County-Level Risk Assessment: Kankakee County, Illinois

Guide to the Report

Table 1: This table contains basic statistics of the county as a whole which helps set the context for the rest of the analysis and visualizations as described below.

Table 2: This table describes the number of census tracts grouped by their computed resilience levels. The basic resilience values of each tract are grouped into 5 quantiles (resilience levels), where 5 (very high resilience) covers counties having resilience values in the top 20

Table 3: This table contains the Indicator Group Rankings, which contain a five-point rating across five indicator themes: housing, economy, community health, infrastructure, and environment. It shows where the current county falls compared to other counties in the state (Low Risk means the resilience value for the current county is in the top 20

Table 4: This table contains the Indicator Group Rankings computed across all tracts in the county which correspond to rural areas, similar to Table 3. The resilience values across all tracts are aggregated at the county level, which is then converted into quantiles which serve as rankings.

Table 5: This table contains the Indicator Group Rankings computed across all tracts in the county which correspond to urban areas, similar to Table 3. The resilience values across all tracts are aggregated at the county level, which is then converted into quantiles which serve as rankings.

Table 6: This table describes the Census Places in the county grouped by their resilience categories. This is similar to Table 2, the resilience values are categorized into 5 levels and aggregated over all the Census Places over the county.

Table 7: This table contains the Indicator Group Rankings computed across all census places in the county, similar to Table 3. The resilience values across all census places are aggregated at the county level, which is then converted into quantiles which serve as rankings.

Figure 1: This maps plots each census tract in the entire county and color-codes each tract with its computed resilience levels.

Figure 2: This pie chart shows the composition of the county on the basis of percentage of census tracts in each resilience category.

Figure 3: This map shows the urban resilience of all tracts which are classified as 'urban', i.e. they are assigned a USDA RUCA code of 1. Urban resilience is only computed across all urban tracts in the entire state, whereas overall resilience is computed across all tracts.

Figure 4: This map shows the rural resilience of all tracts which can be classified as 'rural', i.e. they are assigned a USDA RUCA code different from 1. Rural resilience is computed across all rural tracts in the state, similar to urban resilience.

Figure 5: In this map, the census places within the state are shown and the subject county is h ighlighted using a red border that outlines the county boundary.

Figure 6: This figure is a map of the subject county showing all the census places inside it, color coded with the places resilience levels. Place resilience is computed across all census places in the state, similar to rural and urban resilience.

Figure 7: This is a pie chart and table showing composition of the county on the basis of percentage of census places in each disaster resilience category.

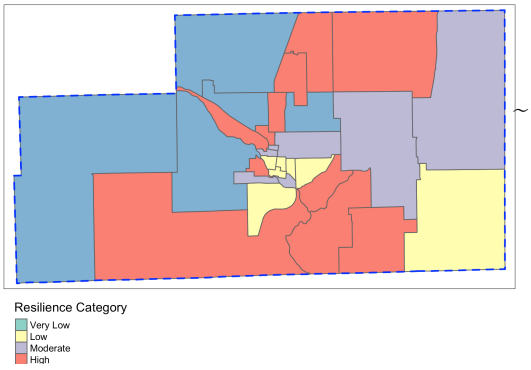
Appendix A: This table contains the different indicators used in the analysis, their definition, what it means when the indicator is said to be at low or high risk, and the risk level computed for this indicator at the county level. The risk level is computed by comparing the value of the indicator across all counties in the state and converting the raw values into quantiles: Very High, High, Moderate, Low, and Very Low.

Appendix B: This table contains the different indicators used in the analysis and their computed risk level for all rural, urban census tracts as well as the census places present inside the county. The risk level is computed across all counties in the state and converted into quantiles: Very High, High, Moderate, Low, Very Low.

Disclaimer: Variables from County health patterns, EQI and County transportation patterns might have aggregation errors at the tract, urban, rural and census place levels owing to unavailability of data beyond the county level.

Census Tracts within Kankakee County, Illinois

Figure 1



Basic Statistics

Table 1: Basic Statistics (County level)

Information	Value
Population	109924 persons
Area sq. miles	677.78 sqm
Gross Density(persons/sq mil)	162 p/sqm
Avg HH Size	2.59 persons
Median HH Income	59370 USD

Count of Tracts in each Category

Figure 2

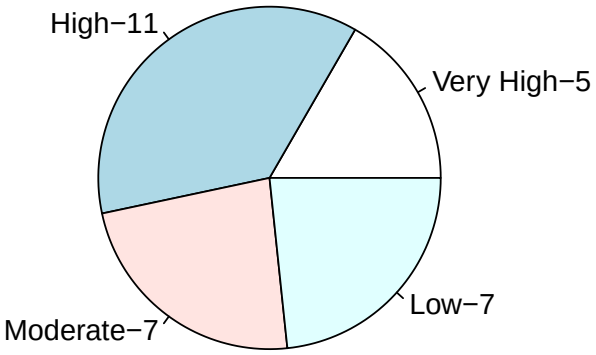


Table 2: Percentage of Census Tracts under each Resilience Category(County level)

Very High	High	Moderate	Low	Very Low
17	37	23	23	0

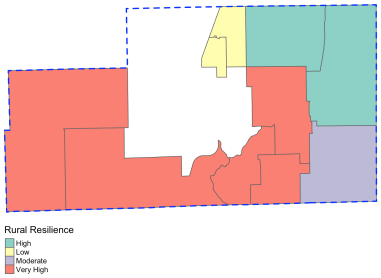
Indicator Group Rankings

Table 3: Overall Indicator Group Rankings

Indicator Group	High Risk Areas	Low Risk Areas
Community 		Percent BachelorsDegree, Physically Unhealthy Days, Food Environment Index, PrimaryCare Physicians Rate, COVID-19 death rate
Economy 		UnstableEmployment percent, LowIncome Percent, Service LQ, Others, Gender Pay Gap.x
Housing 	Percent Children in Poverty.y, Percent income required for childcare expenses.y	MobileHomes
Environment 	co, pct nematode acres, pct harvested acres, insecticide, NO3Ave, SO4Ave, W BENZOAP	Facilities Rate, Pct BS, Kave, ClAve, W Ba, W FL, W NO3, W ENDRIN, W METHOXYCHLOR, W DALAPON, W DEHA, W SIMAZINE, W DEHP, W PICLORAM, W DINOSEB, W 24D, W PCP, W PCB, W DBCP, W EDB, W CHLORDANE
Infrastructure 		Protective Services, Percent BroadbandAccess

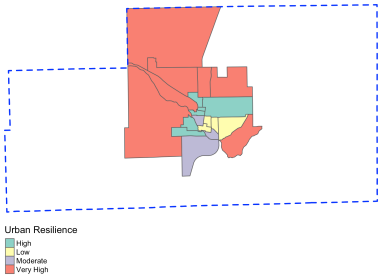
Rural Resilience within Kankakee County, Illinois

Figure 3



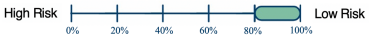
Urban Resilience within Kankakee County, Illinois

Figure 4



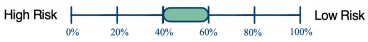
Rural Indicator Rankings

Table 4: Rural Indicator Group Rankings

Indicator Group	High Risk Areas	Low Risk Areas
Community 		Young percent, Educated percent, Elderly growth percent, Percent Commuters, COVID-19 death rate
Economy 		WorkNearby percent, MBS LQ, Service, Service LQ, Info LQ, Others, Gender Pay Gap.x, CommuteTime
Housing 	Renter MHHI, Percent Children in Poverty.y, Percent income required for childcare expenses.y	Renters Cost IncomeRatio, GroupQuarters
Environment 	co, pct nematode acres, pct harvested acres, insecticide, ALLNPDESperKM, NO3Ave, SO4Ave, W BENZOAP	pct disease acres, std metal prim pop, std sandandgravel prim pop, Facilities Rate, Kave, ClAve, W HG, W NO3, W NO2, W ATRAZINE, State
Infrastructure 	No CommunicationSources	

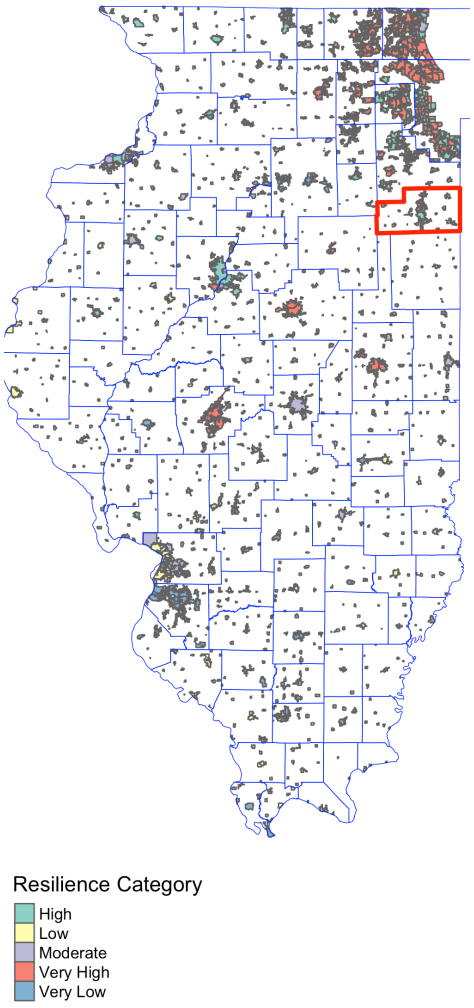
Urban Indicator Rankings

Table 5: Urban Indicator Group Rankings

Indicator Group	High Risk Areas	Low Risk Areas
Community 	Percent LanguageBarrier	NonWhite Percent, Females Percent, PrimeWorkingAge percent, Percent NoHealthIns, Food Environment Index, Percent Exercise Access, Social Association Rate
Economy 		MBS LQ, Service, PT, Agri, Retail LQ, Edu, Arts LQ, Others LQ
Housing 	Cost IncomeRatio	Percent Section8
Environment 	PCT IRRIGATED ACRES, pct nematode acres, pct harvested acres, std nonmetal prim pop, SO4Ave, W BENZOAP	pct defoliate acres, std metal prim pop, W Ba, W HG, W ENDRIN, W METHOXYCHLOR, W DALAPON, W DEHA, W SIMAZINE, W DEHP, W PICLORAM, W DINOSEB, W ATRAZINE, W 24D, W PCP, W PCB, W DBCP, W EDB, W CHLORDANE
Infrastructure 		No Pubtrans

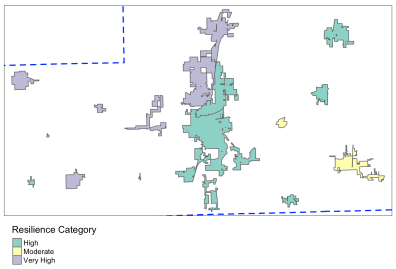
State-Level Places Map

Figure 5



Places Map within Kankakee County, Illinois County, IL

Figure 6



Count of Places in each Category

Figure 7

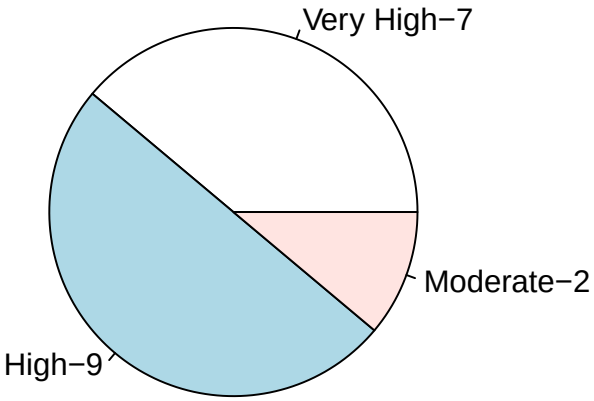


Table 6: Percentage of Census Tracts under each Resilience Category(County level)

Very High	High	Moderate	Low	Very Low
39 %	50 %	11 %	0 %	0 %

Places Indicator Rankings

Table 7: Places Indicator Group Rankings

Indicator Group	High Risk Areas	Low Risk Areas
Community 		FemaleHeaded HHs Percent, Working Nonworking ratio, HelperPool, Percent BachelorsDegree, Percent Commuters, Physically Unhealthy Days, Food Environment Index, PrimaryCare Physicians Rate, COVID-19 death rate
Economy 		Unemployment percent, Management LQ, Edu, Gender Pay Gap.x
Housing 	MobileHomes, Percent Children in Poverty.y, Percent income required for childcare expenses.y	Overcrowding, Renters Cost IncomeRatio, GroupQuarters
Environment 	co, pct nematode acres, pct harvested acres, insecticide, NO3Ave, SO4Ave, W BENZOAP	std metal prim pop, Facilities Rate, Pct BS, Kave, ClAve, W Ba, W FL, W HG, W NO3, W NO2, W ATRAZINE
Infrastructure 	No CommunicationSources	Pubtrans heavilyDependent, Protective Services, Percent BroadbandAccess

Relevant Resources

The following represent key areas of concern (in order of importance) at the county level:
- **Housing**
- **Environment**

The resources below have been extracted from the Disaster Planning Library to facilitate planning for high-risk areas observed through the assessment. Please go through the following tools as a starting point for your planning process and feel free to search the Disaster Planning Library for further information, if required. The resources here are included to facilitate the process of hazard mitigation planning, through the Planning for a Purpose Model of Illinois Extension (see Toolkit).

Housing

Buildings and Codes

- **Partial Implementation Of The Federal Flood Risk Management Standard For Hazard Mitigation Assistance Programs (Interim)**
  Organization : FEMA
  Year : 2021
  Document_type : Planning Tool, Policy
  Disasters : Flood
  Abstract : In its Hazard Mitigation Assistance (HMA) programs, the Federal Emergency Management Agency (FEMA) utilizes the American Society of Civil Engineers (ASCE) 24-14,3 or latest edition, to establish minimum design and construction requirements for structure elevation, dry floodproofing, and mitigation reconstruction.4 Under this interim policy, the FFRMS FVA will be utilized to determine the minimum flood protection elevation for certain project types. This interim policy applies to all HMA programs: the Hazard Mitigation Grant Program (HMGP), HMGP Post Fire, Building Resilient Infrastructure and Communities (BRIC), and Flood Mitigation Assistance (FMA).
  Plan_Components : Strategies, Planning Processes

- **Building Codes Toolkit**
  Organization : FEMA
  Year : 2021
  Document_type : Manual for an Local Organization
  Disasters : Tornado, Flood, Extreme Weather, Earthquakes, Wildfires, Soil Erosion/Landslides
  Abstract : The new FEMA Building Science Branch Building Codes Toolkit offers basic guidance and tools to help building owners and occupants learn about building codes and the process of making a building stronger against natural hazards.
  Plan_Components : Strategies, Planning Processes, Funding Mechanisms

- **Building Code And Floodplain Management Administration And Enforcement**
  Organization : FEMA
  Year : 2018
  Document_type : Policy
  Disasters : Tornado, Flood, Extreme Weather, Earthquakes, Wildfires, Man-Made Disasters, Soil Erosion/Landslides
  Abstract : The Disaster Recovery Reform Act of 2018 (DRRA), amended Sections 402 and 406 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), and authorized FEMA to “provide assistance to state and local governments for building code and floodplain administration and enforcement, including inspections for substantial damage compliance”1 and “base and overtime wages for extra hires to facilitate the implementation and enforcement of adopted building codes for a period of not more than 180 days after the major disaster is declared.”

Plan_Components : Strategies, Funding Mechanisms

- **Building Codes Save: A Nationwide Study**
  Organization : FEMA
  Year : 2020
  Document_type : General Resource/ Foundational Research
  Disasters : Tornado, Flood, Drought, Extreme Weather, Earthquakes, Wildfires, Soil Erosion/Landslides
  Abstract : The findings of the MAT investigations, the magnitude of recent hazard events,
  and the escalating cost of natural disasters together revealed a compelling need to quantify the value of building codes in reducing damage from natural disasters nationwide.
  Plan_Components : Surveys/Assessments

- **Protecting Communities And Saving Money**
  Organization : FEMA
  Year : 2020
  Document_type : General Resource/ Foundational Research
  Disasters : Tornado, Flood, Drought, Extreme Weather, Earthquakes, Wildfires, Soil Erosion/Landslides
  Abstract : One of the most cost-effective ways to safeguard our communities against natural disasters is to adopt and follow hazard-resistant building codes. Not only are casualties reduced, but the cost of building damage is also reduced during a natural disaster. Building codes also help communities get back on their feet faster by minimizing indirect costs such as business interruptions and lost income. A new FEMA study has made the impact of building codes on sustainability clear. The cost of not adopting building codes is too high.
  Plan_Components : Surveys/Assessments, Strategies, Planning Processes, Funding Mechanisms, Case Studies

- **Resilience Toolkit**
  Organization : ICC (International Code Council)
  Year : 2022
  Document_type : Web-based Resource
  Disasters : Tornado, Flood, Drought, Extreme Weather, Earthquakes, Wildfires, Soil Erosion/Landslides
  Abstract : Over the past twenty years communities worldwide have experienced disaster events that have significantly impacted their society, economy, and culture. As populations grow, urban areas expand, and interconnectedness increases, the potential for a disaster event to have deeper and further-reaching consequences also increases. As a result, there is a need to implement measures that increase resilience across the social, organizational, and infrastructural aspects of communities - community resilience.
  Plan_Components : Strategies, Planning Processes

- **Resilience Strategies For Wildfire**
  Organization : Center for Climate and Energy Solutions
  Year : 2018
  Document_type : Planning Tool, Example Ordinances and Codes
  Disasters : Wildfires
  Abstract : The risk of wildfire is expected to grow across the United States due to reduced precipitation in some regions, and higher temperatures caused by climate change. Wildfire has far-reaching impacts that can ripple through communities, regions, watersheds, and ecosystems. This paper overviews a number of adaptation strategies for areas with a projected increase in wildfire conditions. For each strategy, it will discuss design and operation costs, and primary and co-benefits. The paper includes a community case
  study of Austin, Texas, which has used a number of these strategies, and a list of publications and

interactive tools to help communities become more resilient to wildfire
Plan_Components : Strategies, Planning Processes, Case Studies, Tools, Information

- **Tornado Risks And Hazards In The Midwest United States**
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  Disasters : Tornado
  Abstract : The purpose of this Tornado Recovery Advisory (RA) is to summarize facts about the Midwest tornado hazard, specifically the area served by FEMA Region VII. Region VII includes Iowa, Kansas, Missouri, and Nebraska. The general population, specifically homeowners and renters, policy makers, local officials, builders, and building officials know and understand
  that tornado occurrence in the Midwest is not a rare event. In fact, more than half of the 20 states with the highest frequency of tornado occurrence on record, and 4 of the top 5 (Texas, Oklahoma, Kansas, and Nebraska) are located in the Midwest
  Plan_Components : Surveys/Assessments, Strategies, Tools, Information

- **Tornado Protection Selecting Refuge Areas In Buildings**
  Organization : FEMA
  Year : 2009
  Document_type : Manual for an Local Organization
  Disasters : Tornado
  Abstract : The guidance presented in this booklet is intended primarily to help
  building administrators, architects, and engineers select the best available
  refuge areas in existing schools. Building administrators, architects, and
  engineers are encouraged to apply this guidance so that the number of
  injuries and deaths will be minimized if a tornado strikes an occupied
  school
  Plan_Components : Strategies, Planning Processes, Case Studies, Tools, Information

- **Sustainable Land Development Code City Of Greensburg, Kansas**
  Organization : GREENSBURG PLANNING COMMISSION
  Year : 2011
  Document_type : Example Ordinances and Codes
  Disasters : Tornado, Flood, Soil Erosion/Landslides, Agricultural Disasters
  Abstract : City code for Greensburg, Kansas. The small rural town is a unique example in which the entire town was destroyed by a tornado. This gave leeway for a complete reimagination of the town and code, building a sustainable and resilient community from the ground up.
  Plan_Components : Strategies, Tools, Green Infrastructure, Information

- **Code Of Ordinances Village Of Thomasboro, Illinois**
  Organization : Order of the Board of Trustees, Village of Thomasboro
  Document_type : Example Ordinances and Codes
  Disasters : Tornado, Flood, Drought, Extreme Weather, Earthquakes, Man-Made Disasters
  Abstract : Code of Ordinances for a small rural town in Illinois.
  Plan_Components : Strategies, Funding Mechanisms, Information

- **State Of Illinois Illinois Department Of Natural Resources Model Stormwater Management Ordinance**
  Organization : Illinois Department of Natural Resources
  Year : 2015
  Document_type : Planning Tool, Manual for an Local Organization, Policy
  Disasters : Flood, Drought, Extreme Weather, Soil Erosion/Landslides
  Abstract : In June 2015, the Illinois Department of Natural Resources, Office of Water Resources

(IDNR/OWR) issued a report for the Urban Flooding Awareness Act. The report recognizes that combating the damages of urban flooding requires a coordinated approach from state and local governments. A critical component in that effort is for local governmental entities to adopt sound, comprehensive stormwater management ordinances that incorporate best practices. To that end, IDNR/OWR and the Illinois State Water Survey (ISWS) developed this Model Stormwater Management Ordinance as a
resource for counties and municipalities to use when drafting or revising their own stormwater ordinances. While local development, review, and approval processes are unique, IDNR/OWR provides this document as a template containing the minimum requirements for an effective ordinance and suggestions for more advanced stormwater protection
Plan_Components : Tools, Green Infrastructure, Information

- **Zoning And Disaster Recovery**
  Organization : American Planning Association
  Year : 2021
  Document_type : General Resource/ Foundational Research
  Disasters : Tornado, Flood, Extreme Weather, Earthquakes, Man-Made Disasters, Soil Erosion/Landslides
  Abstract : What if substantial portions of your community were suddenly and severely damaged by a catastrophic flood, earthquake, industrial accident, or other disaster? What role would the local planning agency play in the rebuilding and recovery process? What challenges would you face as you attempted to help residents and business owners rebuild their lives and livelihoods? How effective would your efforts be?

An effective recovery process means more than merely rebuilding what existed before. Disasters also provide important opportunities for proactive planning in which the community emerges more resilient to subsequent hazard events. This opportunity is fleeting, and local policies and ordinances like the zoning code can either facilitate or impede effective and resilient recovery.

This issue of Zoning Practice summarizes some of the zoning-related challenges planners face in post-disaster situations, discusses how communities might think about preparing now for future disasters, and highlights what other communities have achieved by modifying zoning procedures and standards.
Plan_Components : Strategies, Information

Floods and Disaster Mitigation

- **Partial Implementation Of The Federal Flood Risk Management Standard For Hazard Mitigation Assistance Programs (Interim)**
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- **Building Codes Toolkit**
  Organization : FEMA

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Plan_Components : Surveys/Assessments, Strategies, Planning Processes, Funding Mechanisms, Case Studies

- **Resilience Toolkit**
Organization : ICC (International Code Council)
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Document_type : Web-based Resource
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  refuge areas in existing schools. Building administrators, architects, and
  engineers are encouraged to apply this guidance so that the number of
  injuries and deaths will be minimized if a tornado strikes an occupied
  school
  Plan_Components : Strategies, Planning Processes, Case Studies, Tools, Information

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  Organization : GREENSBURG PLANNING COMMISSION
  Year : 2011
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  Document_type : Planning Tool, Manual for an Local Organization, Policy
  Disasters : Flood, Drought, Extreme Weather, Soil Erosion/Landslides
  Abstract : In June 2015, the Illinois Department of Natural Resources, Office of Water Resources (IDNR/OWR) issued a report for the Urban Flooding Awareness Act. The report recognizes that combating the damages of urban flooding requires a coordinated approach from state and local governments. A critical component in that effort is for local governmental entities to adopt sound, comprehensive stormwater management ordinances that incorporate best practices. To that end, IDNR/OWR and the Illinois State Water Survey (ISWS) developed this Model Stormwater Management Ordinance as a
  resource for counties and municipalities to use when drafting or revising their own stormwater ordinances. While local development, review, and approval processes are unique, IDNR/OWR provides this document as a template containing the minimum requirements for an effective ordinance and suggestions for more advanced stormwater protection
  Plan_Components : Tools, Green Infrastructure, Information

- **Zoning And Disaster Recovery**
  Organization : American Planning Association
  Year : 2021
  Document_type : General Resource/ Foundational Research
  Disasters : Tornado, Flood, Extreme Weather, Earthquakes, Man-Made Disasters, Soil Erosion/Landslides
  Abstract : What if substantial portions of your community were suddenly and severely damaged by a catastrophic flood, earthquake, industrial accident, or other disaster? What role would the local planning agency play in the rebuilding and recovery process? What challenges would you face as you attempted to help residents and business owners rebuild their lives and livelihoods? How effective would your efforts be?

An effective recovery process means more than merely rebuilding what existed before. Disasters also provide important opportunities for proactive planning in which the community emerges more resilient to subsequent hazard events. This opportunity is fleeting, and local policies and ordinances like the zoning code can either facilitate or impede effective and resilient recovery.

This issue of Zoning Practice summarizes some of the zoning-related challenges planners face in post-disaster situations, discusses how communities might think about preparing now for future disasters, and highlights what other communities have achieved by modifying zoning procedures and standards.
Plan_Components : Strategies, Information

Environment

Environmental Resources

- **Branching Out: Agroforestry As A Climate Change Mitigation And Adaptation Tool For Agriculture**
  Organization : Journal of Soil and Water Conservation
  Year : 2012
  Document_type : General Resource/ Foundational Research, Planning Tool
  Disasters : Flood, Drought, Extreme Weather, Man-Made Disasters, Soil Erosion/Landslides, Agricultural Disasters
  Abstract : US and Canadian agricultural lands are being pressed to provide more environmental and economic services, while at the same time their capacity to provide these services under potential climate change (CC) is being questioned (Field et al. 2007; CAST 2011). Producers are already experiencing weather patterns outside of climate norms (e.g., the 2011 droughts in Texas, and flooding along the Missouri River in the United States and
  along the Red River in Canada) that have had significant impacts on production. Predictions of future climate conditions for the US Midwest include longer growing seasons that could potentially increase crop yields but also increase heat waves,
  floods, droughts, and insect and weed issues that may then adversely impact production (USGCRP 2009). Climate change drives many stressors and interacts with many non-climatic stressors. This makes it difficult to forecast outcomes in any general way other than many existing threats to agricultural production, such as erosion and pests, which will most likely be exacerbated under shifting climate (Field et al. 2007; USGCRP 2009). Creating profitable and healthy operations under this unpredictable interplay of factors driven by shifting climate (and, along with it, shifting markets) will be a daunting task.
  It will be essential that farmers, ranchers, and even communities have a variety of land management options to minimize the risks and maximize services under such uncertain conditions.
  Plan_Components : Strategies

- **Green Infrastructure: Smart Conservation For The 21st Century**
  Organization : Renewable Resources Journal
  Year : 2002
  Document_type : General Resource/ Foundational Research, Planning Tool
  Disasters : Flood, Man-Made Disasters
  Abstract : "Green infrastructure" is a term becoming more commonly used among natural resource professionals. While it means different things to different people, depending on the context in which it is used, for the purposes of this article, green infrastructure is an interconnected network of green space that conserves natural ecosystem values and functions and provides associated benefits to human populations. Green infrastructure is the ecological framework needed for environmental, social and economic sustainability- our nation's natural life support system. Planning utilizing green infrastructure differs from conventional open space planning because it looks at conservation values in concert with land development, growth management and built infrastructure planning. This article introduces green infrastructure as a strategic approach to land conservation that addresses the ecological and social impacts of sprawl and the accelerated consumption and fragmentation of open land. It describes the concept and value of green infrastructure and presents seven principles for successful green infrastructure initiatives.
  Plan_Components : Planning Processes

- **Emergency Support Function #11**
  Organization : Department of Agriculture
  Year : 2016
  Document_type : General Resource/ Foundational Research
  Disasters : Agricultural Disasters

Abstract : Emergency Support Function (ESF) #11 – Agriculture and Natural Resources organizes and coordinates Federal support for the protection of the Nation's agricultural and natural and cultural resources during national emergencies. ESF #11 works during
actual and potential incidents to provide nutrition assistance; respond to animal and agricultural health issues; provide technical expertise, coordination and support of animal and agricultural emergency management; ensure the safety and defense of the
Nation's supply of meat, poultry, and processed egg products; and ensure the protection of natural and cultural resources and historic properties
Plan_Components : Strategies

- **Questions And Answers About Drainage Water Management For The Midwest**
  Organization : Purdue Extension
  Document_type : General Resource/ Foundational Research
  Disasters : Flood, Drought, Man-Made Disasters, Biological Disasters, Agricultural Disasters
  Abstract : Subsurface tile drainage is an essential water management practice on many highly productive fields in the Midwest. However, nitrate carried in drainage water can lead to local water quality problems and contribute to hypoxia in the Gulf of Mexico, so
  strategies are needed to reduce the nitrate loads while maintaining adequate drainage for crop production. Practices that can reduce nitrate loads on tile-drained soils include growing winter forage or cover crops, fine-tuning fertilizer application rates and timing,
  bioreactors, treatment wetlands, and modifying drainage system design and operation. Drainage water management is one of these practices and is described in this fact sheet. Answers given here apply specifically to Midwest corn and soybean cropping
  systems, and not to perennial or winter annual crops.
  Plan_Components : Strategies, Funding Mechanisms

- **Cover Crop Decision Tool**
  Organization : Midwest Cover Crop Council
  Year : 2021
  Document_type : General Resource/ Foundational Research, Manual for an Local Organization
  Disasters : Biological Disasters, Soil Erosion/Landslides, Agricultural Disasters
  Abstract : Decision tool for deciding what cover crop to use.
  Plan_Components : Strategies

- **Buffers And Vegetative Filter Strips**
  Organization : EPA
  Document_type : General Resource/ Foundational Research
  Disasters : Flood, Drought, Biological Disasters, Soil Erosion/Landslides
  Abstract : Buffers have been found to be most effective in trapping particulate pollutants. In addition, the export of soluble pollutants is expected to decrease when infiltration is maximized. Narrow buffers have also been shown to be effective in reducing the export of particulate pollutants when the integrity of the system is maintained. This highlights that one of the primary functions
  of buffers is to slow surface water movement which reduces the export of pollutants, particularly 2 particulate pollutants, and narrow strips of dense grass can function in this capacity and provide water quality benefits (Dabney et al. 2006). Also, these narrow strips could be used in-field as vegetative barriers to slow pollutant movement in-field and control concentrated flow erosion.
  To maximize infiltration of runoff, wider buffers or a greater buffer area to source area should be used. Research has found a significant range in buffer performance with reported sediment
  trapping efficiencies ranging from 41% to 100% and infiltration efficiencies ranging from 9% to 100%.
  Plan_Components : Surveys/Assessments

- **Aquifer Storage And Recovery**
  Organization : FEMA
  Document_type : Manual for an Local Organization

Disasters : Flood, Drought
Abstract : FEMA is encouraging communities to incorporate methods to mitigate the impacts of climate change into
eligible Hazard Mitigation Assistance (HMA) funded risk reduction activities by providing guidance on
mitigating flood and drought conditions. FEMA has developed initial guidance on flood and drought mitigation
activities including green infrastructure methods, expanded ecosystem service benefits, and three flood reduction and drought mitigation activities: Aquifer Storage and Recovery (ASR), Floodplain and Stream
Restoration (FSR), and Flood Diversion and Storage (FDS).
Plan_Components : Strategies

- **The Regional Conservation Partnership Program**
  Organization : USDA
  Year : 2022
  Document_type : Web-based Resource, Funding Opportunities
  Disasters : Flood, Man-Made Disasters, Soil Erosion/Landslides, Agricultural Disasters
  Abstract : The Regional Conservation Partnership Program (RCPP) promotes coordination of NRCS conservation activities with partners that offer value-added contributions to expand our collective ability to address on-farm, watershed, and regional natural resource concerns. Through RCPP, NRCS seeks to co-invest with partners to implement projects that demonstrate innovative solutions to conservation challenges and provide measurable improvements and outcomes tied to the resource concerns they seek to address.
  Plan_Components : Strategies, Funding Mechanisms, Green Infrastructure

- **Volunteer Fire Assistance Program**
  Organization : IDNR
  Year : 2022
  Document_type : Web-based Resource, Funding Opportunities
  Disasters : Wildfires
  Abstract : The Illinois Department of Natural Resources Division of Forestry administers the USDA Forest Service's VFA funds. The funds are for rural and small fire departments. The grant funds fire projects at 50% of the cost of a project up to $10,000 per department. Forestry's portion is up to $10,000, the Department may spend as much as they need to complete the project. No one item can be $5,000 or more. The funds can only be used for fire projects, EMS, HazMat or crash rescue are not eligible. The funds are awarded based on competitive applications. Applications will be posted on Forestry's web site. The Office of the State Fire Marshall will send out a blast email and post it on their web site and the Illinois Fire Service Institute (IFSI) will also post it on their web site. Once the application is posted, Departments will have three months to submit their applications. The types of projects that have been funded in previous grants include radios, hose, SCBA, turn out gear, wildland PPE, hand tools, chainsaws, backpack blowers, modifying federal excess vehicles and equipment and other equipment. For more information Contact Forestry's Wildland Fire Program Manager 217/782-8774.
  Plan_Components : Strategies, Funding Mechanisms, Tools

- **Wildland Fire Fighter Program**
  Organization : IDNR
  Year : 2022
  Document_type : Web-based Resource
  Disasters : Wildfires
  Abstract : Information about the Wildland Fire Fighter Program.
  Plan_Components : Information

- **Comprehensive Environmental Review Process Manual**
  Organization : IDNR
  Year : 2014
  Document_type : Manual for an Local Organization, Funding Opportunities
  Disasters : Man-Made Disasters, Biological Disasters, Soil Erosion/Landslides, Agricultural Disasters, habitat destruction, invasive species,
  Abstract : The Comprehensive Environmental Review Process (CERP) is an internal IDNR process to review:
  actions that the Department performs or funds,
  actions that the Department approves and a tax incentive is provided,
  actions that occur on IDNR-owned or leased land.
  An action is any activity that may change existing physical, chemical or biological conditions of air, land, or water.
  Plan_Components : Surveys/Assessments, Strategies, Green Infrastructure, Information

- **Community Flood Resilience In Vinton: Engaging Residents Affected By The Floods Of 2008 And 2016**
  Organization : Iowa Watershed Approach, U.S. Department of Housing and Urban Development (HUD)
  Year : 2020
  Document_type : Planning Tool, Manual for an Local Organization
  Disasters : Flood
  Abstract : Vinton was selected to be included in the Iowa Watershed Approach's Flood Resilience Program, which recognizes that social resources are often absent or minimally evident when it comes to flood resiliency. The program strives to improve the use of social resources in watersheds by connecting local partners and stakeholders, enhancing the presence of social resources in watershed planning efforts, and increasing the awareness and communication about established and novel flood resilience initiatives.
  Plan_Components : Surveys/Assessments, Strategies, Planning Processes, Case Studies

- **All Hazards**
  Organization : Iowa State Univesity
  Year : 2018
  Document_type : General Resource/ Foundational Research, Web-based Resource, Planning Tool
  Disasters : Tornado, Flood, Drought, Extreme Weather, Wildfires, Man-Made Disasters, Biological Disasters, Soil Erosion/Landslides, Agricultural Disasters
  Abstract : The educational materials found on this site are the compilation of many resources currently available on-line. The information has been gathered from federal agencies such as the Centers for Disease Control and Prevention (CDC), Environmental Protection Agency, the Federal Emergency Management System (FEMA), the U.S. Department of Agriculture (USDA), the Food and Drug Administration, and the National Oceanic and Atmospheric Administration (NOAA). Many non-governmental groups, such as the American Red Cross and the National Safety Council, as well as various Cooperative Extension agencies also have resources and information for preparedness that are provided through this website.
  Plan_Components : Surveys/Assessments, Planning Processes, Tools, Information

- **Upper South Branch Kishwaukee River Watershed Improvement Plan**
  Organization : Applied Ecological Services Inc.
  Year : 2021
  Document_type : Specific Plan
  Disasters : Flood, Man-Made Disasters, Soil Erosion/Landslides, Agricultural Disasters

Abstract : A RESOLUTION ADOPTING THE UPPER SOUTH BRANCH KISHWAUKEE RIVER IMPROVEMENT WATERSHED PLAN AS AN AMENDMENT TO THE STORMWATER MANAGEMENT PLAN FOR DEKALB COUNTY, IL
Plan_Components : Surveys/Assessments, Strategies, Planning Processes, Green Infrastructure

- **Kane County 2040 Green Infrastructure Plan**
  Organization : Kane County Board, Quality of Kane, Greening Infrastructure, IDNR
  Year : 2012
  Document_type : Specific Plan
  Disasters : Flood, Soil Erosion/Landslides
  Abstract : The ultimate goal of the Kane County 2040 Green Infrastructure Plan is to lay the groundwork for green infrastructure planning and projects at the regional, community, neighborhood and site levels addressing current issues of water resource management, biodiversity, conservation, water supply, public health, climate change and economic development.
  Plan_Components : Surveys/Assessments, Planning Processes, Funding Mechanisms, Green Infrastructure, Information

- **State Of Illinois Illinois Department Of Natural Resources Model Stormwater Management Ordinance**
  Organization : Illinois Department of Natural Resources
  Year : 2015
  Document_type : Planning Tool, Manual for an Local Organization, Policy
  Disasters : Flood, Drought, Extreme Weather, Soil Erosion/Landslides
  Abstract : In June 2015, the Illinois Department of Natural Resources, Office of Water Resources (IDNR/OWR) issued a report for the Urban Flooding Awareness Act. The report recognizes that combating the damages of urban flooding requires a coordinated approach from state and local governments. A critical component in that effort is for local governmental entities to adopt sound, comprehensive stormwater management ordinances that incorporate best practices. To that end, IDNR/OWR and the Illinois State Water Survey (ISWS) developed this Model Stormwater Management Ordinance as a resource for counties and municipalities to use when drafting or revising their own stormwater ordinances. While local development, review, and approval processes are unique, IDNR/OWR provides this document as a template containing the minimum requirements for an effective ordinance and suggestions for more advanced stormwater protection
  Plan_Components : Tools, Green Infrastructure, Information

- **Kishwaukee River Corridor Green Infrastructure Plan**
  Organization : Chicago Wilderness, Illinois Department of Natural Resources
  Year : 2013
  Document_type : Specific Plan, Policy
  Disasters : Flood, Soil Erosion/Landslides
  Abstract : The Kishwaukee River Corridor Green Infrastructure Plan is based on an area in Winnebago County that has significant natural and recreation resources and has been identified for a new industrial development corridor. The assets and opportunities presented at this location made it an ideal site to incorporate green infrastructure into development plans. Chicago Wilderness recognized this opportunity, and Boeing funded a project to provide green infrastructure consulting and technical assistance to municipalities with jurisdiction over the development corridor. The result was a series of meetings and presentations over the past year and a half with municipalities, landowners, environmental organizations, press, and interested local citizens. During these meetings, consultants and environmental organizations explained green infrastructure and its benefits, presented examples, inventoried and mapped local resources, identified opportunities and challenges of local ordinances, listened to concerns and needs, and provided recommendations for protecting valuable assets and incorporating green infrastructure. This

plan documents this process and provides a compilation of inventories, reviews, and recommendations.
Plan_Components : Surveys/Assessments, Strategies, Green Infrastructure, Information

- **Mchenry County Green Infrastructure Plan**
  Organization : McHenry County, Chicago Wilderness, Grand Victoria Foundation
  Year : 2012
  Document_type : Specific Plan
  Disasters : Flood
  Abstract : The McHenry County 2030 Comprehensive Plan, adopted in April 2010, makes recommendations for the development and adoption of a green infrastructure plan for the county. To that end, and with the continued support of the County Board and Planning and Development Committee, this plan was undertaken in late 2010 by the Department of Planning and Development with the assistance of the Chicago Wilderness Sustainable Watershed Action Team (SWAT) and green infrastructure expert Dennis Dreher, who provided project coordination and technical and policy guidance
  Plan_Components : Surveys/Assessments, Strategies, Planning Processes, Green Infrastructure, Information

- **Impacts Of Natural Disasters On Agriculture, Food Security, And Natural Resources And Environment In The Philippines**
  Organization : ERIA Research Project Report
  Year : 2012
  Document_type : General Resource/ Foundational Research, Scientific Article
  Disasters : Flood, Drought, Extreme Weather, Agricultural Disasters
  Abstract : This study quantitatively and qualitatively analyzed the impacts of natural disasters (particularly typhoons, floods and droughts) on agriculture, food security and the natural resources and environment in the Philippines. It aimed to propose recommendations as to how best to respond to the impacts of natural disasters and to suggest further studies that can be undertaken. In general, the study found that: a) typhoons, floods and droughts have an insignificant impact on overall agricultural production at the national level, yet typhoons may have a significant negative impact on paddy rice production at the provincial level; b) typhoons, as exemplified by Ondoy and Pepeng in 2009, have a significant negative impact on the food security of the households in the affected areas; c) households have varying consumption and non-consumption strategies to cope with the impacts of typhoons; and d) the different impacts of typhoons, floods and droughts on the natural resources and environment have not been quantitatively assessed in detail,
  however available evidence suggests that these are also substantial. Based on its results and findings, the study recommends the following: a) Since typhoons may have significant negative impacts on rice production at the local level as opposed to the national level, assistance for rice farmers and the agriculture sector as a whole should be made more site-specific, zeroing in on the affected areas that actually need it; b) Those assisting affected households and areas in overcoming the resulting ill-effects of natural disasters should consider not only consumption strategies, such as the provision of emergency food aid, but also non-consumption strategies, such as the provision of post-disaster emergency employment; and c) While the available evidence suggests that the natural resources and environment sector is significantly affected by natural disasters, it is currently less considered, as attention is presently focused on agriculture. It may now be high time to provide concrete assistance to this sector, in particular the provision of defensive investments and rehabilitation expenditures to cope with these natural disasters.
  Plan_Components : Research

- **Environmental Benefits Of Clean Water State Revolving Fund Green Infrastructure Projects**
  Organization : EPA

Year : 2018
Document_type : General Resource/ Foundational Research, Funding Opportunities
Disasters : Flood, Man-Made Disasters
Abstract : Across the United States there is increasing awareness of the need to address pollution generated by stormwater runoff. As stormwater moves through the landscape it captures and carries trash, bacteria, heavy metals, and other pollutants from the urban environment. These pollutants degrade the quality of receiving waters and threaten public health. Stormwater can also cause erosion and flooding, damaging wildlife habitat, property, and infrastructure. This resource offers case study examples of different practices throughout the country using green infrastructure to help mitigate flooding and stormwater runoff.
Plan_Components : Funding Mechanisms, Case Studies, Green Infrastructure

- **2010 – 2035 Comprehensive Plan**
  Organization : Sangamon County Regional Planning Commision
  Year : 2011
  Document_type : Specific Plan
  Disasters : Tornado, Flood, Drought, Extreme Weather, Earthquakes, Soil Erosion/Landslides
  Abstract : The plan is designed to show the Village's past and present conditions and also to highlight scenarios that the Village may pursue to further enhance our community in the future years. We have studied the plan and have worked to offer long term guidance in the critical planning areas that will enhance our community.
  Plan_Components : Planning Processes, Green Infrastructure

- **Impacts Of Natural Disasters In Agriculture, Rangeland And Forestry: An Overview**
  Year : 2005
  Document_type : Scientific Article
  Disasters : Extreme Weather, Agricultural Disasters
  Abstract : Natural disasters play a major role in agricultural development and the economic cost associated with all natural disasters has increased 14 fold since the 1950s. Natural disasters are classified into hydro-meteorological and geophysical disasters. Definitions of various types of hydrometeorological disasters such as floods, droughts, cyclones, forest fires, heatwaves were presented. Evidence available from different parts of the world showed that there is a rising trend in the occurrence of natural disasters from 1993 to 2002. Impacts of droughts, cyclones, floods, forest and bush fires on agriculture, rangeland and forestry were described with suitable examples. While the predominant impacts from these disasters are negative, there are some positive impacts as well. Environmental degradation is one of the major factors contributing to the vulnerability of agriculture, forestry and rangelands to natural disasters because it directly magnifies the risk of natural disasters. Some methodological issues concerning the characterization of the impacts of natural disasters in agriculture, rangeland and forestry were described. There is an urgent need to mitigate the effects hydro-meteorological disasters through improved use of climate and weather information and forecasts, early warning systems, and appropriate methods of management of land and natural resources.
  Plan_Components : Research

Appendix A

Interpretation of High Risk and Low Risk Areas at County Level

Indicator	Definition	Low Risk Interpretation	High Risk Interpretation	Risk Level
Population	Total Population	A small number of people will be affected by a disaster	A large number of persons will be affected by the disaster	Very High
Young_percent	Percentage of Young Persons	A small percentage of children would mean less vulnerability to disasters	A large percentage of children would indicate a greater vulnerability to disasters	Very High
Old_percent	Percentage of Elders**	A lower percentage population of elders indicates a lower vulnerability.	A higher percentage of elder population indicates a greater vulnerability, owing to physical infirmities, functional limitations and care needs.	Very Low
NonWhite_Percent	Percentage of Non-White Popula-tion**Minority Populations, add Hispanic Population	A lower population of ethnic minorities might indicate a less diverse population. However, in case of disaster vulnerability, a lower population of racial minorities has been represented as a lower vulnerability, owing to its correlations with poverty and health care outcomes.	Race and ethnicity are highly correlated with poverty and thus often with health outcomes. Owing to historical, systemic and structural barriers, racial minorities are often more susceptible to disasters and often lack the support mechanisms required to cope. As a result, a higher population of racial or ethnic minorities might (in conjunction with income, poverty, employment, education and other indicators) represent a greater vulnerability.	Very High

(continued)

Indicator	Definition	Low Risk Interpretation	High Risk Interpretation	Risk Level
Females_Percent	Percentage of Females	A good percentage of women represent a stable sex ratio for the area and is therefore a positive indicator	A low percentage of women could indicate an unstable sex ratio, thereby showing that there are fewer opportunities for women in the area. This could have negative consequences during a disaster	Low
NotMarried_Percent	Percentage of Unmarried Persons	A lower percentage of unmarried individuals could indicate a lower vulnerability to disasters owing to the availability of social support that comes with having a family	A higher percentage of unmarried individuals could indicate lack of family and social support.	Very High
Disabled_Percent	Percentage of Disabled Persons	A lower percentage of disabled individuals in the community indicates a lower risk owing to reduced requirements for preparation, disaster and accessibility planning	A higher percentage of disabled individuals is associated with a high risk. They are disproportionately affected owing to inaccessible evacuation, response and recovery efforts and could often be left behind.	High
FemaleHeaded_HHs_Percent	Percentage of Households with Female Householder	A lower percentage of female headed households indicates a lower disaster risk, a more stable family and household structure, greater social integration and family support, and higher socio-economic status at the community level	A higher percentage of female headed households could indicate a higher disaster risk owing to greater chances of poverty, and particular risk from housing shocks and stresses, hunger and food insecurity owing to gender discrimination	Low

(continued)

Indicator	Definition	Low Risk Interpretation	High Risk Interpretation	Risk Level
LargeFam_Percent	Percentage of Large Families as part of all Families	In case of smaller family sizes, a greater investment of the family's resources is possible leading to greater achievements. Therefore a smaller proportion of big families is a reduced social vulnerability during disasters	In case of large families, the same limited resources are shared by a large group of individuals owing to less investment per person. This can result in differential academic achievements and occupational performance. Thus prevalence of a bigger family size would indicate a higher disaster risk.	Very High
SingleParent_Percent	Percentage of Single Parent Households	A lower proportion of single parent households indicates a lower disaster vulnerability, owing to lesser probability of financial, academic and behavioural problems which have been correlated with single parent households.	Children living in single-parent households have greater risks to their physical and social health and wellbeing compared with other family structures such as two parent or grandparent headed households. Thus, a greater proprotion of single parent households represents a higher disaster risk	Very High
Educated_percent	Percentage of Educated Persons	A greater person of educated individuals is interpreted as low disaster risk	Lack of education is associated with social marginalization, lack of preparation and disaster planning. Therefore a lower percentage of educated individuals is interpreted as high risk.	High

(continued)

Indicator	Definition	Low Risk Interpretation	High Risk Interpretation	Risk Level
Skilled_Percent	Percentage of Skilled Persons	A higher number of skilled individuals represents a lower disaster risk	Lack of occupational skill is associated with lower incomes and employment benefits and therefore less resources for disaster recovery. Therefore, a lower percentage of skilled workers indicates a greater disaster risk.	Moderate
Elderly_growth_percent	Growth Percent of Elderly Population	A lower percentage of older adults represents a lower disaster risk.	Older adults are more vulnerable to dosaster risks owing to functional problems, health and medication concerns. A greater percentage of older adults represents a higher risk.	High
Working_Nonworking_ratio	Ratio of Working to Non-working Population	A high ratio indicates lower risk	This ratio indocates the amount of labor resources available in the market, and signals unemployment, income and other economic factors. A low ratio indicates a lower economic resilience to market shocks and is therefore high risk.	High
HelperPool	Percentage of Helpers in a time of crisis	A higher proportion of helpers indicates a lower risk, since a greater number of persons will be available for disaster recovery and mitigation efforts.	A goood number of participants in the helper pool could indicate greater support and emergency management in the community. A lower percentage of helpers represents a high risk.	Very Low

(continued)

Indicator	Definition	Low Risk Interpretation	High Risk Interpretation	Risk Level
FemaleLaborforce_percent	Percentage of Labor Force constituted by Women	A higher particpation of females in the workforce indicates increased incomes, and lowers or leads to sharing of unpaid care-work with other members of the family, leading to a more economically resilient community. Thus a higher female workforce particpation indicates a low disaster risk	A lower particpation of women in the labour force is associated with lower household incomes and poverty. Therefore a lower female workforce particpation means a higher disaster risk owing to lower economic support.	Low
PrimeWorkingAge_percent	Percentage of population in Prime Working Age	A greater number of persons of working age indicates a greater labour pool available for the local economy. Therefore a higher ratio indicates a lower risk.	A lower number of persons of working age represents a greater number of dependents on the existing workfore and is hence a high risk.	Very High
Avg_HHsize	Average Household Size	A smaller average household size indicates a greater proportion ofhousehold resources available to every individual in the household and is therefore a lower risk	Household sizes relate with the distribution of resources among individuals with the household. A greater average household size indicates a lesser proprotion of resources available to individuals and is therefore interpreted as a high risk	Very High

(continued)

Indicator	Definition	Low Risk Interpretation	High Risk Interpretation	Risk Level
Percent_BachelorsDegree	Percentage of Population with Bachelors' Degree	A greater proportion of persons with bachelors' degree indicates a greater likelihood of being employed by a variety of employers, along with a higher concentration of high skilled high income positions. Therefore it is interpreted as a lowrisk	A lower porportion of persons with a bachelor's degree indicates a lower number of persons with skills for career advancement. It indicates lack of skilled labour in the workforce and tehrefore lower incomes and social mobility. Therefore it is interpreted as a high risk factor	Moderate
Percent_LanguageBarrier	Percentage of Population facing Language Barrier	A lower proportion of persons with language problems indicates greater accessibility to disaster relief efforts and is therefore an area of lowe risk	A higher proportion of persons with language barriers could indicate a higher percentage of people suffering due to communication problems, interpretation of instructions and emergency rescue operations. Therefore it is interpreted as a high risk	Low
Percent_AssistanceNeed	Percentage of Population with Assisstance Need	A lower percentage of people withfood assistance indicates higher incomes and economic resilience, and is therefore a low risk area	A high proportion of persons with assistance needs indicates poverty and lack of socio-economic resilience. Therefore it is interpreted as a high risk.	Very High

(continued)

Indicator	Definition	Low Risk Interpretation	High Risk Interpretation	Risk Level
Percent_Commuters	Percentage of Population who Commute to work regularly	A lower percentage of commuters indicates that most workers live near where they work and can continue their jobs irrespective of transportation network disruptions. Therefore it is an area of low risk	Natural disasters invariably affect transportation routes and make it difficult for persons requiring commutes to their workplace to continue their employment. Therefore a greater proportion of commuters indicates a disaster risk	Very High
Percent_NoHealthIns	Percentage of Population without Health Insurance	Greater health insurance coverage is correlated with better health conditions and higher economic productivity. Therefore a higher number of persons with health insurance is a low risk	Lack of health insurance coverage has negative impacts on health as patients are less likely to receive preventive health care, or affordable medical care during a disaster. A greater proportion of persons without health insurance indicates a higher disaster risk.	Low
Physically_UnhealthyDays	Average number of physically unhealthy days per year for the population	A Lower value is associated with low risk	A higher value is associated with high risk because people are more prone to being affected by disaster risks	Moderate
Food_Environment_Index	Index of factors that contribute to a healthy food environment, from 0 (worst) to 10 (best).	A higher value is associated is low risk	A poor food environment reduces the physical and mental vitality of a community. A lower value is associated with high risk.	Moderate

(continued)

Indicator	Definition	Low Risk Interpretation	High Risk Interpretation	Risk Level
Percent_Exercise_Access	Percentage of population with adequate access to locations for physical activity.	A higher value is associated is low risk	Lower physical exercise increases health risks with age. A lower value is associated with high risk	Very Low
PrimaryCare_Physicians_Rate	Ratio of population to primary care physicians.	A higher value is associated is low risk	A lower proportion of physicians indicates that community members may not have access to medical help during disasters and have to rely on external support. A lower value is associated with high risk	Moderate
MentalHealth_Providers_Rate	Ratio of population to mental health providers.	A higher value is associated is low risk	A lower proportion of physicians indicates that community members may not have access to mental health resources during disasters. A lower value is associated with high risk	Moderate
Percent_Vaccinated	Percentage of Households vaccinated against Covid-19 and other diseases	A higher value is associated is low risk	A high proportion of vaccination indicates that the community is safe against the Covid-19 pandemic. A lower value is associated with high risk	Low
Social_Association_Rate	Number of membership associations per 10,000 population.	A higher value is associated is low risk	A high rate of social associations indicates healthy relationships and community life. A lower value is associated with high risk	Very High

(continued)

Indicator	Definition	Low Risk Interpretation	High Risk Interpretation	Risk Level
Violent_Crime_Rate	Number of reported violent crime offenses per 100,000 population.	A Lower value is associated with low risk	A high of crimes indicates safety issues within the community. A higher value is associated with high risk	High
Inadequate_Facilities	Percentage of households with inadequate infrastructure within their housing unit	A Lower value is associated with low risk	Inadequate infrastructure within the household lowers quality of life and residents' health. A higher value is associated with high risk	High
COVID-19_death_rate	All deaths occurring between January 1, 2020 and December 31, 2020 due to COVID-19, per 100,000 population (age-adjusted).	A Lower value is associated with low risk	A greater number of deaths owing to Covid-19 indicates pre-existing health conditions and comorbidities within the community. A higher value is associated with high risk	Moderate
Percent_Food_Insecure	Percentage of population who lack adequate access to food.	A Lower value is associated with low risk	Access to food indicates community health. A higher value is associated with high risk	Moderate
Percent_Limited_Access_to_Healthy_Foods	Percentage of population who are low-income and do not live close to a grocery store.	A Lower value is associated with low risk	Persons who are low income lack access to healthy food, especially if they live away from grocery stores and lack transportation. A higher value is associated with high risk	Moderate

(continued)

Indicator	Definition	Low Risk Interpretation	High Risk Interpretation	Risk Level
Percent_Disconnected_Youth	Percentage of teens and young adults ages 16-19 who are neither working nor in school.	A Lower value is associated with low risk	Teens and young adults need to either be in school, or part of the workforce, to be able to cultivate a healthy, self-sufficient lifestyle, involved hopeful and forward looking endeavours. Disconnected youth have been positively associated with poverty, unempoyment and crime. A higher value is associated with high risk	Very High
Percent_rural	Percentage of population living in rural areas	A Lower value is associated with low risk	Rural areas often lack access to resources and are geogrpahically isolated. A higher value is associated with high risk	Low
Agro_Percent	Percentage Employment in Agriculture and related Sectors	A lower percentage of workers in the agricultural sector indicates a greater economic diversity, lower dependence on weather conditions, higher resilience and lower risk	Agricultural sector is most directly affected by natural disasters and extreme weather events such that their productivity goes down drastically. Therefore a predominantly agrarian economy represents lower economic resilience and greater disaster risk	High

(continued)

Indicator	Definition	Low Risk Interpretation	High Risk Interpretation	Risk Level
LowIncome_Percent	Percentage Low Income Population	A lower proportion of low income families indicates a greater access to resources for preparation and recovery from disasters and is hence a low disaster risk	A higher proportion of low income households lack of adequate access to resources to prepare for and recover from disasters, contingency funds, personal vehicles and abilities to arrange for alternate housing arrangements during disasters. It is therefore a high risk.	Moderate
poverty	Percentage Below Poverty Line	A lower poverty indicates less exposure to disaster risks and greater accessibility to exigency funds. It is therefore a low risk	Poverty can be both a cause and consequence of disaster risk. A greater poverty is associated with a higher risk	Low
Unemployment_percent	Percentage of Unemployed Persons	A lower rate of unemployment indicates a more stable and resilient economic environment and is therefore associated with lower disaster risks	A high rate of unemployment could indicate a range of socio-economic vulnerabilities and political struggles. It indicates lower economic resilience during disasters and is therefore associated with high risk	Very High
WorkNearby_percent	Percentage Workers who live near their place of work	A greater proportion of persons who live near their place of work indicates a lower dependence on commute and transportation networks and a more robust resilient economy. Therefore it is a low risk	A lower proprotion of persons who live near their place of work indicates a high dependence on transportation networks for economic activities and a greater risk of disruption during disasters. It is therefore a high risk	Low

(continued)

Indicator	Definition	Low Risk Interpretation	High Risk Interpretation	Risk Level
MBS	Percentage Employed in Management, Business and Science Occupations	Management, Business and Science jobs are invariably correlated with greater incomes, social mobility and lower dependence on place-based work. Therefore they are more resilient during disasters and higher employment in these sector represent lower risks	A lower proportion of employees in Management, Business and Science professions indicates lower incomes and a low skill economy and is therefore indicative of higher disaster risks	Very Low
MBS_LQ	Location Quaotient of Managemnt, Business and Science Occupations	A high Location Quotient for Management, Business and Science professions indicates a more specialized, high income economy. It is indicative of low disaster risk	A low LQ for Management, Business and Science professions indicates a less specialized economy and is therefore indicative of lower economic diversity, lower incomes and high risk	Low
Service	Percentage Employed in Service	Service sector is a huge contributor to the economic productivity and bolsters the primary and secondary economic sectors as well and provides a huge source of employment. A higher employment in the service sector signals greater economic resilience and lower risk.	A lower proportion of workers in the service sector indicates a less developed and resilient economy with greater dependence on place-based work. It is therefore an area of high risk.	Very Low
Service_LQ	Location Quotient of Service Occupations	A higher LQ for the service sector indicates a high risk	A lower LQ for the service sector indicates a lower resilience and higher risk	Moderate

(continued)

Indicator	Definition	Low Risk Interpretation	High Risk Interpretation	Risk Level
Sales	Percentage Employed in Sales Occupations	Employment in sales is associated with higher pay greater skills and organizational support. It signals greater economic resilience and low risk	A lower employment in sales industries could indicate a less entrepreneurial economy, lower resilience and therefore higher disaster risk	Very Low
Sales_LQ	Location Quotient of Service Occupations	A higher LQ for the service sector indicates a low risk	A lower LQ for sales industries is associated with high risk	Very Low
construction	Percentage Employed in Construction Occupations	Construction and allied industries represent possibilities for robust economic growth and government investment. A greater employment in the construction industry also signals potential for development of local infrastrcuture. A higher employment in this sector is therefore a low risk	Lower employment in the construction sector indicates lower investment in built environment and infrastructure and high disaster risks	Very Low
construction_LQ	Location Quotient of Construction Occupations	A higher LQ for the construction industry indicates a low disaster risk	A lower LQ for the construction industry indictes a high disaster risk	Very High
PT	Percentage Employed in Production and Trans-portation Occupations	A lower concentration of production and transportation industries indicates a lower dependence of the economic base on land, location and natural resources. It is therefore more economically resilient and a low risk	Both production and transportation industries are dependent on avaibality of local natural resources and are therefore more susceptible to natural disasters. A higher employment in such industries signals greater disater risk.	Very High

(continued)

Indicator	Definition	Low Risk Interpretation	High Risk Interpretation	Risk Level
PT_LQ	Location Quotient of Production and Transportation Occupations	A lower concentration of the production and transportation idnustry indicates a low risk	A higher LQ for the Production and Transportation Industry indicates a high risk	High
Agri	Percentage Employed in Agricultural Occupations	A lower percentage of workers in the agricultural sector indicates a greater economic diversity, lower dependence on weather conditions, higher resilience and lower risk	Agricultural sector is most directly affected by natural disasters and extreme weather events such that their productivity goes down drastically. Therefore a predominantly agrarian economy represents lower economic resilience and greater disaster risk	Very High
Agri_LQ	Location Quotient of Agricultural Occupations	A lower LQ for the Agricultural Sector indicates a low risk	A higher LQ for Agricultural Businesses indicates a higher risk	High
Manufacturing	Percentage Employed in Manufacturing Occupations	A lower concentration of manufacturing industries/employment indicates lower chances of disruption during disasters. It is therefore an area of low risk	Manufacturing industries are directly affected by natural disasters. Extreme events cause great damage to the manufacturing units and their associated supply chains. A higher concentration of Manufacturing Industries is associated with high risk	Very High
Manufacturing_LQ	Location Quotient of Manufacturing Occupations	A lower LQ for manufacturing industries indicates a low risk	A higher LQ for manufacturing industries indicates a high risk	High

(continued)

Indicator	Definition	Low Risk Interpretation	High Risk Interpretation	Risk Level
Wholesale	Percentage Employed in Wholesale Trade	A lower employment in wholesale businesses signals a greater economic resilience and low risk	Wholesale and retail businesses are more vulnerable to natural disasters and are more likely to close after disasters. They are also more likely to be low mitigators. A higher proportion of employment in the wholesale industry signals a high disaster risk	Very High
Wholesale_LQ	Location Quotient of Wholesale Trade Occupations	A lower LQ in wholesale industries is associated with low risk	A higher LQ is wholesale industries is associated with high risk	Very High
Retail	Percentage Employed in Retail Occupations	Although prone to natural disasters, retail industries generally show a higher resilience to natural disasters than wholesale industries. This is because they are less likely to be low mitigators and often associated with having a plan unlike wholesale industries. Thus a higher employment in retail industries is associated with low risk.	A lower employment in retail industries signals lower economic resilience and is associated with higher risk	Very Low
Retail_LQ	Location Quotient of Retail Occupations	A higher LQ in retail industries is associated with low risk	A lower LQ in retail industries is associated with high risk	Low

(continued)

Indicator	Definition	Low Risk Interpretation	High Risk Interpretation	Risk Level
Transport	Percentage Employed in Transportation Occupations	Like retail, transportation businesses are often associated with having business plans, more structurally sound and meets standards. Thus a higher employment in transportation indicates a low risk	A lower employment in transportation business could mean that the businesses are not widely spread out and less economically resilient. It is interpreted as a high risk.	Very Low
Transport_LQ	Location Quotient of Transportation Occupations	A higher LQ in transportation industries is associated with low risk	A lower LQ in transportation industries associated with high risk	Moderate
Info	Percentage Employed in Information-based Occupations	Information industries are positively associated with mitigation planning and have the ability to shift to remote working during a disaster. Therefore, such a higher employment in such industries poses a low risk	A lower employment in infirmation industries signals a less diverse economic base and a higher susceptibility to natural disasters. It is therefore associated with higher disaster risks	Very Low
Info_LQ	Location Quotient of Information-based Occupations	A lower LQ in the information sector signals a low risk	A lower LQ in information sector signals a high risk	Very Low

(continued)

Indicator	Definition	Low Risk Interpretation	High Risk Interpretation	Risk Level
Finance	Percentage Employed in Finance Occupations	Finance, realestate, etc. jobs are positively correlated with high incomes, job security and high economic resilience during disasters. Therefore a greater employment ins uch industries poses a low risk and indicates a diverse economic base. A higher employment in such industries is associated with a low risk	A lower employment in finance, real estate etc. signals lower incomes and less resilient jobs. Therefore, a lower employment in this sector is associated with high risk	Very Low
Finance_LQ	Location Quotient of Finance Occupations	A high LQ in finance, real estate, etc. signals a low risk	A low LQ in finance, real estate, etc. signals a high risk	Low
Management	Percentage Employed in Management Occupations	Management, Business and Science jobs are invariably correlated with greater incomes, social mobility and lower dependence on place-based work. Therefore they are more resilient during disasters and higher employment in these sector represent lower risks	A lower proportion of employees in Management, Business and Science professions indicates lower incomes and a low skill economy and is therefore indicative of higher disaster risks	Moderate
Management_LQ	Location Quotient of Management Occupations	A higher LQ in management, business, or science indicates a low risk	A lower LQ in Management, business or science indicates a high risk	Very High

(continued)

Indicator	Definition	Low Risk Interpretation	High Risk Interpretation	Risk Level
Edu	Percentage Employed in Education-related Occupations	A higher employment in the education sector signals a more skilled economy, which is typically more resilient to natural disasters. It is therefore a low risk	A lower employment in the education sector signals a less resilient, less skilled economy, and is therefore associated with high risk	Very Low
Edu_LQ	Location Quotient of Education-related Occupations	A high LQ in the education sector signals a higher economic resilience and low risk	A lower LQ in education sector signals a lower economic resilience and high risk	Low
Arts	Percentage Employed in Arts Occupations	A lower employment in the arts sector could indicate higher resilience to economic shocks and higher incomes and is therefore associated with lower risk	Although a higher proportionof artists could signal a greater economic diversity, arts occupations are highly susceptible to natural disasters. Therefore a greater employment in arts industries could signal a higher disaster risk.	Very High
Arts_LQ	Location Quotient of Arts Occupations	A low LQ in the arts sector is associated with low risk	A high LQ in the arts sector is associated with higher risk	High
Others	Percentage Employed in Other Occupations	Employment across other sectors represents diversification of the economic base and is therefore positively correlated with economic resilience. It is therefore a low risk	A lower employment in other sectors represents a less diverse and creative economy. It is therefore associated with high risks	Moderate
Others_LQ	Location Quotient of Other Occupations	A higher LQ in other industries is associated with low risk	A lower LQ in other industries is associated with high risk	Very High

(continued)

Indicator	Definition	Low Risk Interpretation	High Risk Interpretation	Risk Level
CommuteTime	Time it takes from home to go to work in minutes	A Lower value is associated with low risk	Time spent in commute is associated with lack of productivity and extra expenses. A lower commute time is assocatied with a health local economy. A higher value is associated with high risk	Moderate
Walkability_Score	Walkability score (ordinal)	A higher value is associated is low risk	High walkability scores indicate greater community vitality and economic accessibility. A lower value is associated with high risk	High
Vice_related_business_rate	Rate of vice-related businesses per county as proportion of total businesses	A Lower value is associated with low risk	Greater proportion of vice-related business indicate hightened economic instability during disasters. A higher value is associated with high risk	Very Low
Civic_related_business_rate	Rate of civic-related business per county	A higher value is associated is low risk	Civic-related businesses indicate a strong, built-environment and development industry. A lower value is associated with high risk	Low
Education_related_business_rate	Rate of education-related business per county	A higher value is associated is low risk	Education-related businesses enable a community to obtain access to education and child development resources. A lower value is associated with high risk	High

(continued)

Indicator	Definition	Low Risk Interpretation	High Risk Interpretation	Risk Level
Healthcare_related_business_rate	Ratio of healthcare-related businesses per county	A higher value is associated is low risk	Availability of health care businesses indicate access to medical resources during disasters. A lower value is associated with high risk	Moderate
Recreation_related_business_rate	Ratio of recreation-related businesses per county	A lower value is associated with low risk	Greater proportion of recreation-related business indicate hightened economic instability during disasters. A higher value is associated with high risk	Very High
Total	Total Housing Stock	A lower number of housing units indicates less damage during a disaster and is associated with low risk	A higher number of housing units indicates the possibility of greater risk during disasters	Very High
Homewownership	Perecentage Homewowners	A higher percentage of homeownership is associated with greater income and family stability and greater access to relief during a disaster. It is therefore a low risk	A lower percentage of homeownership signals lower incomes and support during disasters. It is therefore a higher risk.	Very High
OldHomes	Percentage of Old Homes as part of Total Housing Stock	A lower proportion of old homes signals new construction that is more structurally resilient to natural disasters. It is therefore associated with low disaster risk	A higher proportion of houses that are built more than 30 years ago signals an old housing stock in need of repair and reconstruction. It is therefore associated with high disaster risk.	Low

(continued)

Indicator	Definition	Low Risk Interpretation	High Risk Interpretation	Risk Level
NewHomes	Percentage of New Homes as part of Total Housing Stock	A higher proprotion of new homes indicates a greater structural resilience to natural disasters and is associated with a low risk	A lower porportion of new homes indicates the possibility of greater structural damage during disasters. It is therefore associated with a high risk	Low
Rented	Percentage Renters	A lower proportion of renters signals greater homeownership, higher incomes and access to resources. This is therefore an area of low risk	Renters are associated with higher vulnerability during disasters owing to lower incomes, and lesser accessibility to disaster relief. A high proportion of renters is therefore associated with a higher risk	Very High
Vacancy	Percentage Vacant Units	A lower proportion of vacant units signals greater utilization of available built environment resources, greater maintenance and lower probability of structural damage. It is therefore associated with low risk	A high proportion of vacant units signals a weak economic base and possibilities of blight and structural damage. It is therefore associated with a high risk	Moderate
Units_SingleFamily	Percentage of Single Family Units	A lower porportion of single family units signals greater housing mix, affordability and greater housing resilience. It is therefore associated with low risk	A greater proportion of single family homes signals lesser housing diversity and therefore higher risks for low income populations. It is associated with higher risk	Low
MobileHomes	Percentage of Mobile Homes as part of Total Housing Stock	A lower proportion of mobile homes indicates greater structural resilience of the housing sector and more stable economy	A greater proportion of mobile homes is associated with greater risk owing to structural problems and lower incomes.	Moderate

(continued)

Indicator	Definition	Low Risk Interpretation	High Risk Interpretation	Risk Level
Overcrowding	Percentage of Overcrowded Homes as part of Total Housing Stock	A lower proportion of vercrowded units signals higher incomes and well-maintained, structurally sound housing units which are resilient to disasters. It is therefore associated with low risk	In an overcrowded housing unit, available resources are distributed among a higher than average number of individuals which could lead to familial, socio-economic and structural inadequacies over a period of time. It is therefore associated with high risk.	Low
Rental_Overcrowding	Percentage of Rental Units that are Overcrowded	A lower proportion of overcrowded rental units indicates a more affordable rental housing stock, and a more resilient rental population. It is a low risk	A higher proportion of rental units which are overcrowded signals lower incomes, structural and maintenance issues associated with the rental housing stock. It indicates that the rental stock is inadequate and unaffordable and is therefore associated with high risk	Very High
Cost_IncomeRatio	Ratio of Housing Cost to Household Income	A lower cost to income ratio indicates that households are successfully able to meet their financial demands and are more resilient to disasters. It is therefore a low risk.	A higher cost to income ratio indicates that households are unable to meet their financial needs and are more likely to suffer adversely during disasters. It is therefore associated with high risk.	Very High

(continued)

Indicator	Definition	Low Risk Interpretation	High Risk Interpretation	Risk Level
Renters_Cost_Income_Ratio	Ratio of Renter Housing Cost to Household Income	A lower cost to income ratio for renters indicates that rental households are successfully able to meet their financial demands and are more resilient to disasters. It is therefore a low risk.	A higher cost to income ratio for renters indicates that rental households are unable to meet their financial needs and are more likely to suffer adversely during disasters. It is therefore associated with high risk.	Very Low
Rental_CostBurden_Below20000	Housing Cost Burden on renters whose incomes are below 20,000 USD	A lower proportion of cost-burdened low income households indicates greater economic resilience among low-income renters. This is an asset during natural disasters and is a low risk area	A higher proportion of low income rental households who are housing cost burdened signals a higher concentration of highly vulnerable households in the community. This is an area of high risk, structurally, financially and socially	Very High
Renter_MHHI	Monthly Household Income of Renters	A higher income indicates greater capacity to cope with disasters. It is therefore associated with low risk.	A lower income indicates a lower capacity to cope with disasters and is associated with high risk	Low
MedianHomeValue	Median Home Value	A higher home value indicates higher incomes, higher accessibility to funds during disaster and is therefore associated with low risk	A lower home value indicates lower incomes and is therefore associated with high risk	Very Low
NoVehicle_Pop	Percentage of Households without a Vehicle	A lower percentage of households without a vehicle indicates greater socio-economic stability within the community and is therefor associated with low risk	Vehicles count as additional economic assets which add to household mobility. A higher percentage of households without a vehicle is therefore associated with a high risk	Very Low

(continued)

Indicator	Definition	Low Risk Interpretation	High Risk Interpretation	Risk Level
GroupQuarters	Percentage of GroupQuarters as part of Total Housing Stock	A lower concentration of group quarter residents is a low risk owing to greater access to recovery resources and social support	Group quarters consist of unrelated persons sharing a living space, either in institutionalized or non-institutionalized settings. Thus they lack the social support of a family and a high percentage of group quarter population is associated with high risk	Very High
Percent_Section8	Rate of low-rent + section-eight units in county	A Lower value is associated with low risk	Greater proportion of low income housing indicates poverty and declining housing quality. A higher value is associated with high risk	Moderate

Appendix B

High Risk and Low Risk Areas at Rural, Urban and Census Place Levels

Indicator	Risk Level (Rural)	Risk Level (Urban)	Risk Level (Places)
Population	Low	Low	High
Young_percent	Moderate	High	High
Old_percent	Low	Moderate	Low
NonWhite_Percent	Very High	Moderate	Very High
Females_Percent	Very High	Moderate	High
NotMarried_Percent	High	High	High
Disabled_Percent	High	Very High	Very High
FemaleHeaded_HHs_Percent	High	High	Moderate
LargeFam_Percent	High	High	Very High
SingleParent_Percent	Moderate	Very High	High
Educated_percent	Moderate	Very High	Moderate
Skilled_Percent	High	Very High	Low
Elderly_growth_percent	Moderate	Moderate	High
Working_Nonworking_ratio	High	High	Moderate
HelperPool	High	High	Moderate
FemaleLaborforce_percent	High	Moderate	Moderate
PrimeWorkingAge_percent	Very High	Moderate	Very High
Avg_HHsize	Very High	High	Very High
Percent_BachelorsDegree	Very High	Very High	Moderate
Percent_LanguageBarrier	Low	Very Low	Moderate
Percent_AssistanceNeed	High	High	High
Percent_Commuters	Moderate	High	Moderate
Percent_NoHealthIns	Low	Moderate	Moderate
Physically_Unhealthy_Days	Moderate	Very High	Moderate
Food_Environment_Index	Moderate	Moderate	Moderate
Percent_Exercise_Access	Very Low	Moderate	Very Low
PrimaryCare_Physicians_Rate	Moderate	High	Moderate
MentalHealth_Provider_Rate	Moderate	High	Moderate
Percent_Vaccinated	Low	High	Low
Social_Association_Rate	Very High	Moderate	Very High

(continued)

Indicator	Risk Level (Rural)	Risk Level (Urban)	Risk Level (Places)
Violent_Crime_Rate	High	High	High
Inadequate_Facilities	High	Very High	High
COVID-19_death_rate	Moderate	Very High	Moderate
Percent_Food_Insecure	Moderate	High	Moderate
Percent_Limited_Access_to_Healthy_	Moderate	Moderate	Moderate
Percent_Disconnected_Youth	Very High	Very High	Very High
Segregation_index	Very High	Very High	Very High
Percent_rural	Low	High	Low
Income	High	High	Low
Agro_Percent	High	Moderate	High
UnstableEmployment_percent	Moderate	Very High	Low
LowIncome_Percent	Low	High	Very Low
poverty	Moderate	High	Low
Unemployment_percent	Low	High	Moderate
WorkNearby_percent	Moderate	High	Low
MBS	High	Very High	Low
MBS_LQ	Moderate	Moderate	Low
Service	Moderate	Moderate	Very Low
Service_LQ	Moderate	High	Low
Sales	Very Low	Low	Low
Sales_LQ	Low	Very Low	Very Low
construction	High	Moderate	High
construction_LQ	High	Moderate	High
PT	Moderate	Moderate	High
PT_LQ	Moderate	High	High
Agri	High	Moderate	Very High
Agri_LQ	High	Moderate	High
Manufacturing	Low	Very Low	High
Manufacturing_LQ	Low	Moderate	Moderate
Wholesale	Very High	High	Very High
Wholesale_LQ	Very High	High	Very High

(continued)

Indicator	Risk Level (Rural)	Risk Level (Urban)	Risk Level (Places)
Retail	Moderate	High	Low
Retail_LQ	Low	Moderate	Low
Transport	Moderate	Very High	Low
Transport_LQ	Moderate	Very High	Low
Info	High	High	Low
Info_LQ	Moderate	Moderate	Very Low
Finance	Very High	Very High	Low
Finance_LQ	Very High	Very High	Low
Management	Low	High	Low
Management_LQ	Very Low	Moderate	Moderate
Edu	Very High	Moderate	Moderate
Edu_LQ	High	Moderate	Moderate
Arts	Moderate	Very Low	Very High
Arts_LQ	High	Moderate	Very High
Others	Moderate	High	Very Low
Others_LQ	Moderate	Moderate	Low
Percent_Children_in_Poverty.x	Low	Low	Low
Gender_Pay_Gap.x	Moderate	High	Moderate
Percent_income_required_for_childca	Low	Low	Low
CommuteTime	Moderate	High	Moderate
Walkability_Score	High	Low	High
Vice_related_business_rate	Very Low	Low	Very Low
Civic_related_business_rate	Low	Moderate	Low
Education_related_business_rate	High	Moderate	High
Healthcare_related_business_rate	Moderate	Moderate	Moderate
Recreation_related_business_rate	Very High	High	Very High
Total	Very Low	Low	High
Homewownership	High	High	Moderate
OldHomes	Moderate	Very High	Low
NewHomes	Moderate	Very High	Low
Rented	High	High	Very High
Vacancy	Moderate	High	Low

(continued)

Indicator	Risk Level (Rural)	Risk Level (Urban)	Risk Level (Places)
Units_SingleFamily	High	Low	High
MobileHomes	Moderate	Low	Very Low
Overcrowding	Very Low	High	Moderate
Rental_Overcrowding	Low	High	Moderate
Cost_IncomeRatio	Very Low	Very Low	High
Renters_Cost_IncomeRatio	Moderate	Very High	Moderate
Rental_CostBurden_below20000	High	High	Very High
Renter_MHHI	Very Low	Moderate	Very Low
MedianHomeValue	Very Low	High	Very Low
NoVehicle_Pop	High	Moderate	Moderate
GroupQuarters	Moderate	High	Moderate
Percent_Children_in_Poverty.y	Very Low	Low	Very Low
Gender_Pay_Gap.y	Very Low	Very Low	Very Low
Percent_income_required_for_childca	Very Low	Very Low	Very Low
Percent_Section8	Moderate	Moderate	Moderate
Pubtrans_Dependent	High	Moderate	High
Pubtrans_heavilyDependent	High	Very High	Moderate
No_Pubtrans	Low	Moderate	Moderate
No_CommunicationSources	Very Low	Low	Very Low
Protective_Services	Very Low	High	Moderate
Percent_BroadbandAccess	Moderate	High	Moderate
pm10	High	High	High
pm25	High	High	Very High
o3	High	Moderate	High
so2	Low	Low	Low
nox	Very Low	Moderate	Very Low
co	Very Low	Very Low	Very Low
PCT_IRRIGATED_ACRES	Very Low	Very Low	Very Low
pct_nematode_acres	Very Low	Very Low	Very Low
pct_manure_acres	High	High	Very High
pct_disease_acres	Moderate	High	High
pct_defoliate_acres	High	Moderate	High

(continued)

Indicator	Risk Level (Rural)	Risk Level (Urban)	Risk Level (Places)
pct_harvested_acres	Very Low	Very Low	Very Low
pct_au	Very Low	Very Low	Very Low
fungicide	Very Low	Low	Very Low
herbicide	Low	Low	Low
insecticide	Very Low	Low	Very Low
std_coal_prim_pop	Low	Low	Low
std_metal_prim_pop	Moderate	Moderate	Moderate
std_nonmetal_prim_pop	Very Low	Very Low	Very Low
std_sandandgravel_prim_pop	Moderate	High	High
std_stone_prim_pop	Low	Very Low	Moderate
Radon	Low	Low	Low
Facilities_Rate	Moderate	Low	Moderate
Pct_BS	Moderate	Very High	Moderate
Pct_Unemp_total	Very Low	Very Low	Very Low
Pct_Fam_Pov	Low	Low	Low
Per_TotPopSS	Low	Low	Low
Per_PSWithSW	Very Low	Low	Very Low
D303_Percent	High	Very High	High
ALLNPDESperKM	Very Low	Moderate	Very Low
CaAve	Very Low	Low	Very Low
Kave	Moderate	High	Moderate
NO3Ave	Very Low	Very Low	Very Low
ClAve	Moderate	Low	Moderate
SO4Ave	Very Low	Very Low	Very Low
HgAve	High	Low	High
AvgOfD3_ave	High	Very High	High
W_As	Low	Low	Low
W_Ba	Moderate	Moderate	Moderate
W_Cd	Low	Low	Low
W_Cr	Low	Very Low	Low
W_CN	Low	Moderate	Low

(continued)

Indicator	Risk Level (Rural)	Risk Level (Urban)	Risk Level (Places)
W_FL	Moderate	Moderate	Moderate
W_HG	Moderate	Moderate	Moderate
W_NO3	Moderate	High	Moderate
W_NO2	Moderate	High	Moderate
W_SE	Low	Moderate	Low
W_SB	Low	Moderate	Low
W_ENDRIN	Moderate	Moderate	Moderate
W_METHOXYCHLOR	Moderate	Moderate	Moderate
W_DALAPON	Moderate	Moderate	Moderate
W_DEHA	Moderate	Moderate	Moderate
W_SIMAZINE	Moderate	Moderate	Moderate
W_DEHP	Moderate	Moderate	Moderate
W_PICLORAM	Moderate	Moderate	Moderate
W_DINOSEB	Moderate	Moderate	Moderate
W_ATRAZINE	Moderate	Moderate	Moderate
W_24D	Moderate	Moderate	Moderate
W_BENZOAP	Very Low	Very Low	Very Low
W_PCP	Moderate	Moderate	Moderate
W_PCB	Low	Moderate	Moderate
W_DBCP	Moderate	Moderate	Moderate
W_EDB	Moderate	Moderate	Moderate
W_XYLENES	Low	Moderate	Low
W_CHLORDANE	Moderate	Moderate	Moderate
W_DCM	Moderate	Moderate	Moderate
County_GEOID_ref	Moderate	High	NA