706	908
Coleman						10 468	1 277
Collin				187 101	851		
Collingsworth				4 072	909		
Colorado						20 306	964
Comal						44 827	555
Comanche						13 217	930
Concho						2 977	992
Cooke				29 097	893		
Coryell						58 932	1 057
Cottle						2 633	895
Crane						5 350	782
Crockett						5 035	2 806
Crosby						8 432	898
Culberson						3 509	3 815

STATE OF TEXAS (Continued)

COUNTY	VERY HIGH RISK POPULATION	AREA	HIGH RISK POPULATION	AREA	MEDIUM RISK POPULATION	AREA	LOW RISK POPULATION	AREA
Dallam						6 796	1 505
Dallas		1 765 074	880				
Dawson						17 059	903
Deaf Smith						20 205	1 497
Delta				4 944	279		
Denton						174 001	911
De Witt						20 656	910
Dickens						3 090	907
Dimmit						12 065	1 307
Donley				4 208	929		
Duval						13 548	1 795
Eastland						21 456	924
Ector						151 738	903
Edwards						2 168	2 102
Ellis						69 192	939
El Paso						538 075	1 014
Erath						24 905	1 080
Falls						18 274	770
Fannin				24 681	895		
Fayette						20 407	950
Fisher						5 741	897
Floyd						8 802	992
Foard						1 849	703
Fort Bend						191 398	876
Franklin				7 415	294		
Freestone						17 218	888
Frio						14 644	1 133
Gaines						14 581	1 504
Galveston						220 241	399
Garza						5 720	895

STATE OF TEXAS (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Gillespie							15 622	1 061
Glasscock							1 251	900
Goliad							5 897	859
Gonzales							19 081	1 068
Gray					27 503	921		
Grayson					95 891	934		
Gregg					114 058	273		
Grimes							17 968	799
Guadalupe							54 862	713
Hale							37 243	1 005
Hall							4 963	876
Hamilton							8 136	836
Hansford					6 590	921		
Hardeman					6 589	688		
Hardin							44 075	898
Harris							2 831 639	1 734
Harrison					58 471	908		
Hartley							3 633	1 462
Haskell							7 515	901
Hays							51 765	678
Hemphill					6 418	903		
Henderson							52 080	888
Hidalgo							350 518	1 569
Hill							27 335	968
Hockley							24 809	908
Hood							25 815	425
Hopkins					28 369	789		
Houston							23 673	1 234
Howard							38 311	901
Hudspeth							2 620	4 566

STATE OF TEXAS (Continued)

COUNTY	VERY HIGH RISK POPULATION	AREA	HIGH RISK POPULATION	AREA	MEDIUM RISK POPULATION	AREA	LOW RISK POPULATION	AREA
Hunt		65 278		840			
Hutchinson		30 287		871			
Irion						1 800	1 052
Jack						7 639	920
Jackson						13 946	844
Jasper						32 469	921
Jeff Davis						1 770	2 258
Jefferson						260 403	937
Jim Hogg						5 464	1 136
Jim Wells						40 710	867
Johnson						85 375	731
Jones		18 960		931			
Karnes		13 498		753			
Kaufman						49 484	788
Kendall						13 788	663
Kenedy						485	1 389
Kent						1 100	878
Kerr						33 638	1 107
Kimble						4 297	1 250
King						430	914
Kinney						2 407	1 359
Kleberg						34 983	853
Knox						5 583	845
Lamar		44 953		919			
Lamb						17 077	1 013
Lampasas						13 753	714
La Salle						5 960	1 517
Lavaca						18 238	971
Lee						14 220	631
Leon						11 710	1 078

STATE OF TEXAS (Continued)

COUNTY	VERY HIGH RISK POPULATION	AREA	HIGH RISK POPULATION	AREA	MEDIUM RISK POPULATION	AREA	LOW RISK POPULATION	AREA
Liberty						55 859	1 174
Limestone						21 699	931
Lipscomb				4 310	933		
Live Oak						9 872	1 057
Llano						12 072	939
Loving						75	671
Lubbock						220 637	900
Lynn						7 834	888
McCulloch						8 849	1 071
McLennan						184 912	1 031
McMullen						934	1 163
Madison						12 236	473
Marion			10 734	385			
Martin						5 451	914
Mason						3 526	934
Matagorda						37 618	1 127
Maverick						36 420	1 287
Medina						25 049	1 331
Menard						2 408	902
Midland						121 309	902
Milam						23 556	1 019
Mills						4 590	748
Mitchell						9 286	912
Montague			18 758	928			
Montgomery						168 161	1 047
Moore				17 728	905		
Morris				15 523	256		
Motley						1 820	959
Nacogdoches						51 584	939
Navarro						39 336	1 068

STATE OF TEXAS (Continued)

COUNTY	VERY HIGH RISK POPULATION	AREA	HIGH RISK POPULATION	AREA	MEDIUM RISK POPULATION	AREA	LOW RISK POPULATION	AREA
Newton							13 436	935
Nolan							18 011	915
Nueces							305 867	847
Ochiltree					11 484	919		
Oldham							2 436	1 485
Orange							91 432	362
Palo Pinto							26 766	949
Panola					23 148	812		
Parker							54 135	902
Parmer							10 776	885
Pecos							17 658	4 776
Polk							30 680	1 061
Potter					108 666	902		
Presidio							5 405	3 857
Rains					5 979	243		
Randall					85 692	917		
Reagan							5 065	1 173
Real							2 784	697
Red River			15 696	1 054				
Reeves							15 924	2 626
Refugio							9 225	771
Roberts					1 062	915		
Robertson							16 266	864
Rockwall					20 181	128		
Runnels							12 504	1 056
Rusk					44 629	932		
Sabine							9 975	486
San Augustine							8 887	524
San Jacinto							14 075	572
San Patricio							64 171	693

STATE OF TEXAS (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
San Saba							6 003	1 136
Schleicher							3 314	1 309
Scurry							20 589	900
Shackelford					4 096	915		
Shelby					24 040	791		
Sherman					3 235	923		
Smith					148 646	932		
Somervell							4 528	188
Starr							33 795	1 226
Stephens							10 829	894
Sterling							1 641	923
Stonewall							2 466	925
Sutton							5 948	1 455
Swisher							8 860	902
Tarrant							1 047 540	868
Taylor					126 136	917		
Terrell							1 465	2 357
Terry							15 475	886
Throckmorton							2 384	912
Titus					23 389	412		
Tom Green							98 791	1 515
Travis					518 971	989		
Trinity							11 631	692
Tyler							18 854	922
Upshur					33 233	587		
Upton							5 783	1 243
Uvalde							24 016	1 564
Val Verde					41 253	3 150		
Van Zandt							37 028	855
Victoria							75 901	887

STATE OF TEXAS (Continued)

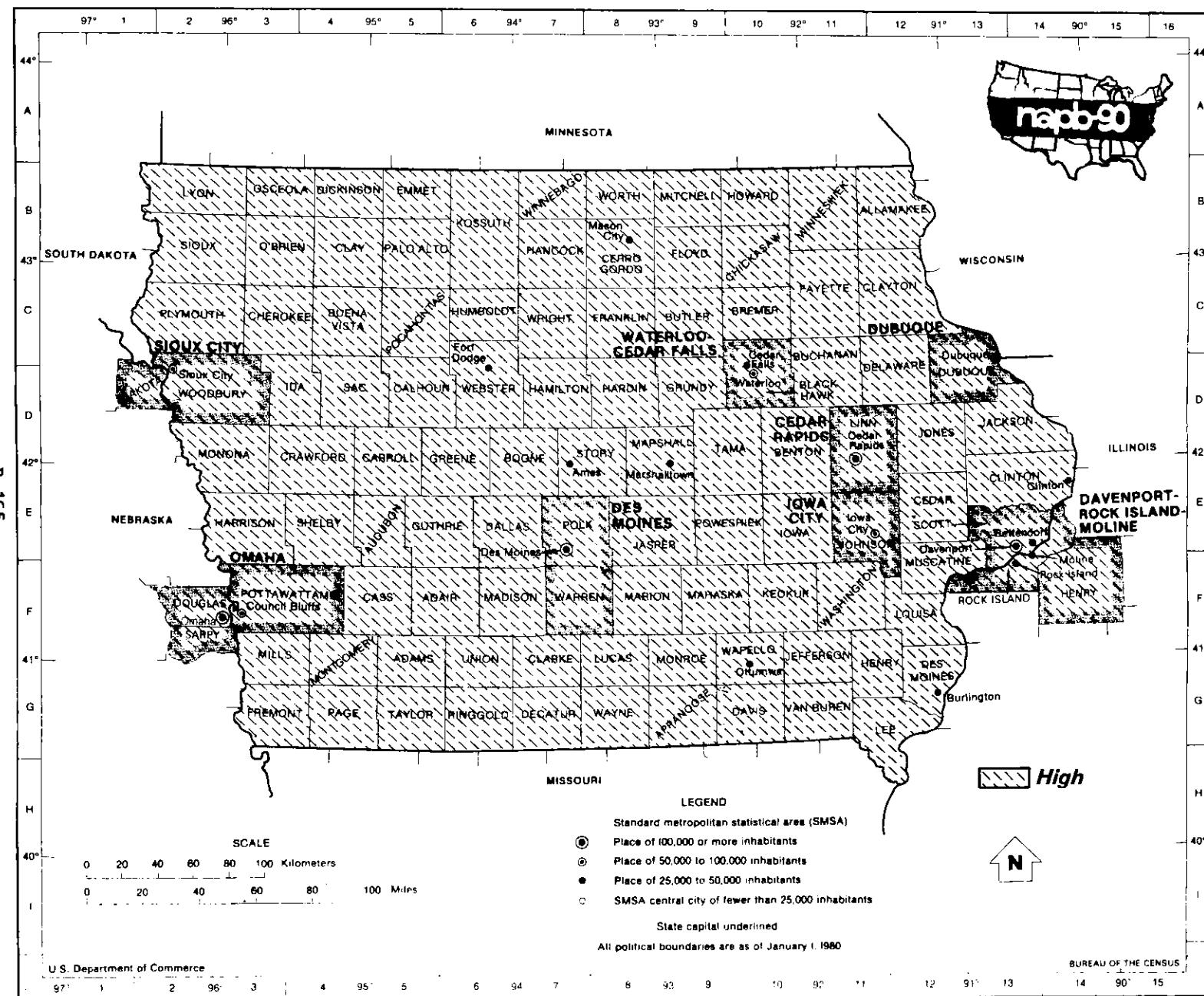
COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Walker						52 221	786
Waller						24 262	514
Ward						16 495	836
Washington						25 426	610
Webb						122 888	3 363
Wharton						41 409	1 086
Wheeler				8 502	905		
Witchita				127 426	606		
Wilbarger				16 904	947		
Willacy						18 857	589
Williamson			101 812	1 137			
Wilson						18 710	807
Winkler						11 236	840
Wise						31 679	902
Wood			27 986	689			
Yoakum						9 654	800
Young						20 063	919
Zapata						8 344	999
Zavala						12 247	1 289
TOTAL STATE	---	---	126 824	2 882	4 188 147	45 076	12 111 029	214 031

F E M A R E G I O N V I I - - F A L L O U T R I S K S U M M A R Y

Estimated 1985 Population: 11,925,241
Land Area: 282,971 square miles

STATE	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Iowa	---	---	2 906 939	55 964	---	---	---	---
Kansas	1 107 419	39 999	1 259 879	31 295	87 635	10 498	---	---
Missouri	3 339 896	43 945	1 628 662	24 631	---	---	---	---
Nebraska	429 634	56 943	1 185 177	19 696	---	---	---	---
TOTAL REGION VII	4 876 949	140 887	6 980 657	131 586	87 635	10 498	---	---

FEMA Region 7 – IOWA – Potential Fallout



STATE OF IOWA -- FALLOUT RISK

Estimated 1985 Population: 2,906,939
 Land Area: 55,964 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Adair		9 171	569				
Adams		5 535	425				
Allamakee		15 188	633				
Appanoose		14 710	498				
Audobon		8 169	444				
Benton		22 898	719				
Black Hawk		136 865	573				
Boone		25 946	573				
Bremer		24 669	439				
Buchanan		22 900	572				
Buena Vista		21 016	575				
Butler		17 310	582				
Calhoun		12 866	571				
Carroll		22 915	570				
Cass		17 077	565				
Cedar		18 790	582				
Cerro Goprdo		48 580	569				
Cherokee		15 621	577				
Chickasaw		15 018	505				
Clarke		8 787	431				
Clay		19 165	569				
Clayton		21 245	778				
Clinton		55 532	695				
Crawford		19 448	714				
Dallas		29 750	591				

STATE OF IOWA (Continued)

COUNTY	VERY HIGH RISK POPULATION	AREA	HIGH RISK POPULATION	AREA	MEDIUM RISK POPULATION	AREA	LOW RISK POPULATION	AREA
Davis		9 276	504				
Decatur		9 232	535				
Delaware		19 169	578				
Des Moines		44 964	414				
Dickinson		15 710	381				
Dubuque		91 209	607				
Emmet		12 838	394				
Fayette		24 668	731				
Floyd		18 980	502				
Franklin		12 521	583				
Fremont		9 238	515				
Greene		11 579	571				
Grundy		13 743	501				
Guthrie		11 507	590				
Hamilton		17 290	576				
Hancock		13 559	571				
Hardin		21 564	569				
Harrison		15 855	698				
Henry		18 755	436				
Howard		10 877	473				
Humboldt		11 972	437				
Ida		8 852	432				
Iowa		15 135	587				
Jackson		22 405	638				
Jasper		36 039	731				
Jefferson		16 445	440				
Johnson		85 664	614				
Jones		20 530	576				
Keokuk		12 511	580				
Kossuth		21 303	974				

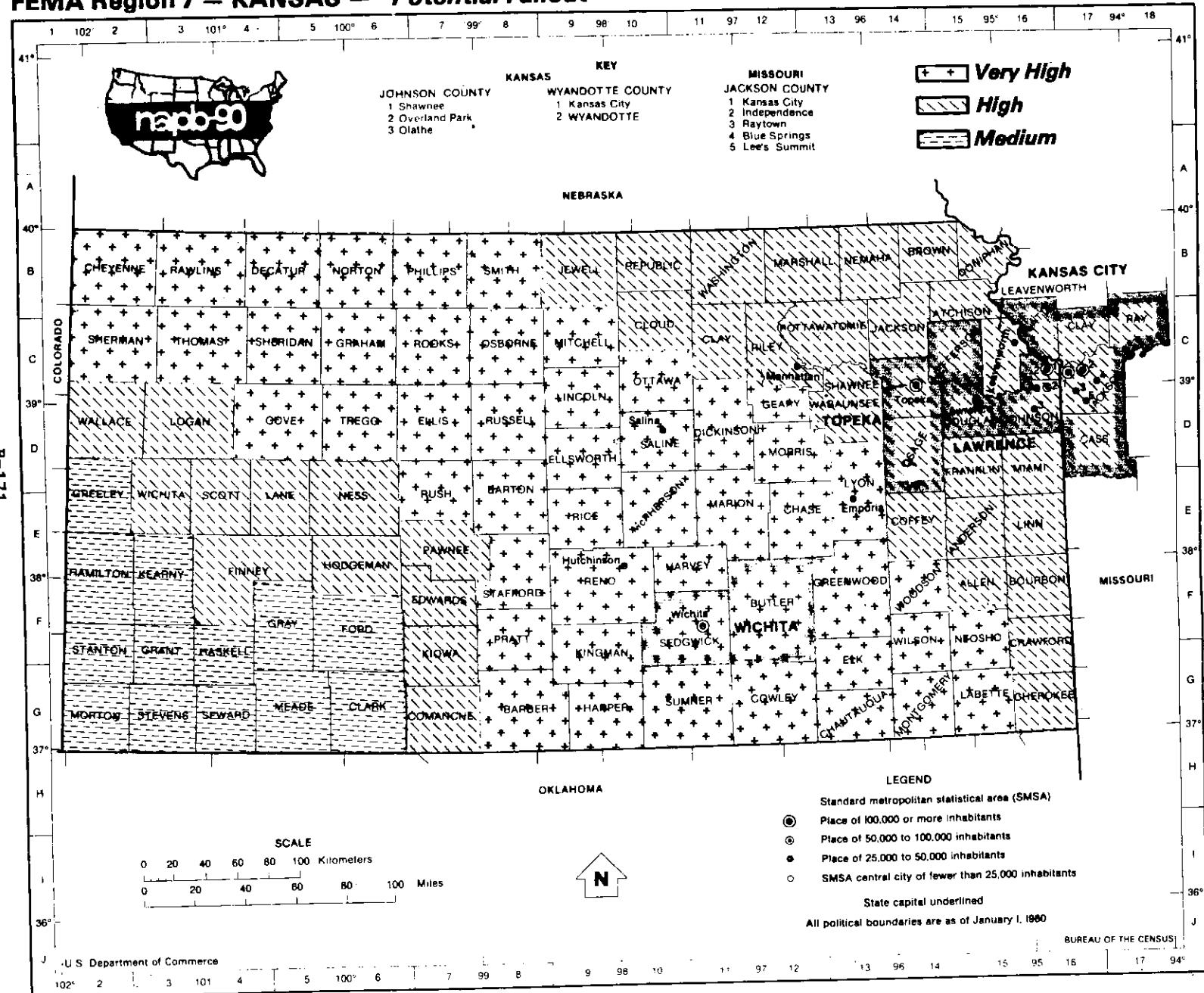
STATE OF IOWA (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Lee		42 782	522				
Linn		169 437	724				
Louisa		12 205	402				
Lucas		10 127	432				
Lyon		12 755	588				
Madison		12 297	563				
Mahaska		23 124	571				
Marion		30 300	560				
Marshall		41 544	573				
Mills		13 842	439				
Mitchell		11 817	469				
Monona		11 292	697				
Monroe		8 779	434				
Montgomery		13 273	424				
Muscatine		42 285	442				
OBrien		16 817	572				
Osceola		8 173	398				
Page		18 930	535				
Palo Alto		12 148	562				
Plymouth		24 479	864				
Pocahontas		10 841	577				
Polk		313 620	582				
Pottawattamie		88 306	953				
Poweshiek		18 716	585				
Ringgold		5 797	536				
Sac		13 394	576				
Scott		161 427	459				
Shelby		14 675	591				
Sioux		31 399	769				
Story		73 036	574				

STATE OF IOWA (Continued)

COUNTY	VERY HIGH RISK	HIGH RISK	MEDIUM RISK	LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION
Tama	18 964	722		
Taylor	8 297	537		
Union	13 855	426		
Van Buren	8 281	484		
Wapello	39 386	434		
Warren	35 956	573		
Washington	20 041	570		
Wayne	7 837	527		
Webster	43 236	718		
Winnebago	12 850	401		
Winneshiek	22 264	690		
Woodbury	101 027	873		
Worth	8 906	401		
Wright	15 861	578		
TOTAL STATE	---	2 906 939	55 964	---	---

FEMA Region 7 — KANSAS — Potential Fallout



S T A T E O F K A N S A S - - F A L L O U T R I S K

Estimated 1985 Population: 2,454,933
 Land Area: 81,792 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Allen	16 160	505				
Anderson		8 867	583				
Atchison		17 964	431				
Barber		7 351	1 136				
Barton	33 523	895						
Bourbon		15 817	638				
Brown		11 663	571				
Butler	47 629	1 443						
Chase	3 324	777						
Chautauqua	4 937	644						
Cherokee		22 307	590				
Cheyenne	3 687	1 021						
Clark				2 726	976		
Clay		9 546	632				
Cloud		12 024	718				
Coffey		10 139	615				
Comanche		2 592	790				
Cowley	37 379	1 128						
Crawford		38 049	595				
Decatur	4 658	894						
Dickinson	19 972	852						
Doniphan		9 005	388				
Douglas		70 265	461				
Edwards		4 107	620				
Elk	3 635	650						

STATE OF KANSAS (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Ellis	29 004	900						
Ellsworth	6 362	717						
Finney		30 041	1 302				
Ford				26 636	1 099		
Franklin		22 337	577				
Geary	29 329	377						
Gove	3 688	1 072						
Graham	4 256	898						
Grant				6 782	575		
Gray				5 373	868		
Greeley				1 917	778		
Greenwood	8 732	1 135					2 499	998
Hamilton							
Harper	7 767	802						
Harvey	31 144	541						
Haskell				3 876	578		
Hodgeman		2 265	860				
Jackson		11 502	658				
Jefferson		16 072	536				
Jewell		4 396	916				
Johnson		302 948	478				
Kearny				3 901	868		
Kingman	9 141	866						
Kiowa		4 011	723				
Labette	25 690	653						
Lane		2 560	717				
Leavenworth		58 999	463				
Lincoln	3 771	720						
Linn		8 342	601				
Logan		3 458	1 073				

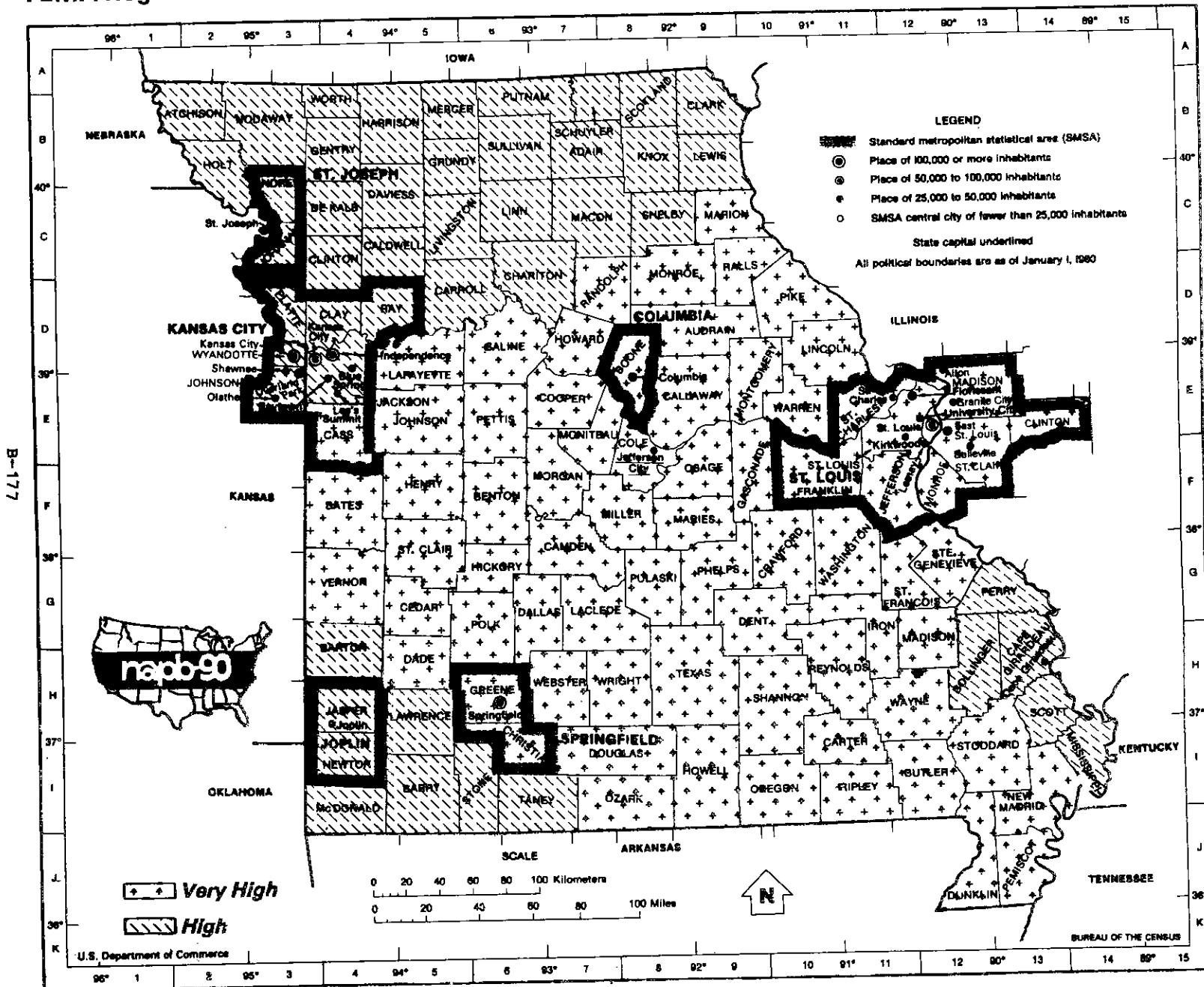
STATE OF KANSAS (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Lyon	38 382	844						
McPherson	27 785	900						
Marion	13 316	944						
Marshall		13 157	878				
Meade		4 652	979		
Miami		22 370	590				
Mitchell	7 879	717						
Montgomery	42 372	646						
Morris	6 294	693						
Morton		3 551	731		
Nemaha		11 148	719				
Neosho	19 665	576						
Ness		4 719	1 075				
Norton	6 530	873						
Osage		16 345	695				
Osborne	5 677	882						
Ottawa	5 823	721						
Pawnee		8 369	755				
Phillips	7 276	887						
Pottawatomie		15 954	828				
Pratt		11 255	735				
Rawlins	3 990	1 069						
Reno	64 889	1 259						
Republic		7 034	719				
Rice	11 669	728						
Riley		63 181	593				
Rooks	6 958	888						
Rush	4 427	718						
Russell	9 344	869						
Saline	50 557	721						

STATE OF KANSAS (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Scott		5 905	717				
Sedgwick	385 098	1 007			18 408	640		
Seward							
Shawnee		160 006	549				
Sheridan	3 435	896						
Sherman	7 425	1 057						
Smith	5 576	897						
Stafford		5 886	788			2 451	681
Stanton						4 863	727
Stevens							
Sumner	25 457	1 184						
Thomas	9 160	1 075						
Trego	4 428	890						
Wabaunsee		6 775	797				
Wallace		2 075	914				
Washington		7 890	898				
Wichita		2 684	719				
Wilson	11 722	575						
Woodson	4 657	498						
Wyandotte		172 339	149				
TOTAL STATE	1 107 419	39 999	1 259 879	31 295	87 635	10 498	---	---

FEMA Region 7 – MISSOURI – *Potential Fallout*



S T A T E O F M I S S O U R I -- F A L L O U T R I S K

Estimated 1985 Population: 4,968,558
 Land Area: 68,576 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Adair		25 447	567				
Andrew		15 285	436				
Atchison		8 640	542				
Audrain	25 774	697						
Barry		26 082	773				
Barton		11 620	597				
Bates	15 991	849						
Benton	12 507	729						
Bollinger		10 414	621				
Boone	107 479	687						
Buchanan		86 001	409				
Butler	38 514	698						
Caldwell		8 099	431				
Callaway	33 202	542						
Camden	23 226	641						
Cape Girardeau		60 804	577				
Carroll		11 543	695				
Carter	5 705	509						
Cass	55 154	702						
Cedar	12 412	471						
Chariton		10 258	758				
Christian	24 655	564						
Clark		8 254	507				
Clay		138 910	403				
Clinton		16 139	423				

STATE OF MISSOURI (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Cole	61 687	392						
Cooper	14 592	566						
Crawford	19 043	744						
Dade	7 533	491						
Dallas	12 760	543						
Daviess		8 648	568				
DeKalb		8 127	425				
Dent	14 934	755						
Douglas	12 608	814						
Dunklin	35 924	547						
Franklin	74 755	922						
Gasconade	13 677	521						
Gentry		7 919	493				
Greene	194 885	678						
Grundy		11 542	437				
Harrison		9 919	725				
Henry	19 582	729						
Hickory	7 044	379						
Holt		6 649	456				
Howard	9 972	464						
Howell	30 461	927						
Iron	11 542	552						
Jackson		634 530	611				
Jasper		89 889	641				
Jefferson	158 515	661						
Johnson	38 244	834						
Knox		5 277	507				
LaClede	26 106	768						
LaFayette	30 315	632						
Lawrence		30 322	614				

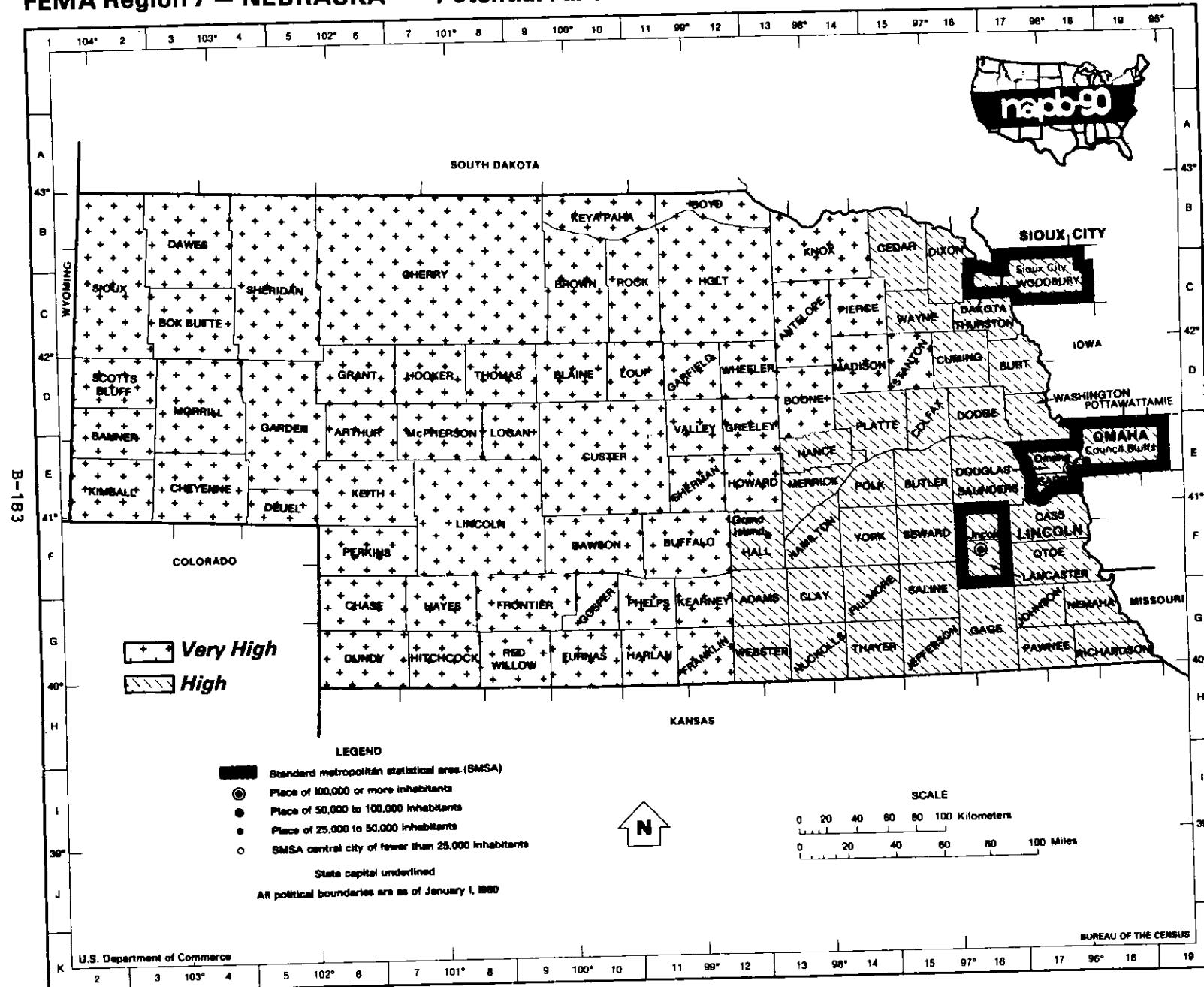
STATE OF MISSOURI (Continued)

COUNTY	VERY HIGH RISK POPULATION AREA		HIGH RISK POPULATION AREA		MEDIUM RISK POPULATION AREA		LOW RISK POPULATION AREA	
Lewis		11	165	508			
Lincoln	24	138	627					
Linn		15	542	620			
Livingston		15	532	537			
McDonald		15	830	541			
Macon		17	010	797			
Madison	11	008	497					
Maries	7	896	528					
Marion	29	304	438					
Mercer		4	597	454			
Miller	20	308	593					
Mississippi		15	770	410			
Moniteau		12	906	417			
Monroe	9	699	670					
Montgomery	11	566	540					
Morgan	15	540	594					
New Madrid	22	345	658					
Newton		43	026	627			
Nodaway		22	573	875			
Oregon	10	036	792					
Osage	12	200	606					
Ozark	8	858	731					
Pemiscot	24	155	517					
Perry		17	125	473			
Pettis	35	726	686					
Phelps	35	514	674					
Pike	16	953	673					
Platte		49	863	421			
Polk	20	220	636					
Pulaski	44	051	550					

STATE OF MISSOURI (Continued)

COUNTY	VERY HIGH RISK POPULATION	AREA	HIGH RISK POPULATION	AREA	MEDIUM RISK POPULATION	AREA	LOW RISK POPULATION	AREA
Putnam		5 858	520				
Ralls	9 076	481						
Randolph	26 165	477						
Ray		21 878	568				
Reynolds	7 162	808						
Ripley	12 767	632						
St Charles	166 248	558						
St Clair	8 667	698						
Ste Genevieve	15 238	504						
St Francois	43 670	451						
St Louis	990 381	505						
Saline	25 067	755						
Schuylerville		4 721	308				
Scotland		5 278	439				
Scott		40 428	423				
Shannon	8 095	1 004						
Shelby		7 652	501				
Stoddard	28 536	818						
Stone		17 337	451				
Sullivan		7 134	651				
Taney		24 151	608				
Texas	21 640	1 108						
Vernon	19 850	837						
Warren	16 799	429						
Washington	18 661	762						
Wayne	11 804	763						
Webster	21 915	594						
Worth		2 968	266				
Wright	16 431	682						
St Louis (City)	423 409	61						
TOTAL STATE	3 339 896	43 945	1 628 662	24 631	---	---	---	---

FEMA Region 7 — NEBRASKA — Potential Fallout



S T A T E O F N E E B R A S K A -- F A L L O U T R I S K

Estimated 1985 Population: 1,614,811
 Land Area: 76,639 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Adams		31 141	564				
Antelope	8 726	859						
Arthur	475	710						
Banner	1 084	747						
Blaine	775	714						
Boone	7 343	687						
Box Butte	14 324	1 077						
Boyd	3 325	532						
Brown	4 287	1 214						
Buffalo	38 764	946						
Burt		8 741	486				
Butler		9 138	584				
Cass		21 808	557				
Cedar		11 255	740				
Chase	4 924	893						
Cherry	6 867	5 961						
Cheyenne	10 046	1 196						
Clay		7 815	574				
Colfax		9 545	410				
Cuming		11 447	575				
Custer	13 677	2 571						
Dakota		17 369	258				
Dawes	9 362	1 397						
Dawson	22 298	982						
Deuel	2 358	437						

STATE OF NEBRASKA (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Dixon		6 864	474				
Dodge		35 764	534				
Douglas		413 626	333				
Dundy	2 894	920						
Fillmore		7 732	576				
Franklin	4 293	576						
Frontier	3 632	976						
Furnas	6 536	721						
Gage		23 940	858				
Garden	2 725	1 680						
Garfield	2 422	570						
Gosper	2 160	461						
Grant	878	775						
Greeley	3 320	570						
Hall		50 376	537				
Hamilton		9 232	542				
Harlan	4 288	555						
Hayes	1 316	714						
Hitchcock	3 965	709						
Holt	14 004	2 406						
Hooker	1 024	720						
Howard	6 707	564						
Jefferson		9 535	575				
Johnson		5 057	376				
Kearney	6 690	519						
Keith	9 138	1 039						
Keya Paha	1 237	769						
Kimball	4 967	952						
Knox	11 198	1 105						
Lancaster		205 512	839				

STATE OF NEBRASKA (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Lincoln	34 217	2 525						
Logan	969	571						
Loup	897	574						
McPherson	561	859						
Madison	32 468	575						
Merrick		8 628	478				
Morril	6 029	1 405						
Nance		4 594	439				
Nemaha		8 330	408				
Nuckolls		6 792	576				
Otoe		15 120	615				
Pawnee		3 695	432				
Perkins	3 813	885						
Phelps	10 198	540						
Pierce	8 514	575						
Platte		29 752	669				
Polk		5 973	437				
Red Willow	12 999	718						
Richardson		10 905	553				
Rock	2 456	1 003						
Saline		13 066	576				
Sarpy		95 470	238				
Saunders		18 574	753				
Scotts Bluff	38 419	725						
Seward		15 820	575				
Sheridan	7 807	2 453						
Sherman	3 972	564						
Sioux	1 738	2 069						
Stanton	6 437	431						
Thayer		7 463	575				

STATE OF NEBRASKA (Continued)

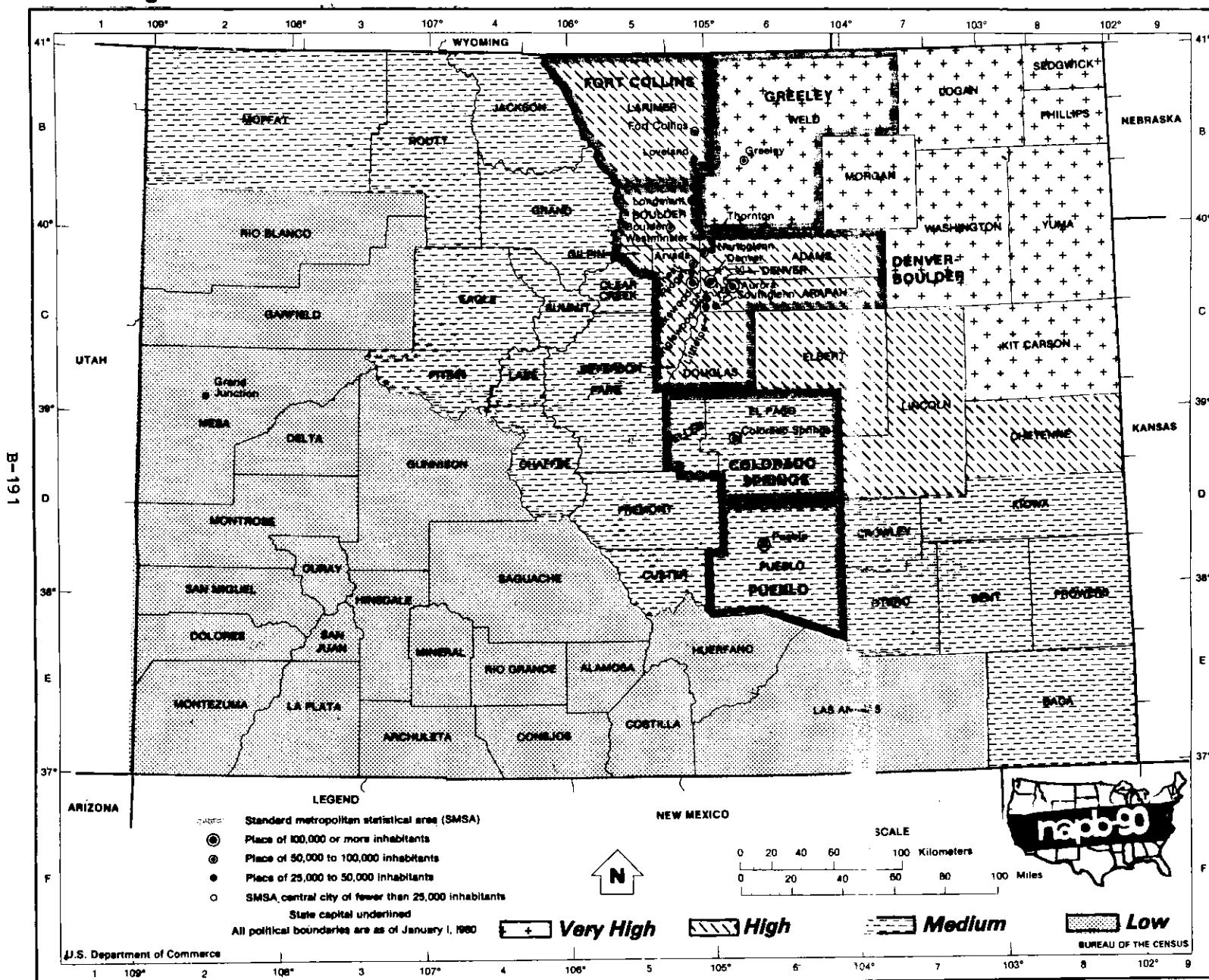
COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Thomas	965	714						
Thurston	7 194	391						
Valley	5 871	567						
Washington		15 464	386				
Wayne		9 801	443				
Webster		4 787	575				
Wheeler	1 101	575						
York		15 046	576				
TOTAL STATE	429 634	56 943	1 185 177	19 696	---	---	---	---

F E M A R E G I O N V I I I - - F A L L O U T R I S K S U M M A R Y

Estimated 1985 Population: 7,709,731
 Land Area: 573,497 square miles

STATE	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Colorado	208 479	15 358	2 022 824	13 470	679 583	32 058	339 232	42 766
Montana	521 557	97 043	99 708	25 565	211 607	22 757	---	---
North Dakota	563 779	50 678	133 797	18 666	---	---	---	---
South Dakota	232 028	39 459	476 700	36 497	---	---	---	---
Utah	---	---	167 391	1 169	1 021 379	13 537	510 097	67 388
Wyoming	95 053	7 073	258 778	45 559	167 739	44 454	---	---
TOTAL REGION VIII	1 620 896	209 611	3 159 198	140 926	2 080 308	112 806	849 329	111 154

FEMA Region 8 – COLORADO – *Potential Fallout*



S T A T E O F C O L O R A D O -- F A L L O U T R I S K

Estimated 1985 Population: 3,250,118
 Land Area: 103,652 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Adams	277 973	1 235						
Alamosa							12 588	719
Arapahoe	378 836	800						
Archuleta							5 798	1 353
Baca			5 133	2 554				
Bent			5 913	1 008				
Boulder	213 665	742						
Chaffee			12 793	1 008				
Chjeyenne	2 475	1 783						
Clear Creek							7 283	397
Conejos							8 148	1 285
Costilla							3 564	1 227
Crowley			3 282	790				
Custer			1 952	740				
Delta							24 615	1 141
Denver	507 548	111						
Dolores							1 792	1 064
Douglas	35 853	841						
Eagle			17 085	1 690				
Elbert	8 500	1 851						
El Paso			358 941	2 129				
Fremont			31 488	1 538				
Garfield							28 651	2 952
Gilpin	2 822	149						
Grand			9 077	1 854				

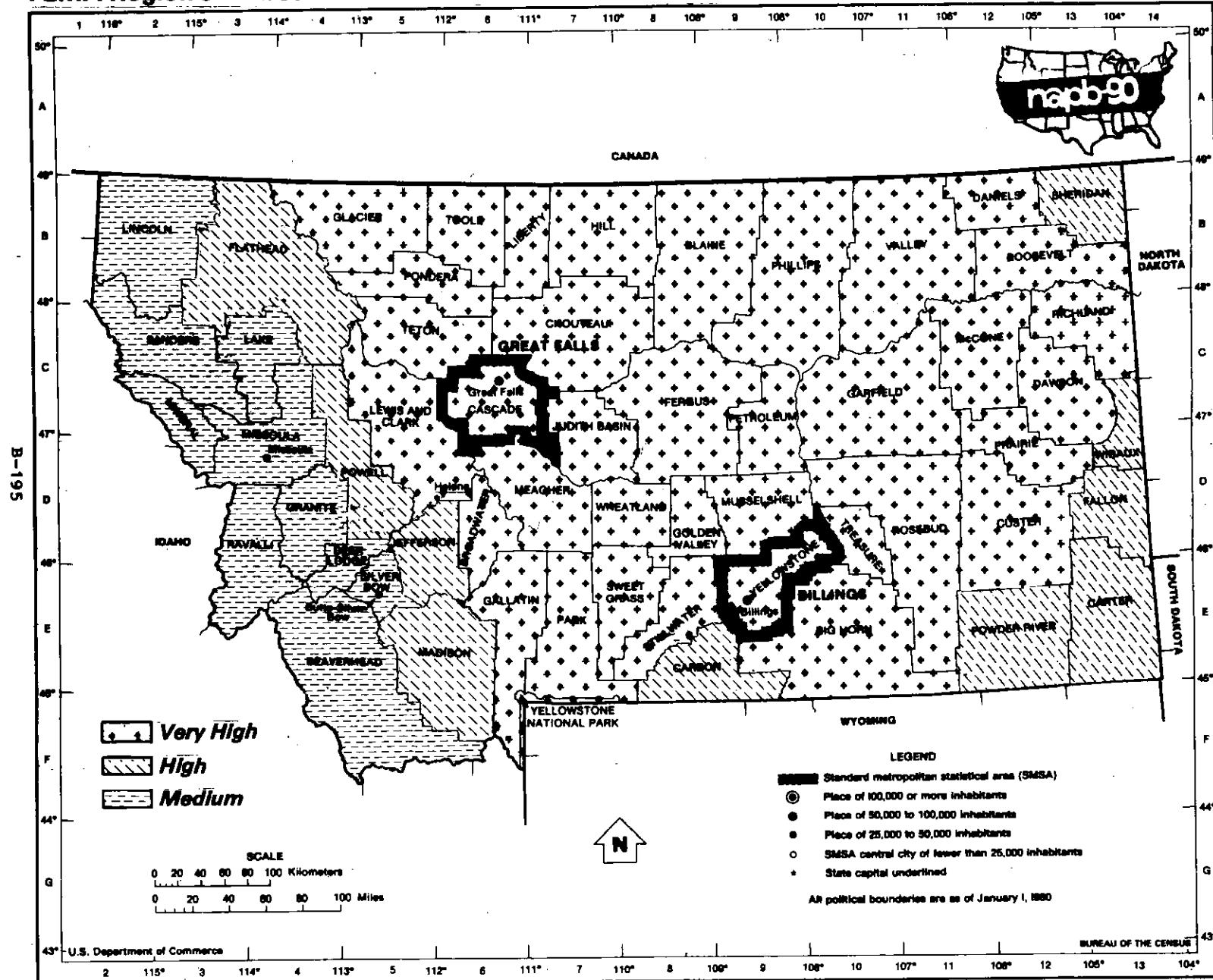
STATE OF COLORADO (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Gunnison							10 471	3 238
Hinsdale							531	1 115
Huerfano							7 187	1 583
Jackson					1 732	1 615		
Jefferson		420 750	1 615					
Kiowa					1 947	1 758		
Kit Carson	7 960	2 160						
Lake					6 762	379		
La Plata							31 744	1 692
Larimer		169 855	2 604					
Las Animas							14 778	4 771
Lincoln		4 547	2 586					
Logan	19 921	1 819						
Mesa							98 752	3 309
Mineral							808	877
Moffat				15 593	4 732			
Montezuma							20 001	2 083
Montrose							26 409	2 240
Morgan	23 440	1 276						
Otero				22 191	1 247			
Ouray							2 241	542
Park							7 201	2 192
Phillips	4 653	688						
Pitkin				10 356	968			
Prowers				14 492	1 629			
Pueblo				124 546	2 377			
Rio Blanco							6 960	3 222
Rio Grande							11 468	913
Routt				13 951	2 267			
Saguache							4 141	3 176

STATE OF COLORADO (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
San Juan						1 085	388
San Miguel						3 006	1 287
Sedgwick	3 187	540						
Summit				11 192	607		
Teller				11 157	559		
Washington	5 548	2 520						
Weld	133 779	3 990						
Yuma	9 991	2 365						
TOTAL STATE	208 479	15 358	2 022 824	13 470	679 583	32 058	339 232	42 766

FEMA Region 8 — MONTANA — Potential Fallout



STATE OF MONTANA -- FALLOUT RISK

Estimated 1985 Population: 832,872
 Land Area: 145,365 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Beaverhead						8 849	5 529
Big Horn	11 639	4 983						
Blaine	7 056	4 259						
Broadwater	3 459	1 188						
Carbon		8 734	2 056				
Carter		1 751	3 342				
Cascade	82 077	2 699						
Chouteau	6 186	3 988						
Custer	13 535	3 776						
Daniels	2 758	1 427						
Dawson	12 939	2 347						
Deer Lodge						10 873	740
Fallon		3 767	1 623				
Fergus	12 880	4 340						
Flathead		54 349	5 112				
Gallatin	48 749	2 510						
Garfield	1 704	4 491						
Glacier	11 450	2 995						
Golden Valley	1 114	1 172						
Granite						2 841	1 729
Hill	18 678	2 897						
Jefferson		8 286	1 656				
Judith Basin	2 716	1 871						
Lake						20 728	1 493
Lewis and Clark	46 434	3 461						

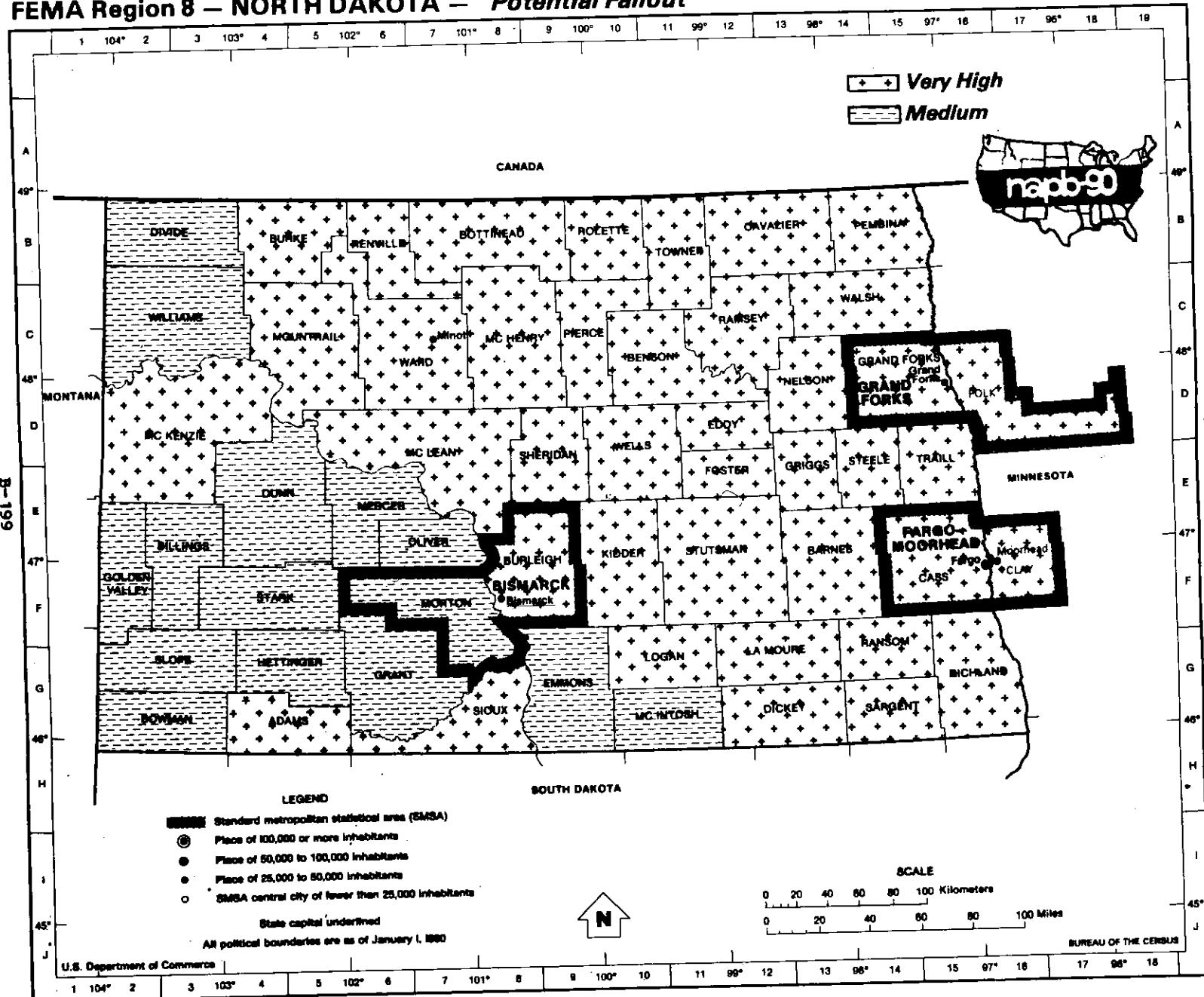
STATE OF MONTANA (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Liberty	2 597	1 427						
Lincoln			18 885	3 616		
McCone	2 703	2 626						
Madison	5 933	3 590				
Meagher	2 247	2 392						
Mineral			3 694	1 216		
Missoula			76 535	2 582		
Musselshell	4 373	2 665						
Park	13 373	2 665						
Petroleum	676	1 652						
Phillips	5 756	5 131						
Pondera	7 155	1 632						
Powder River	2 471	3 288				
Powell	6 849	2 329				
Prairie	1 873	1 732						
Ravalli			25 404	2 384		
Richland	14 890	2 081						
Roosevelt	11 848	2 357						
Rosebud	13 959	5 019						
Sanders			9 326	2 749		
Sheridan	6 072	1 681				
Silver Bow			34 471	719		
Stillwater	6 114	1 793						
Sweetgrass	3 321	1 856						
Teton	6 424	2 275						
Toole	5 784	1 931						
Treasure	1 019	975						
Valley	9 916	4 936						
Wheatland	2 291	1 419						
Wibaux	1 496	888				

STATE OF MONTANA (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Yellowstone	121 398	2 624						
Yellowstone National	66	245						
TOTAL STATE	521 557	97 043	99 708	25 565	211 607	22 757	---	---

FEMA Region 8 – NORTH DAKOTA – Potential Fallout



STATE OF NORTH DAKOTA -- FALLOUT RISK

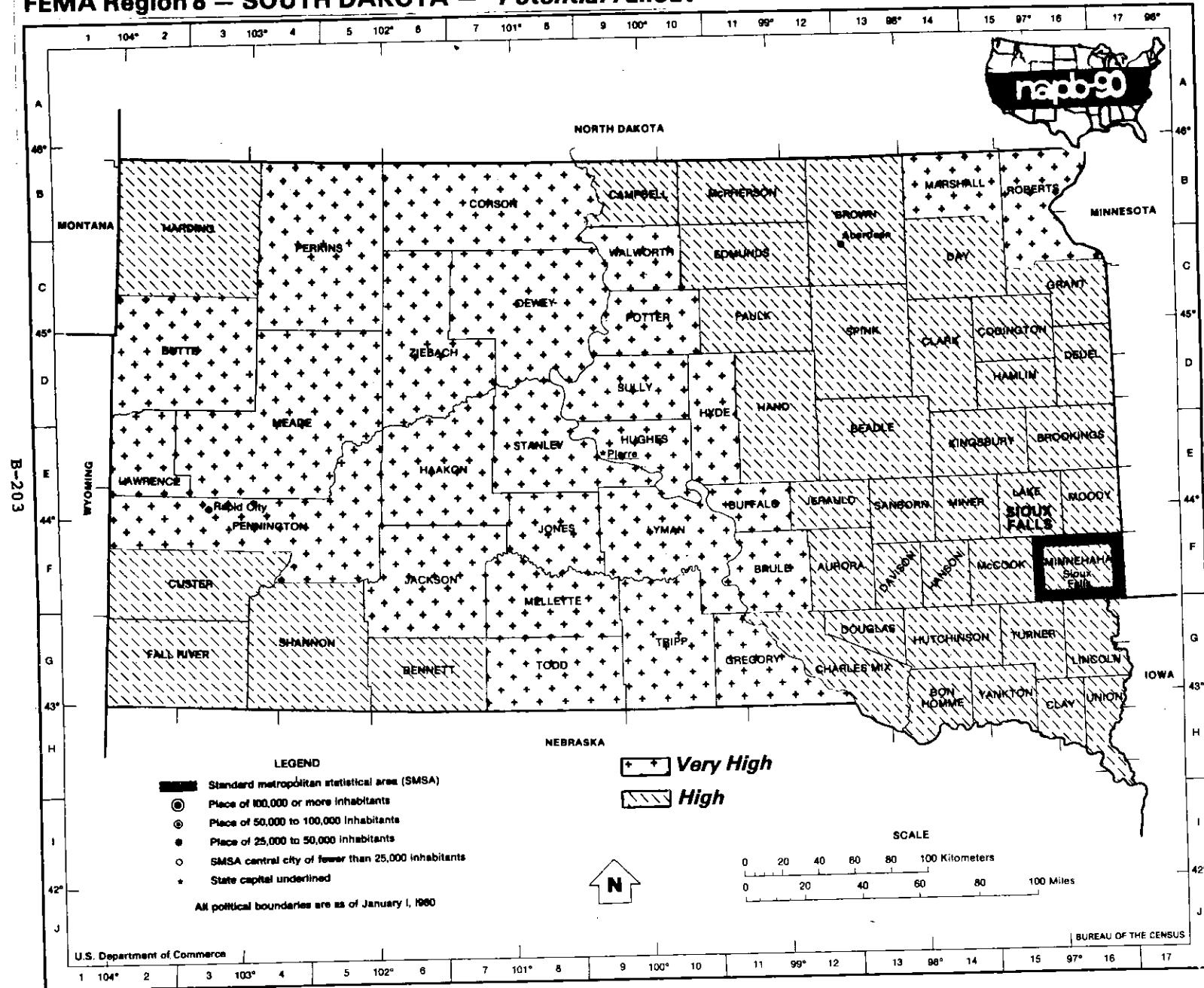
Estimated 1985 Population: 697,576
 Land Area: 69,344 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 600R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Adams	3 494	988						
Barnes	13 666	1 498						
Benson	8 099	1 412						
Billings		1 332	1 152				
Bottineau	9 120	1 668						
Bowman		4 334	1 162				
Burke	3 655	1 118						
Burleigh	60 173	1 618						
Cass	97 117	1 767						
Cavalier	7 029	1 507						
Dickey	6 876	1 139						
Divide		3 200	1 288				
Dunn		5 380	1 993				
Eddy	3 230	634						
Emmons	5 692	1 499						
Foster	4 564	640						
Golden Valley		2 688	1 003				
Grand Forks	69 331	1 440						
Grant		4 147	1 660				
Griggs	3 631	780						
Hettinger		3 954	1 133				
Kidder	3 777	1 362						
La Moure	6 037	1 150						
Logan	3 203	1 000						
McHenry	7 432	1 887						

STATE OF NORTH DAKOTA (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
McIntosh		4 406	984				
McKenzie	8 890	2 754						
McLean	13 042	2 065						
Mercer		16 279	1 044				
Morton		27 044	1 920				
Mountrail	8 188	1 837						
Nelson	4 946	991						
Oliver		2 724	723				
Pembina	10 129	1 120						
Pierce	5 998	1 037						
Ramsey	13 031	1 241						
Ransom	6 452	862						
Renville	3 555	874						
Richland	20 230	1 436						
Rolette	13 300	914						
Sargent	5 186	858						
Sheridan	2 606	990						
Sioux	3 753	1 099						
Slope		1 148	1 219				
Stark		28 911	1 338				
Steele	2 896	714						
Stutsman	23 547	2 263						
Towner	4 752	1 036						
Traill	9 285	861						
Walsh	15 579	1 290						
Ward	65 495	2 041						
Wells	6 793	1 288						
Williams		28 270	2 047				
TOTAL STATE	563 779	50 678	133 797	18 666	---	---	---	---

FEMA Region 8 – SOUTH DAKOTA – *Potential Fallout*



STATE OF SOUTH DAKOTA -- FALLOUT RISK

Estimated 1985 Population: 708,728
 Land Area: 75,956 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Aurora		3 435	707				
Beadle		18 136	1 259				
Bennett		3 313	1 181				
Bon Homme		7 814	552				
Brookings		25 165	795				
Brown		36 712	1 722				
Brule	5 408	815						
Buffalo	1 685	476						
Butte	8 125	2 251						
Campbell		2 274	732				
Charles Mix		9 719	1 090				
Clark		4 950	953				
Clay		13 647	408				
Codington		22 368	695				
Corson	5 243	2 467						
Custer		6 795	1 559				
Davison		17 806	436				
Day		7 893	1 022				
Deuel		5 203	631				
Dewey	5 487	2 310						
Douglas		3 894	434				
Edmunds		4 933	1 149				
Fall River		7 820	1 740				
Faulk		3 312	1 003				
Grant		9 582	681				

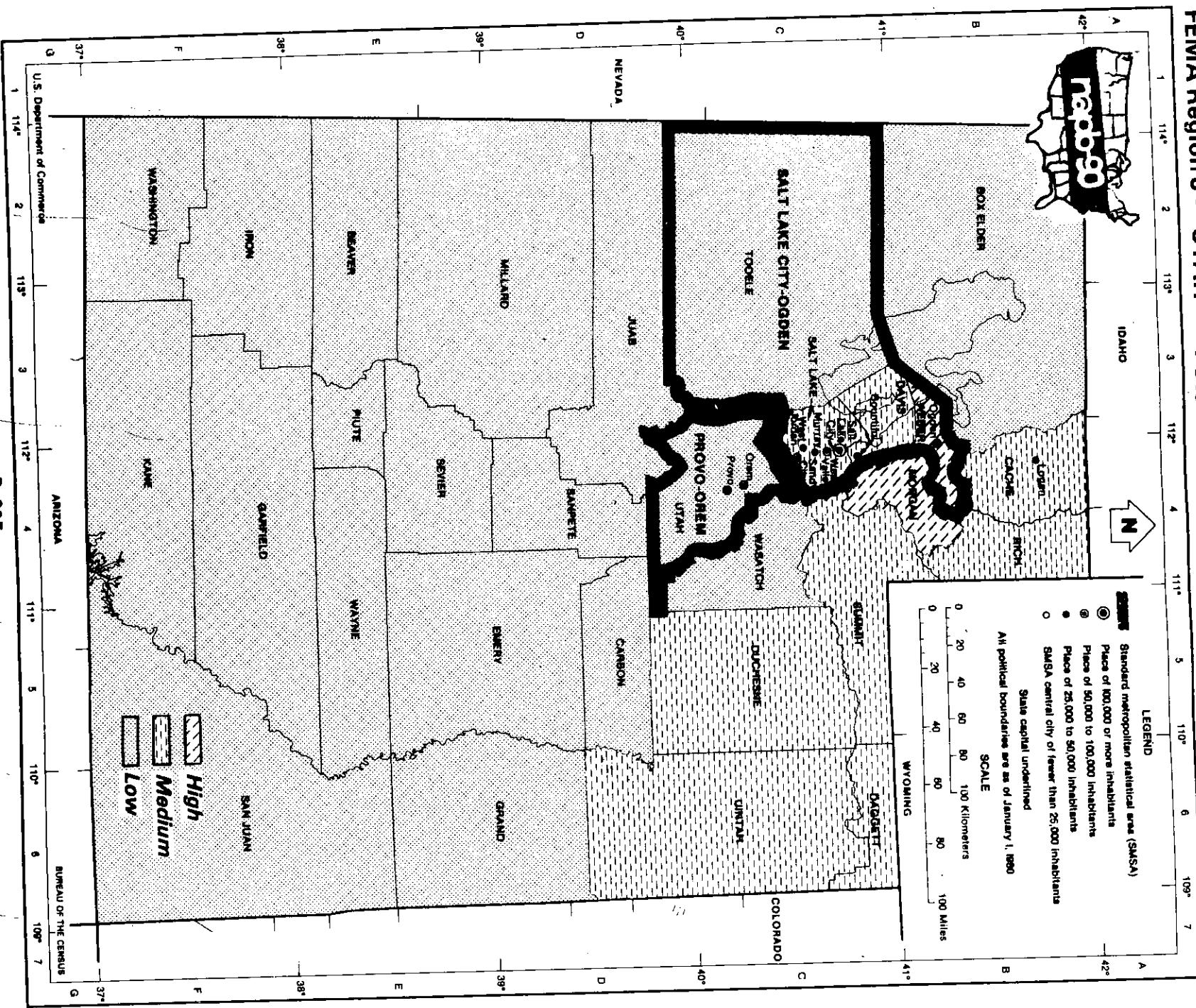
STATE OF SOUTH DAKOTA (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Gregory	5 871	1 041						
Haakon	2 965	1 822						
Hamlin		5 251	512				
Hand		4 701	1 437				
Hanson		3 290	433				
Harding		1 889	2 678				
Hughes	14 830	757						
Hutchinson		9 045	816				
Hyde	1 909	860						
Jackson	3 266	1 872						
Jerauld		2 728	530				
Jones	1 500	971						
Kingsbury		6 493	824				
Lake		11 002	560				
Lawrence	19 380	800						
Lincoln		14 384	578				
Lyman	3 892	1 679						
McCook		6 234	576				
McPherson		3 766	1 148				
Marshall	5 209	848						
Meade	21 716	3 481						
Mellette	2 365	1 311						
Miner		3 482	570				
Minnehaha		120 296	810				
Moody		6 964	520				
Pennington	75 780	2 783						
Perkins	4 649	2 885						
Potter	3 715	869						
Roberts	11 063	1 102						
Sanborn		3 093	569				

STATE OF SOUTH DAKOTA (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Shannon		11 207	2 094				
Spink		9 081	1 505				
Stanley	2 451	1 432						
Sully	1 868	972						
Todd	7 256	1 388						
Tripp	7 188	1 618						
Turner		9 126	617				
Union		10 774	453				
Walworth	6 624	707						
Yankton		19 123	518				
Ziebach	2 493	1 969						
TOTAL STATE	232 028	39 459	476 700	36 497	---	---	---	---

FEMA Region 8 – UTAH – "Potential Fallout Threat"



STATE OF UTAH -- FALLOUT RISK

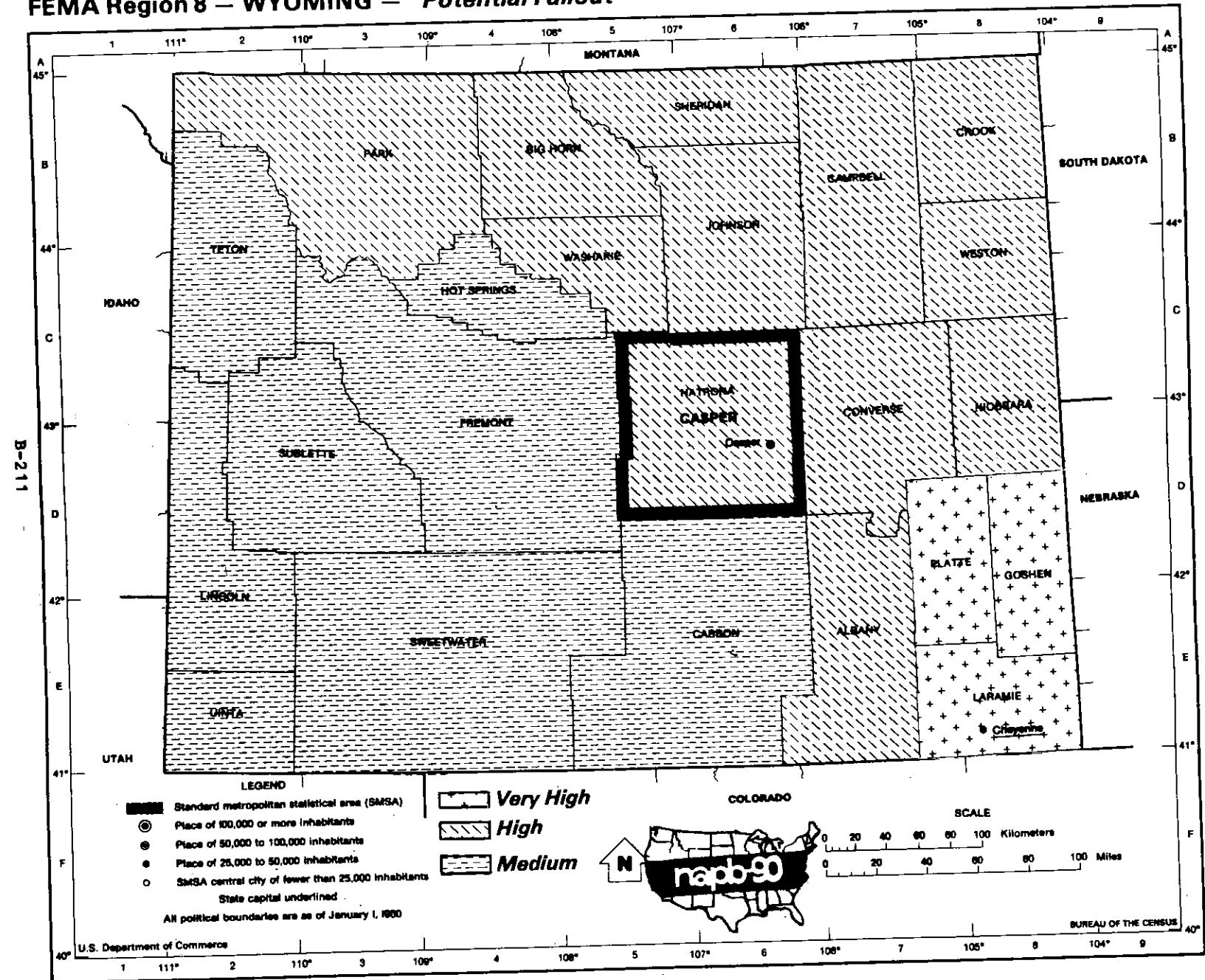
Estimated 1985 Population: 1,698,867
 Land Area: 82,094 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Beaver							5 280	2 586
Box Elder							37 769	5 614
Cache					66 658	1 171		
Carbon							26 132	1 479
Daggett					856	699		
Davis					174 969	299		
Duchesne					16 271	3 234		
Emery							13 911	4 449
Garfield							4 319	4 449
Grand							7 957	3 689
Iron							20 357	3 302
Juab							6 274	3 396
Kane							4 509	3 898
Millard							13 762	6 818
Morgan			5 285	603				
Piute							1 476	759
Rich					2 638	1 034		
Salt Lake					716 909	756		
San Juan							12 096	7 725
Sanpete							17 343	1 586
Sevier							16 360	1 910
Summit					13 230	1 865		
Tooele							29 408	6 919
Uintah					29 848	4 479		
Utah							246 181	2 018

STATE OF UTAH (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Wasatch						10 044	1 191
Washington						34 783	2 422
Wayne						2 136	2 461
Weber		162 106	566				
TOTAL STATE	---	---	167 391	1 169	1 021 379	13 537	510 097	67 388

FEMA Region 8 — WYOMING — *Potential Fallout*



STATE OF WYOMING -- FALLOUT RISK

Estimated 1985 Population: 521,570
 Land Area: 97,086 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Albany		30 328	4 286				
Big Horn		12 559	3 139				
Campbell		37 605	4 796				
Carbon				20 407	7 878		
Converse		15 207	4 271				
Crook		6 058	2 856				
Fremont				36 886	9 181		
Goshen	12 430	2 186						
Hot Springs				6 119	2 005		
Johnson		7 107	4 166				
Laramie	73 254	2 864						
Lincoln				15 176	4 070		
Natrona		75 746	5 247				
Niobara		3 358	2 685				
Park		25 213	6 936				
Platte	9 369	2 023						
Sheridan		27 466	2 532				
Sublette				5 572	4 871		
Sweetwater				45 791	10 352		
Teton				11 553	4 012		
Uinta				26 235	2 085		
Washakie		10 106	2 243				
Weston		8 025	2 402				
TOTAL STATE	95 053	7 073	258 778	45 559	167 739	44 454	---	---

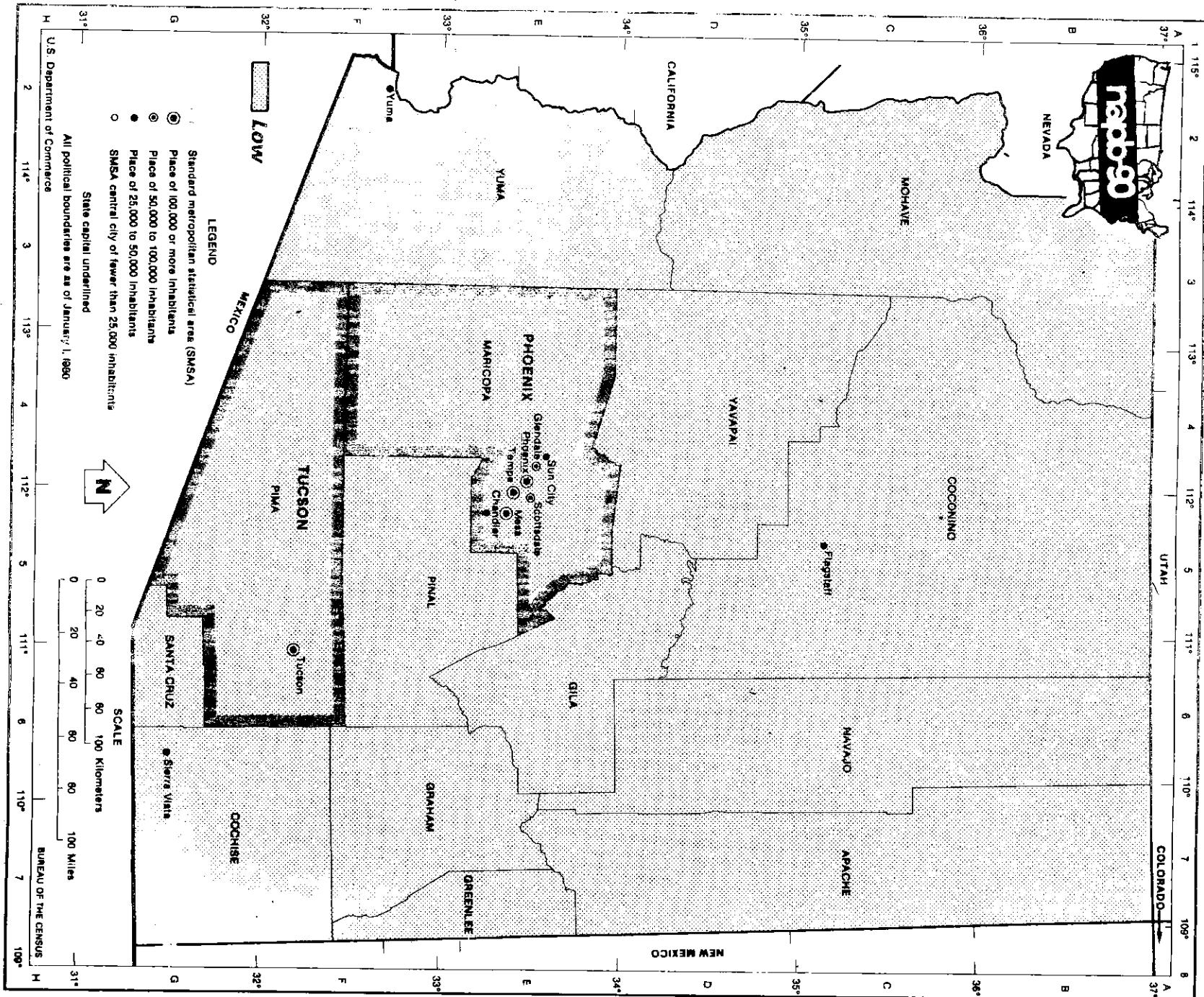
F E M A R E G I O N I X - - F A L L O U T R I S K S U M M A R Y

Estimated 1985 Population: 31,504,342
 Land Area: 386,970 square miles

STATE	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 300R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Arizona	---	---	---	---	---	---	3 138 988	113 550
California	1 351 111	20 941	14 558 057	52 204	8 881 071	39 675	1 315 605	43 459
Hawaii	---	---	---	---	---	---	1 057 270	6 427
Nevada	---	---	---	---	611 497	32 602	326 694	77 293
American Samoa	---	---	---	---	---	---	35 000*	77
Guam	---	---	---	---	---	---	112 900	209
Trust Territory	---	---	---	---	---	---	116 149*	533
TOTAL REGION IX	1 351 111	20 941	14 558 057	52 204	9 492 568	72 277	6 102 606	241 548

* 1980 Census

FEMA Region 9 — ARIZONA — Potential Flood

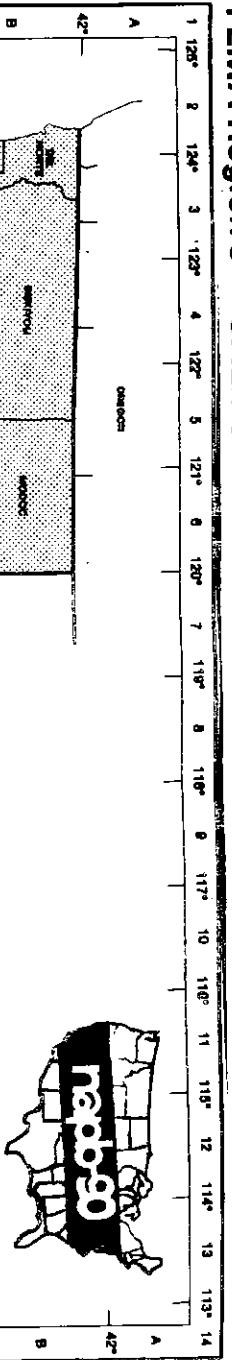


STATE OF ARIZONA -- FALLOUT RISK

Estimated 1985 Population: 3,138 988
 Land Area: 113,550 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Apache		53 418		11 211	
Cochise		95 247		6 219	
Coconino		85 381		18 608	
Gila		38 830		4 753	
Graham		23 316		4 631	
Greenlee		9 640		1 837	
Maricopa		1 766 060		9 127	
Mohave		71 818		13 285	
Navajo		72 022		9 995	
Pima		610 597		9 187	
Pinal		102 303		5 343	
Santa Cruz		21 417		1 238	
Yavapai		81 196		8 122	
Yuma		107 743		9 994	
TOTAL STATE	---		---		---		3 138 988	113 550

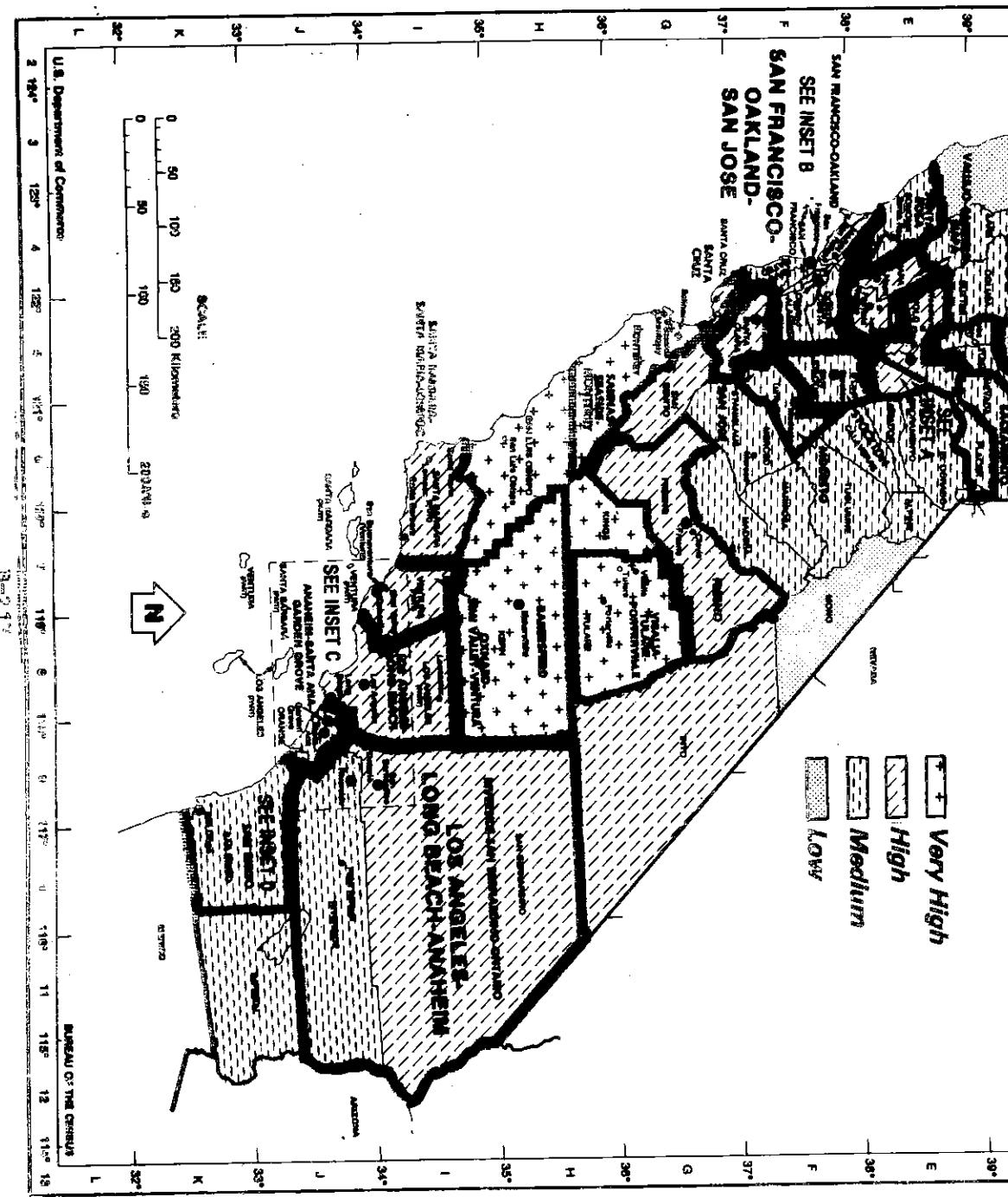
FEMA Region 9 – CALIFORNIA – Potential Fallout



LEGEND

- Standard consolidated statistical area (SMSA)
- Place of 100,000 or more inhabitants
- Place of 50,000 to 100,000 inhabitants
- Place of 25,000 to 50,000 inhabitants
- SMSA central city or fewer than 25,000 inhabitants
- State capital underlined

All political boundaries are as of January 1, 1980



U.S. Department of Commerce

BUREAU OF THE CENSUS

SCALE:
0 50 100 150 200 Kilometers
0 50 100 150 Miles



BUREAU OF THE CENSUS

1980

13-297

STATE OF CALIFORNIA -- FALLOUT RISK

Estimated 1985 Population: 26,105,844
 Land Area: 156,279 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Alameda		1 190 343		736			
Alpine		1 141		739			
Amador						22 813	589
Butte						162 165	1 646
Calaveras		26 876		1 021			
Colusa		14 543		1 153			
Contra Costa		708 382		730			
Del Norte						18 370	1 007
El Dorado		102 112		1 715			
Fresno	574 401	5 978					
Glenn						22 999	1 319
Humboldt						112 294	3 579
Imperial		104 881		4 173			
Inyo	18 372	10 223					
Kern	477 128	8 130						
Kings	83 706	1 392						
Lake		47 940		1 262			
Lassen							
Los Angeles	8 006 962	4 070				24 433	4 553
Madera		76 585		2 145			
Marin	224 538	523					
Mariposa		13 230		1 456			
Mendocino		159 970		1 944		72 881	3 512
Merced							
Modoc						9 810	4 046

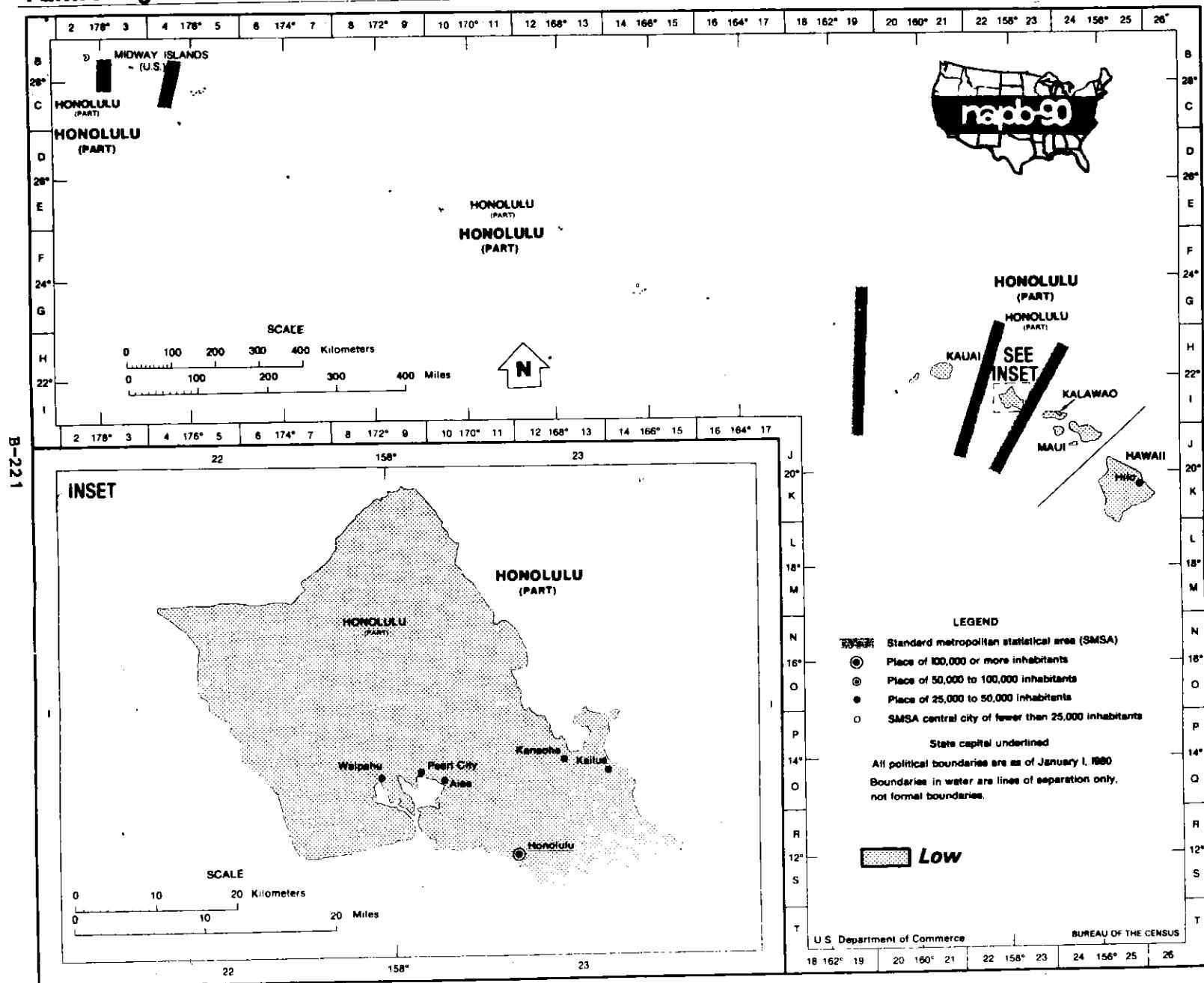
STATE OF CALIFORNIA (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Mono						9 243	3 019
Monterey	326 370	3 303						
Napa		102 667	744				
Nevada				68 276	960		
Orange				2 111 396	798		
Placer				137 111	1 416		
Plumas						18 745	2 573
Riverside				805 521	7 214		
Sacramento		887 649	971				
San Benito		30 158	1 388				
San Bernardino		1 068 239	20 064				
San Diego				2 114 283	4 212		
San Francisco		721 187	46				
San Joaquin				411 407	1 415		
San Luis Obispo	184 867	3 308						
San Mateo						609 317	447
Santa Barbara		328 764	2 748				
Santa Clara		1 390 579	1 293				
Santa Cruz		210 206	446				
Shasta						129 180	3 786
Sierra						3 403	959
Siskiyou						42 324	6 281
Soland		273 235	834				
Sonoma				332 912	1 604		
Stanislaus				303 105	1 506		
Sutter				58 181	602		
Tehama						44 142	2 953
Trinity						13 486	3 190
Tulare	279 040	4 808						
Tuolumne				39 613	2 234		

STATE OF CALIFORNIA (Continued)

COUNTY	VERY HIGH RISK POPULATION	AREA	HIGH RISK POPULATION	AREA	MEDIUM RISK POPULATION	AREA	LOW RISK POPULATION	AREA
Ventura		598 564	1 862				
Yolo		122 536	1 014				
Yuba				53 263	640		
TOTAL STATE	1 351 111	20 941	14 558 057	52 204	8 881 071	39 675	1 315 605	43 459

FEMA Region 9— HAWAII — Potential Fallout

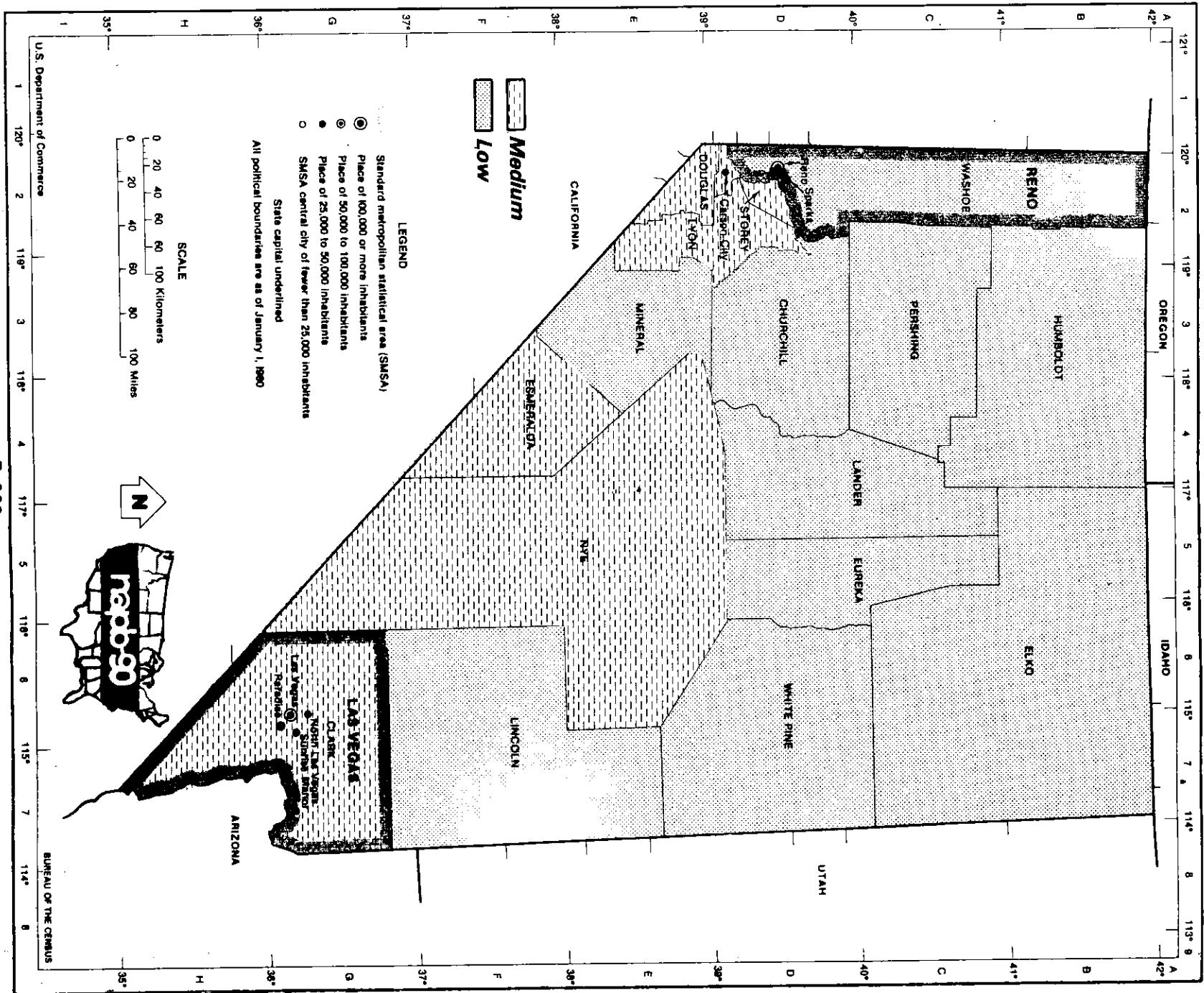


STATE OF HAWAII -- FALLOUT RISK

Estimated 1985 Population: 1,057,270
Land Area: 6,427 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Hawaii		109 953	4 034
Honolulu		815 900	597
Kalawaa		144	14
Kauai		45 191	620
Maui		86 082	1 162
TOTAL STATE	---	---	---	---	---	---	1 057 270	6 427

FEMA Region 9 — NEVADA — Potential Fallout



STATE OF NEVADA -- FALLOUT RISK

Estimated 1985 Population: 938,191
 Land Area: 109,895 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Churchill						14 479	4 990
Clark		554 764	7 881				
Doublas		21 345	708				
Elko						21 012	17 135
Esmeralda		1 531	3 587				
Eureka						1 342	4 175
Humboldt						11 285	9 698
Lander						4 455	5 515
Lincoln						3 493	10 635
Lyon		16 208	2 007				
Mineral						5 961	3 744
Nye		15 772	18 155				
Pershing						3 587	6 036
Storey		1 877	264				
Washoe						215 966	6 317
White Pine						8 231	8 902
Carson City (Ind)						36 883	146
TOTAL STATE	---	---	---	---	611 497	32 602	326 694	77 293

[MAP WILL BE FURNISHED SEPARATELY]

REGION IX - AMERICAN SOMOA - Potential Fallout

B-225

T E R R I T O R Y O F A M E R I C A N S A M O A - - F A L L O U T R I S K

Estimated 1980 Population: 35,000
Land Area: 77 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Entire Territory						35 000	77
TOTAL TERRITORY	---	---	---	---	---	---	35 000	77

[MAP WILL BE FURNISHED SEPARATELY]

REGION IX - GUAM - Potential Fallout

B-227

T E R R I T O R Y O F G U A M -- F A L L O U T R I S K

Estimated 1985 Population: 112,900
Land Area: 209 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Entire Territory						112 900	209
TOTAL TERRITORY	---	---	---	---	---	---	112 900	209

W1
C

[MAP WILL BE FURNISHED SEPARATELY]

REGION IX - AMERICAN TRUST TERRITORY - Potential Fallout

B-229

U . S . T R U S T T E R R I T O R Y -- F A L L O U T R I S K

Estimated 1980 Population: 116,149

Land Area: 533 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Entire Territory						116 149	533
TOTAL Territory	---	---	---	---	---	---	116 149	533

F E M A R E G I O N X - - F A L L O U T R I S K S U M M A R Y

Estimated 1985 Population: 8,634,750
 Land Area: 815,946 square miles

STATE	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ?GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Alaska	---	---	---	---	---	---	534 271	570 833
Idaho	---	---	58 634	5 839	526 307	41 482	429 340	35 093
Oregon	---	---	---	---	---	---	2 683 926	96 187
Washington	---	---	581 999	2 548	3 045 577	30 894	774 696	33 070
TOTAL REGION X	---	---	640 633	8 387	3 571 884	72 376	4 422 233	735 183

[MAP WILL BE FURNISHED SEPARATELY]

REGION X - ALASKA - Potential Fallout

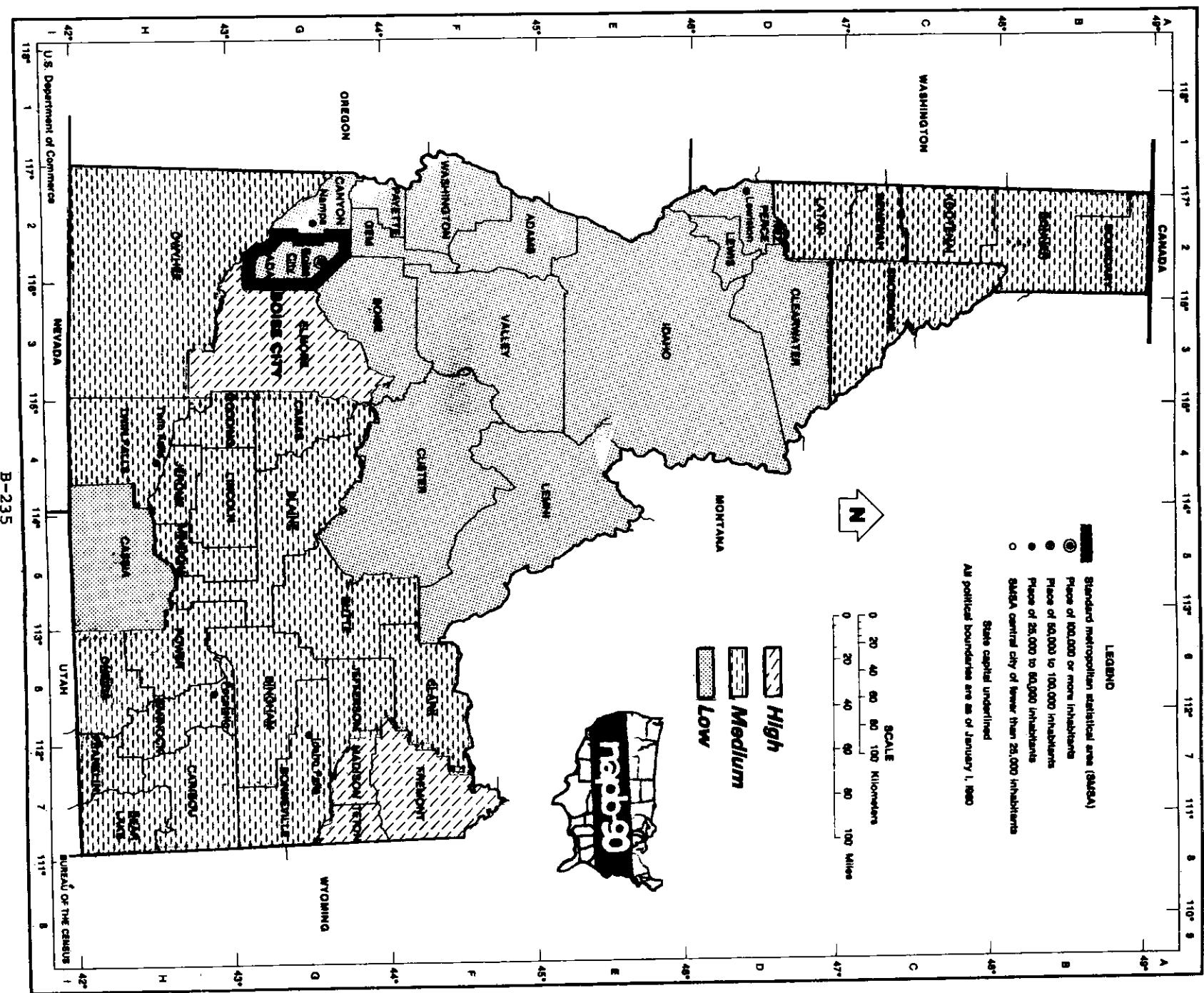
B-233

STATE OF ALASKA -- FALLOUT RISK

Estimated 1985 Population: 534,271
 Land Area: 570,833 square miles

COUNTY	VERY HIGH RISK [GT 15000R]	HIGH RISK [EQ/GT 6000R LT 15000R]	MEDIUM RISK [EQ/GT 3000R LT 6000R]	LOW RISK [LT 3000R]		
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Aleutian Islands				7 066	10 890
Anchorage				239 699	1 732
Bethel				12 358	36 104
Bristol Bay				1 142	531
Dillingham				4 988	46 042
Fairbanks North				64 320	7 404
Haines				1 997	2 374
Juneau				24 835	2 626
Kenai Peninsula				43 080	16 056
Ketchikan Gateway				13 381	1 242
Kobuk				5 768	31 593
Kodiak Island				17 229	4 796
Matanuska-Susitna				32 533	24 502
Nome				7 758	23 871
North Slope				5 303	90 955
Prince of Wales				5 077	7 660
Sitka				7 344	2 938
Skagway-Yakutat				4 068	13 239
SE Fairbanks				6 428	24 169
Valdez-Cordova				8 583	39 229
Wade Hampton				5 725	17 816
Wrangell-Petersburg				6 396	5 965
Yukon-Koyukuk				9 193	159 099
TOTAL STATE	---	---	---	---	534 271	570 833

FEMA Region 10 – IDAHO – Potential Fallout



STATE OF IDAHO -- FALLOUT RISK

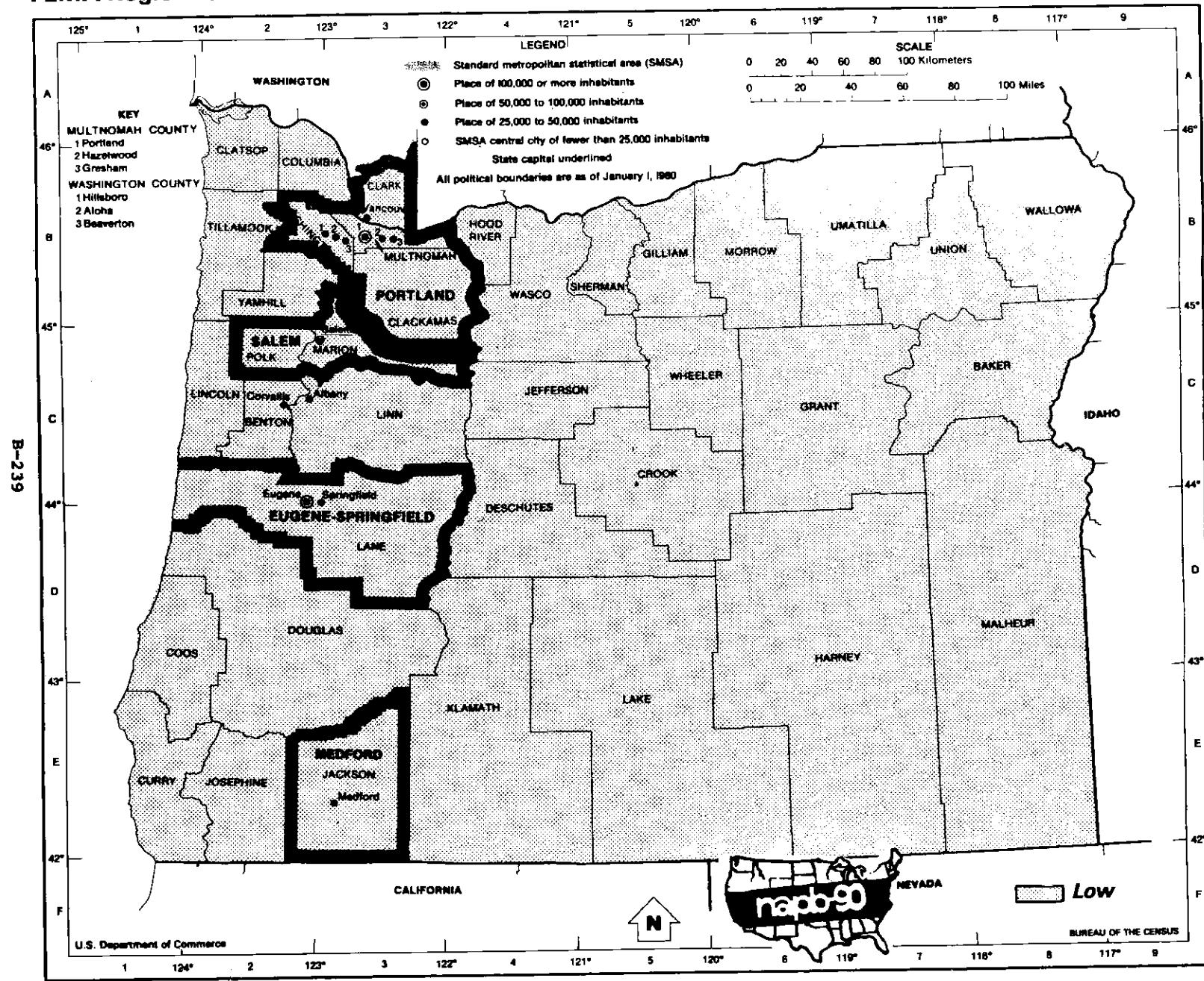
Estimated 1985 Population: 1,014,281
 Land Area: 82,414 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Ada								
Adams							193 281	1 052
Bannock					69 355	1 112		
Bear Lake					7 181	990		
Benewah					8 678	784		
Bingham					38 633	2 096		
Blaine					13 418	2 635		
Boise								
Bonner					26 862	1 727	2 907	1 901
Bonneville					69 727	1 840		
Boundary					7 620	1 268		
Butte					3 359	2 236		
Camas					765	1 071		
Canyon							88 722	584
Caribou					8 673	1 763		
Cassia								
Clark					779	1 763	21 278	2 560
Clearwater								
Custer							10 291	2 236
Elmore			22 234	3 071			6 866	4 927
Franklin					9 856	664		
Fremont			10 996	1 852				
Gem								
Gooding					12 580	728	11 460	558
Idaho							14 527	8 497

STATE OF IDAHO (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Jefferson				16 569	1 093		
Jerome				16 212	601		
Kootenai				67 097	1 240		
Latah				30 625	1 077		
Lemhi						7 891	4 564
Lewis						3 922	478
Lincoln				3 756	1 205		
Madison		22 102	468				
Minidoka				21 531	758		
Nez Perce						33 254	845
Oneida				3 539	1 200		
Owyhee				8 839	7 643		
Payette						15 937	405
Power				6 852	1 403		
Shoshone				16 897	2 641		
Teton	3 302	448					
Twin Falls				56 904	1 944		
Valley						7 000	3 670
Washington						8 572	1 454
TOTAL STATE	---	---	58 634	5 839	526 307	41 482	429 340	35 093

FEMA Region 10 — OREGON — *Potential Fallout*



STATE OF OREGON -- FALLOUT RISK

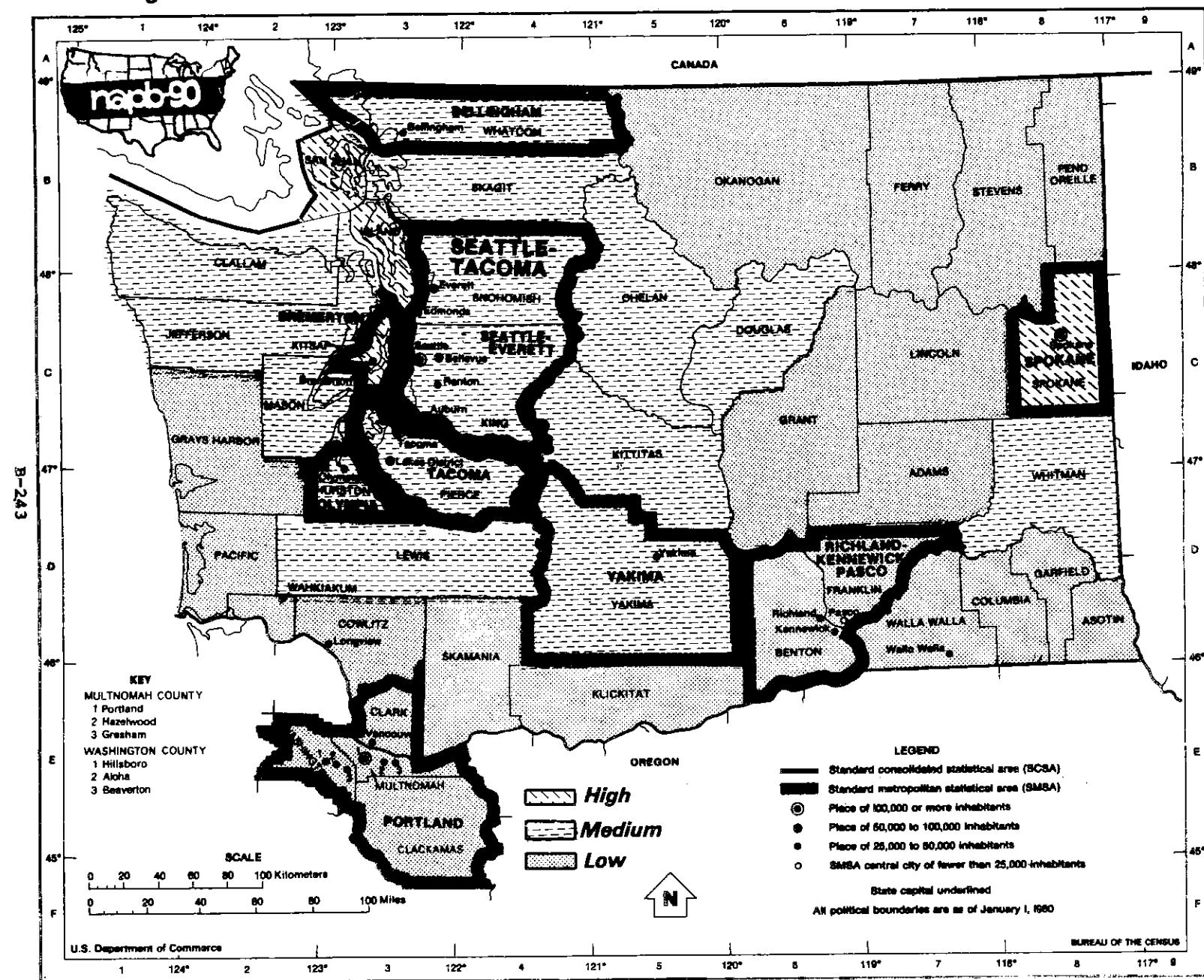
Estimated 1985 Population: 2,683,926
 Land Area: 96,187 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Baker						16 399	3 072
Benton						65 950	679
Clackamas						255 328	1 870
Clatsop						32 360	805
Columbia						37 060	651
Coos						60 458	1 606
Crook						13 003	2 984
Curry						16 878	1 629
Deschutes						65 782	3 025
Douglas						91 809	5 044
Gilliam						1 883	1 213
Grant						8 231	4 525
Harney						6 989	10 174
Hood River						16 536	521
Jackson						136 961	2 787
Jefferson						12 797	1 789
Josephine						64 672	1 640
Klamath						58 300	5 954
Lake						7 880	8 251
Lane						264 127	4 562
Lincoln						37 132	980
Linn						90 056	2 296
Malheur						29 073	9 861
Marion						211 140	1 184
Morrow						7 813	2 044

STATE OF OREGON (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Multnomah		561 570	431
Polk		45 358	741
Sherman		2 294	827
Tillamook		21 679	1 101
Umatilla		60 893	3 217
Union		24 745	2 036
Wallowa		7 595	3 150
Wasco		22 521	2 385
Washington		268 875	725
Wheeler		1 489	1 713
Yamhill		58 290	715
TOTAL STATE	---	---	---	---	---	---	2 683 926	96 187

FEMA Region 10 – WASHINGTON – Potential Fallout



STATE OF WASHINGTON -- FALLOUT RISK

Estimated 1985 Population: 4,402,272
 Land Area: 66,512 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Adams							13 664	1 922
Asotin							17 309	635
Benton							113 359	1 715
Chelan			49 587	2 915				
Clallam			52 381	1 753				
Clark							207 459	627
Columbia							4 031	864
Cowlitz							79 164	1 139
Douglas			24 068	1 817				
Ferry							6 023	2 200
Franklin							36 914	1 243
Garfield							2 567	706
Grant							52 678	2 660
Grays Harbor							64 224	1 918
Island		48 374	212					
Jefferson				17 748	1 805			
King				1 337	360	2 128		
Kitsap			169 172	393				
Kittitas					25 016	2 308		
Klickitat							16 603	1 880
Lewis				57 735	2 409			
Lincoln							9 627	2 310
Mason				35 586	961			
Okanogan							33 037	5 281
Pacific							17 922	908

STATE OF WASHINGTON (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Pend Oreille						8 902	1 400
Pierce				523 288	1 675		
San Juan	8 901	179					
Skagit				70 097	1 735		
Skamania		7 467	1 672
Snohomish				375 615	2 098		
Spokane	355 552	1 764				31 565	2 468
Stevens							
Thurston				141 832	727		
Wahkiakum		3 681	261
Walla Walla		48 500	1 261
Whatcom				113 087	2 125		
Whitman				41 031	2 151		
Yakima				181 146	4 287		
TOTAL STATE	---	---	581 999	2 548	3 045 577	30 894	774 696	33 070

