UNITED STATES COAST GUARD

2011 NATIONAL MARITIME STRATEGIC RISK ASSESSMENT

Overview Brief

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ABS Consulting

https://www.aferm.org/resource/united-states-coast-guard-2011-national-maritime-strategic-risk-assessment-2012/, https://www.aferm.org/wp-content/uploads/2016/10/ERM_2012_Toms_Mowrer_Risk_Response.pdf (retrieved 21 August 2017)

Risk is not just…

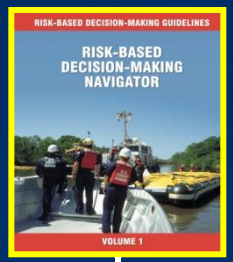
- Threat
- Vulnerability
- Likelihood of occurrence
- Consequence

Risk is …

- A function of likelihood *and* consequence
- An expected loss over time
- Is always relative to some goal or objective.
- Measure of performance
- Can be accepted, shared, transferred or mitigated, but
- Must not be ignored

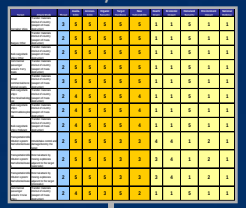
USCG Risk Management Timeline (1995 – 2003)

RBDM Guidelines
Comprehensive effort covering:
Design/Development
Roll-out training
Online tool/training
Risk Help Desk Support
Applications

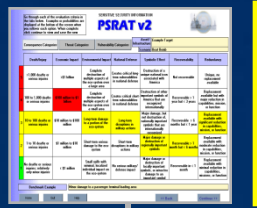


Flag Conference Brief on RBDM

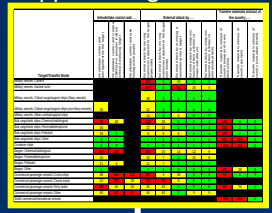
PS-RAT v1 fielded by VADM Allen in November 2001 after 9/11 attacks



PS-RAT v2 fielded



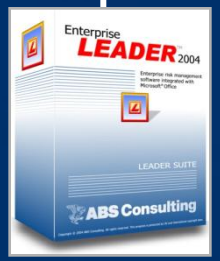
N-RAT developed to support budget build



USCG becomes part of DHS

1995 **2003**

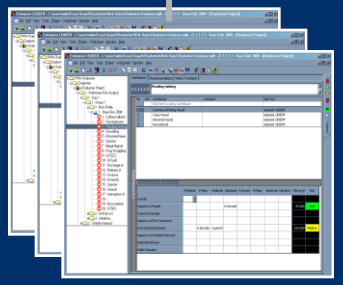
Release of EnterpriseLEADER
Desktop risk analysis software co-developed by ABS Consulting and USCG containing a wide array of analysis tools and capabilities spanning safety, security, and reliability



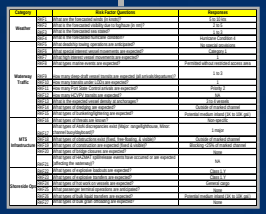
Port State Control Priority Boarding Matrix

Puget Sound Oil Spill Risk Assessment

IMO Large Passenger Ship Safety Initiative



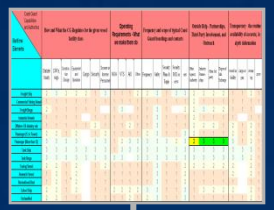
IRBDM projects to develop all-hazard risk, resource, and readiness profiles for Tampa, Miami, and Key West ports



Plan of the Day Prototype provides tactical risk assessment input

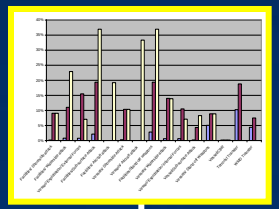
USCG Risk Management Timeline (2004-2009)

04 NMSRA

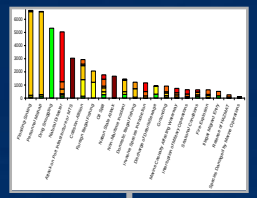


Risk-based Deepwater Defense

PWCS Strategic Planning/Outcome Measure



06 NMSRA



RBDM System Needs Assessment

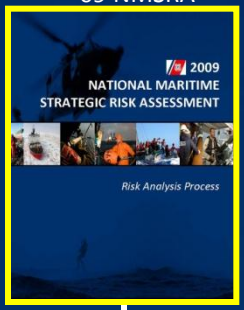
MSRAM Phase 2 fielded

MSRAM Phase 3 fielded

LORAM Methodology Development

MSRAM Phase 4 fielded

09 NMSRA



2004

G-CPD Stood up 8/05

2009

RPM project to develop all-hazard risk, resource, and readiness profiles and activity sensitivity information for Sector Corpus Christi

Homeland Security

U.S. Coast Guard Strategic Blueprint

U.S. Department of Homeland Security
United States Coast Guard

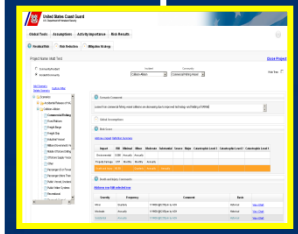
Strategic Blueprint communicated way forward on Risk and readiness mgmt, UPLM, and activity-based costing

CG-8 memo directing risk-based budget build

MSRAM Phase 1 fielded

Risk-based analysis of Rescue 21, RBM, NAIS, and Deepwater investment acquisitions

DHS RAPID Prototype



CCBI Risk Mgmt Module (Phase 1)

Mission	Region			
	AK	NE	SE	WE
Term				
SAR	Low	Low	Medium	Low
CD	Very Low	Very Low	Highest	Highest
LMR	Low	Low	Medium	Low
OLE	Medium	Very Low	Medium	Low
AMIO	Very Low	Very Low	Very Low	Very Low
PWCS	Low	Medium	High	Medium

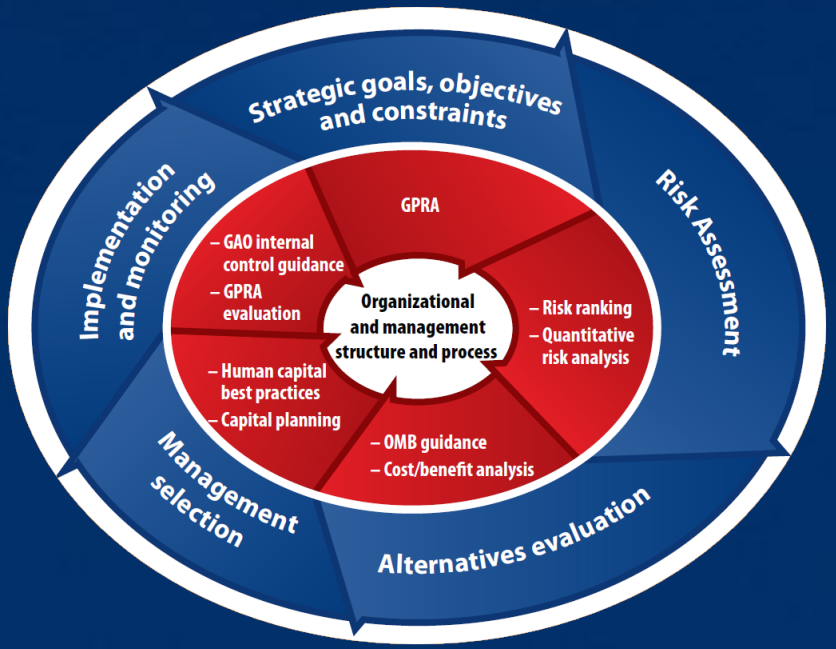
Risk impact analysis in support of fleet mix analysis

What is the National Maritime Strategic Risk Assessment (NMSRA)?

- The NMSRA is a biennial, broad horizontal assessment across the USCG's 6 programs producing:
  - **Residual Risk Profiles:** the risk (expected societal loss) that remains after the USCG has performed all of its activities
  - **USCG Risk Reduction Profiles:** risk reduction impact that USCG response activities have
  - **Key Observations:** risk drivers and risk management opportunities

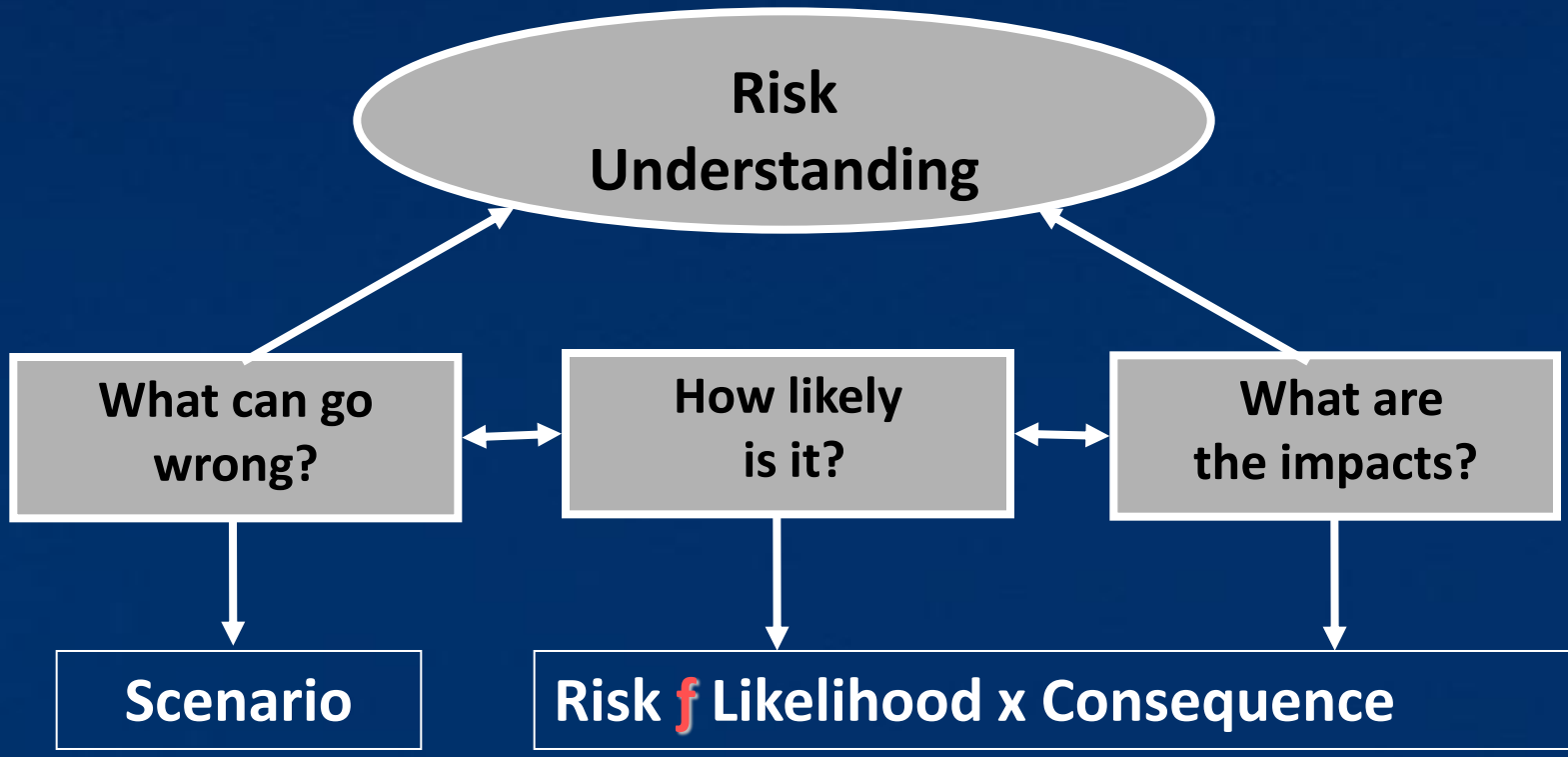
Uses of NMSRA Risk Information

- Program Performance Plans
- Commandant's Budget Intent
- Performance Target Setting
- Mission Analysis Reports
- Standard Operational Planning Process
- Resource Proposal Development and Evaluation



GAO Risk Management Cycle

Basic Elements of Risk



Foundation for Risk Assessment		
• Historical experience	• Analytical methods	• Knowledge and intuition

Methodology

Systematic evaluation of the likelihoods & consequences of scenarios across the nation

Likelihood Categories

Frequency Score Descriptions	Frequency Scores
Continuous	730 events per year
Daily	365 events per year
Weekly	52 events per year
Monthly	12 events per year
Quarterly	4 events per year
Annually	1 event per year
Decade	1 event per 10 years
Half-century	1 event per 50 years
Century	1 event per 100 years
Millennium	1 event per 1,000 years

Consequence Categories

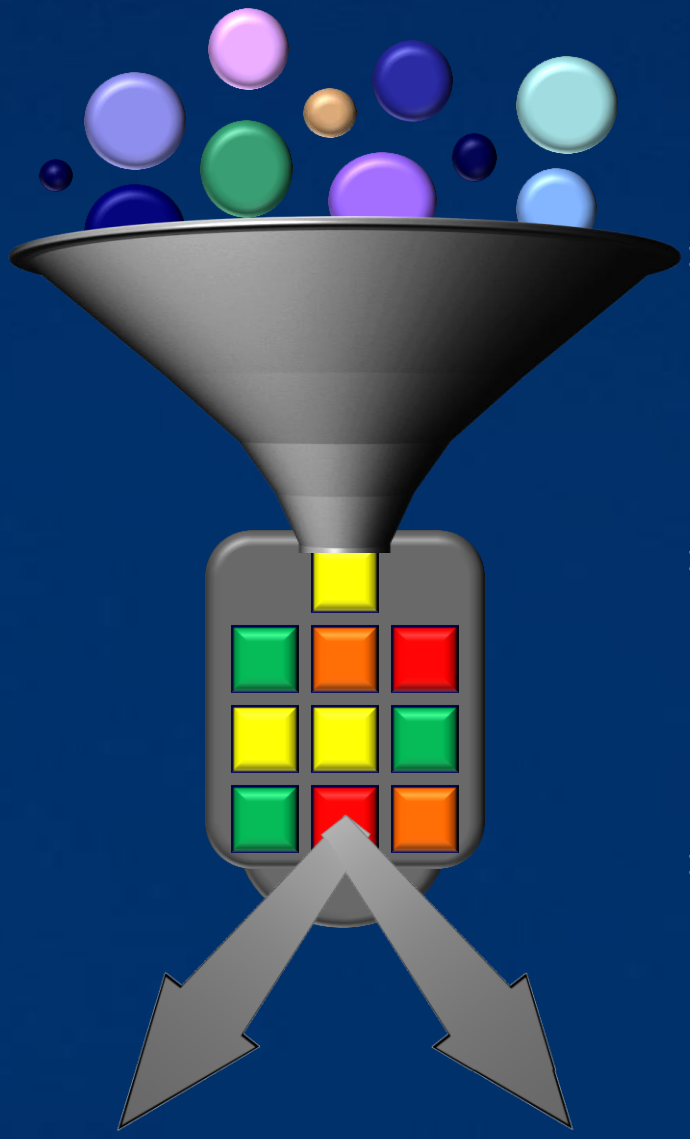
(see handout)

Severity Levels/Pain Points

Impact Types	Category 0	Category 1	Category 2	Category 3	Category 4	Category 5	Category 6
	0	0.155	1.65	16.5	165	1,650	16,500
Death and Injury	No deaths; injuries that are not life-threatening	No deaths;1 life-threatening injury	No deaths (for non-PWCS incidents; >1 life-threatening injury)	1 to 9 deaths and others with life-threatening injuries	10 to 99 deaths and others with life-threatening injuries	100 to 999 deaths and others with life-threatening injuries	1,000 to 9,999 deaths and others with life-threatening injuries
Direct Economic Loss (Including Property Damage)	<$10,000 in damage/loss	$10,000 to $299,999 in damage/loss	$300,000 to $2.9 million in damage/loss	$3 million to $29 million in damage/loss	$30 million to $299 million in damage/loss	$300 million to $3 billion in damage/loss	$3 billion to $29 billion in damage/loss
Secondary Economic Loss	No impact on local economy		Minimal impact on local economy	Minor impact on local economy	Minor impact on regional economy Moderate impact on local economy	Moderate impact on regional economy Major impact on local economy	Minor impact on national economy Major impact on regional economy
Maritime Mobility, Recovery and Commerce		Interruption of vessel traffic/port commerce or recovery operations for several hours Inability of stranded asset (tug/crane) to participate in salvage operation for one week	Interruption of vessel traffic/port commerce or recovery operations for up to a day Inability of stranded major asset (crane barge) to participate in salvage operation for one month	Interruption of vessel traffic/port commerce or recovery operations for a week Inability of stranded major asset (crane barge) to participate in salvage operation for several months Medium to long-term effect on local public safety, e.g., damaged flood control measures. Long term disruption to transportation systems that move people, e.g., ferries, roads, and bridges	Interruption of vessel traffic/port commerce or recovery operations for several weeks Short-term disruption in public safety regionally, e.g., extensive damage to flood control measures. Broad long-term disruption to transportation systems that move people, e.g., ferries, roads, and bridges	Interruption of vessel traffic/port commerce or recovery operations for a month	Interruption of vessel traffic/port commerce or recovery operations for several months
Environmental		A fishery subject to CG enforcement receives an annual average NMFS sustainability rating between 3 and 3.9	A fishery subject to CG enforcement receives an annual average NMFS sustainability rating between 2 and 2.9.	A fishery subject to CG enforcement receives an annual average NMFS sustainability rating between 1 and 1.9. Or, a fishery scores 0 because of an unknown status.	A fishery subject to CG enforcement receives an annual average NMFS sustainability rating of less than 1, but not 0.		
		Environmental nuisance	Cumulative effect of multiple impacts that could cause a living marine species to become locally endangered (Other than a managed fishery.)	Living marine species becomes locally endangered. (Other than a managed fishery.)	Short-term collapse of at least one living marine species over a large area (Other than a managed fishery.)	Long-term collapse of at least one living marine species over a large area. (Other than a managed fishery.)	

- Deaths/Injuries
- Direct Economic
- Secondary Economic
- Maritime Mobility
- Environmental
- Law Enforcement
- National Security
- Civil Order

Analysis Process



INPUTS

- **Data**
- **Models/Studies**
- **SMEs**

RISK ASSESSMENT FRAMEWORK

- **Methodology**
- **Scoring Criteria**
- Elicitation Process

OUTPUTS

- **Risk Profiles**
- **Risk Drivers**
- **Findings**

INFORMED DECISIONS

- **Strategic Plans**
- **Budgeting**
- **SOPP**

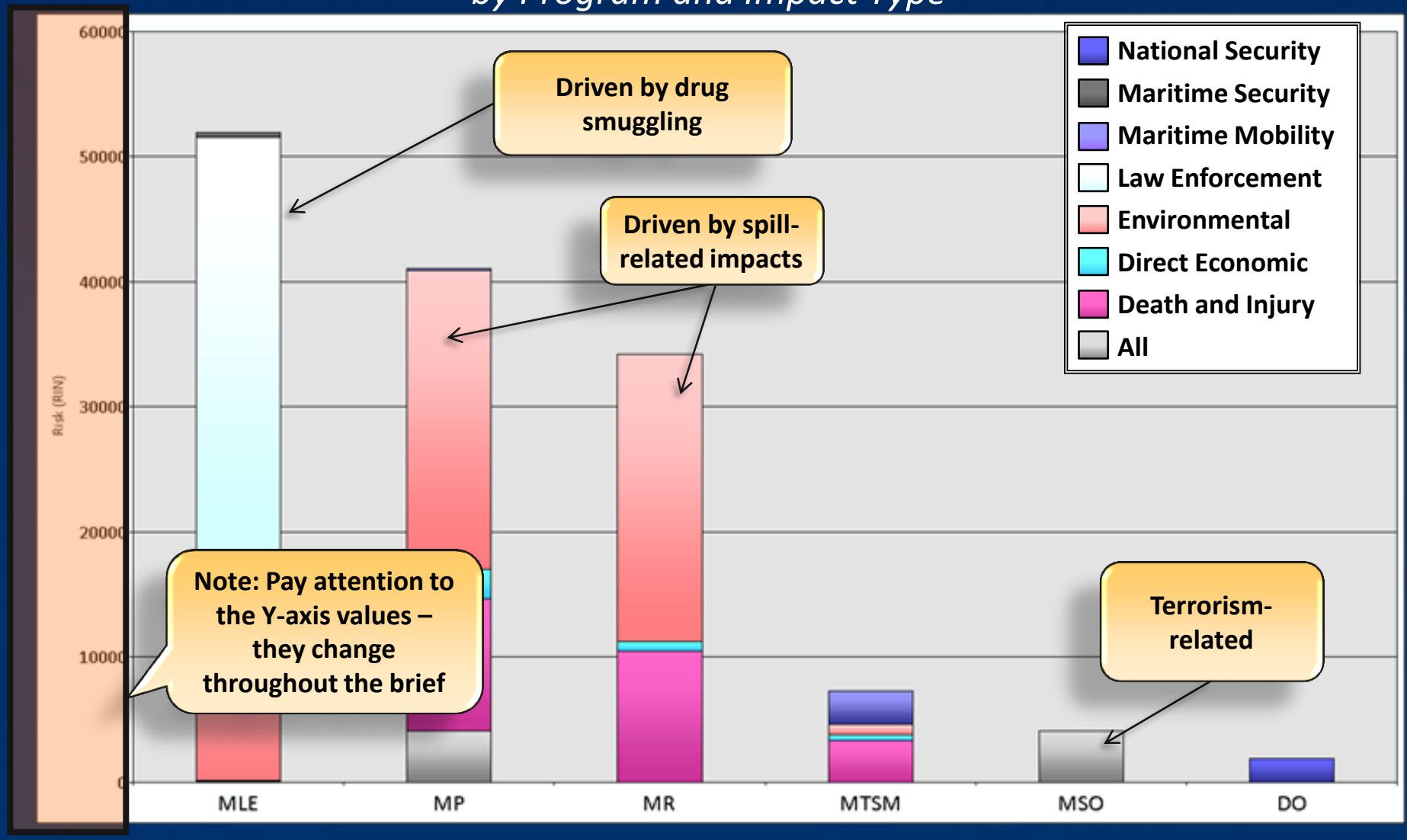
Results Interpretation

- **Risk** is expected societal loss over time
  - The unit of measure for all graphs is Risk Index Number (RIN):
    - 1 RIN = $1M annual expected loss
- **Residual Risk**: societal loss expected to occur despite interventions including the Coast Guard
- **Response Risk Reduction**: societal loss mitigated through CG action that we can currently estimate
  - Note: at this time, we did not estimate the risk reduction due to our prevention activities
- **Not Resource Profiles! Context is required.**

Summary Risk Results

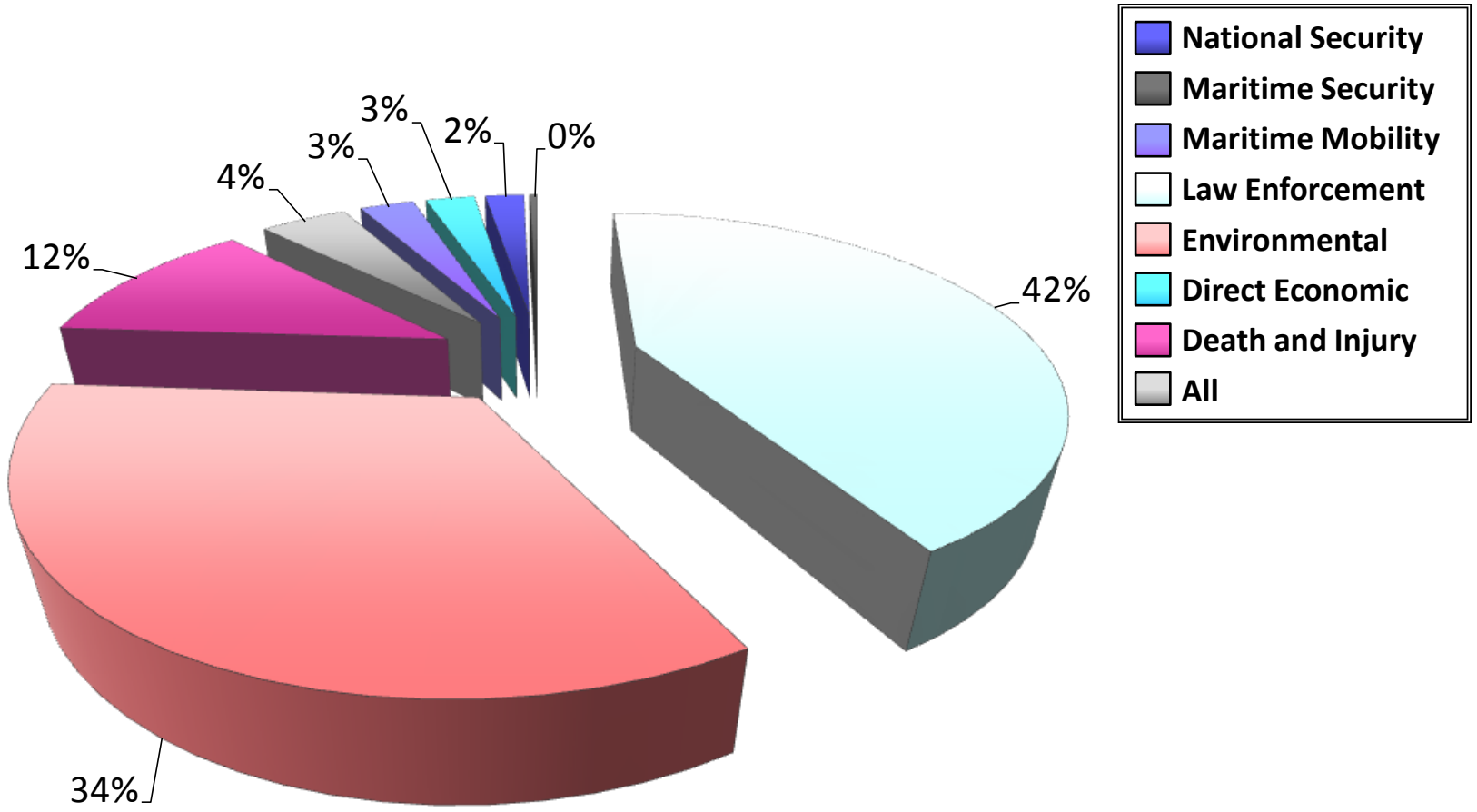
Residual Risk

by Program and Impact Type



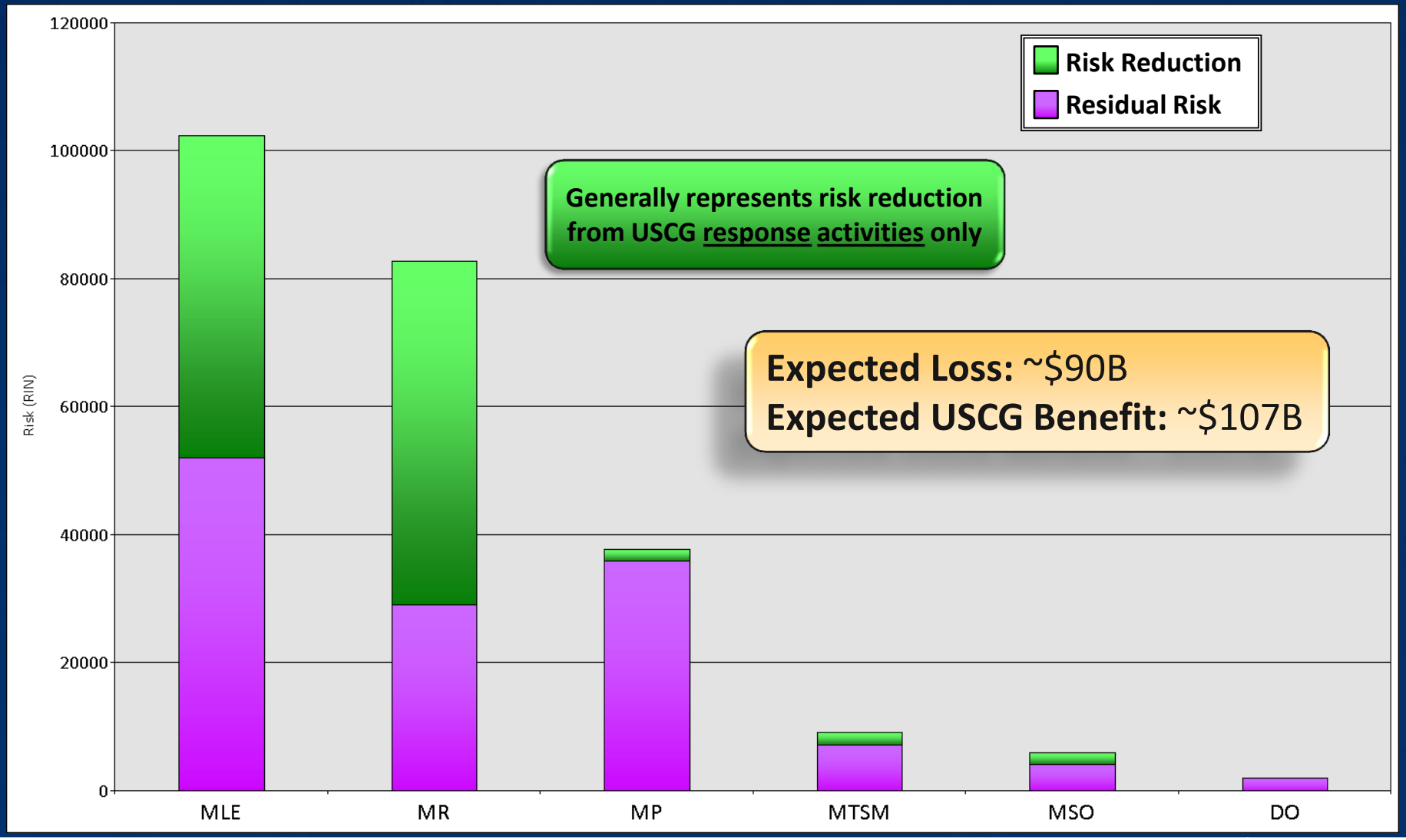
Residual Risk

by Impact



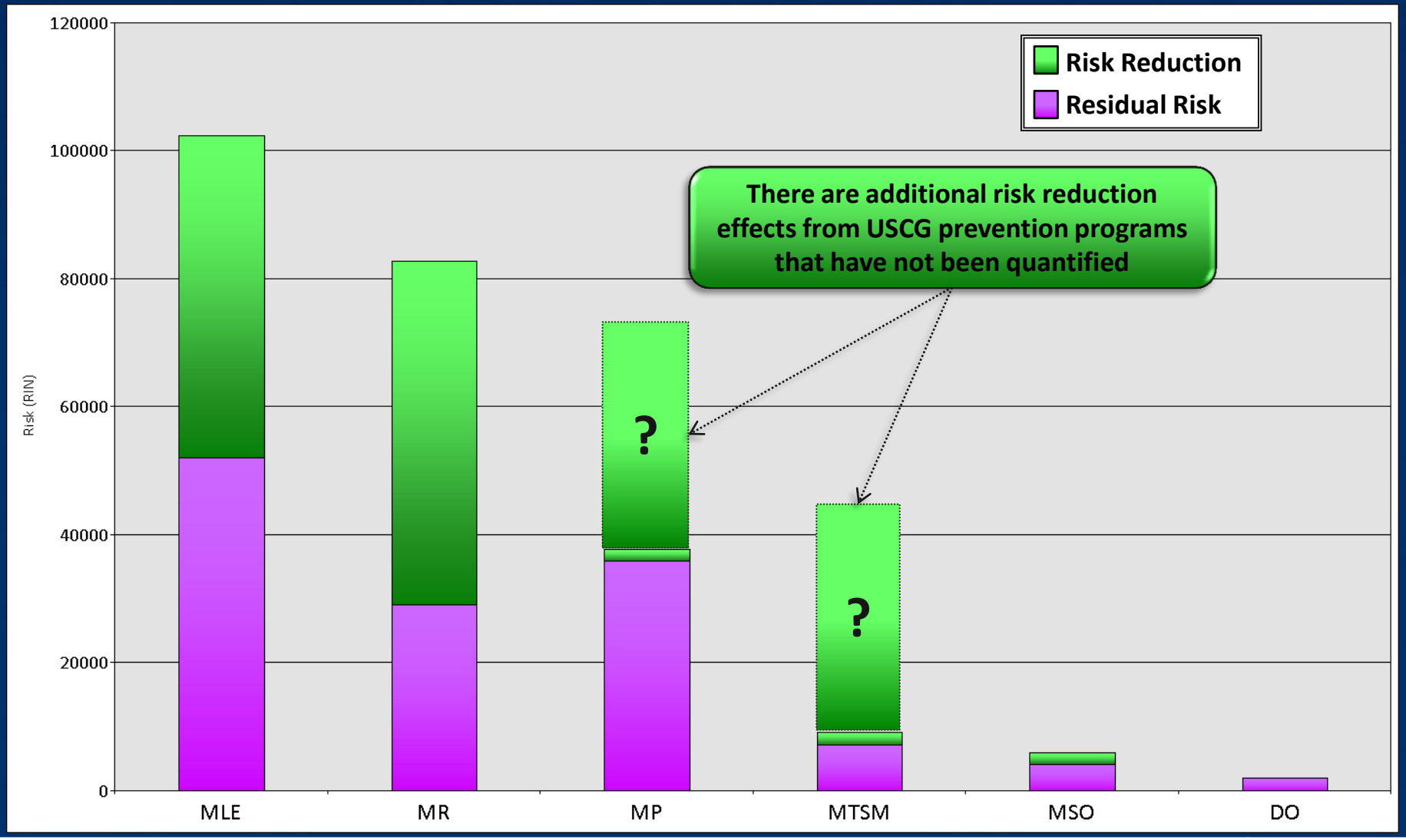
Residual Risk and Risk Reduction

by Program



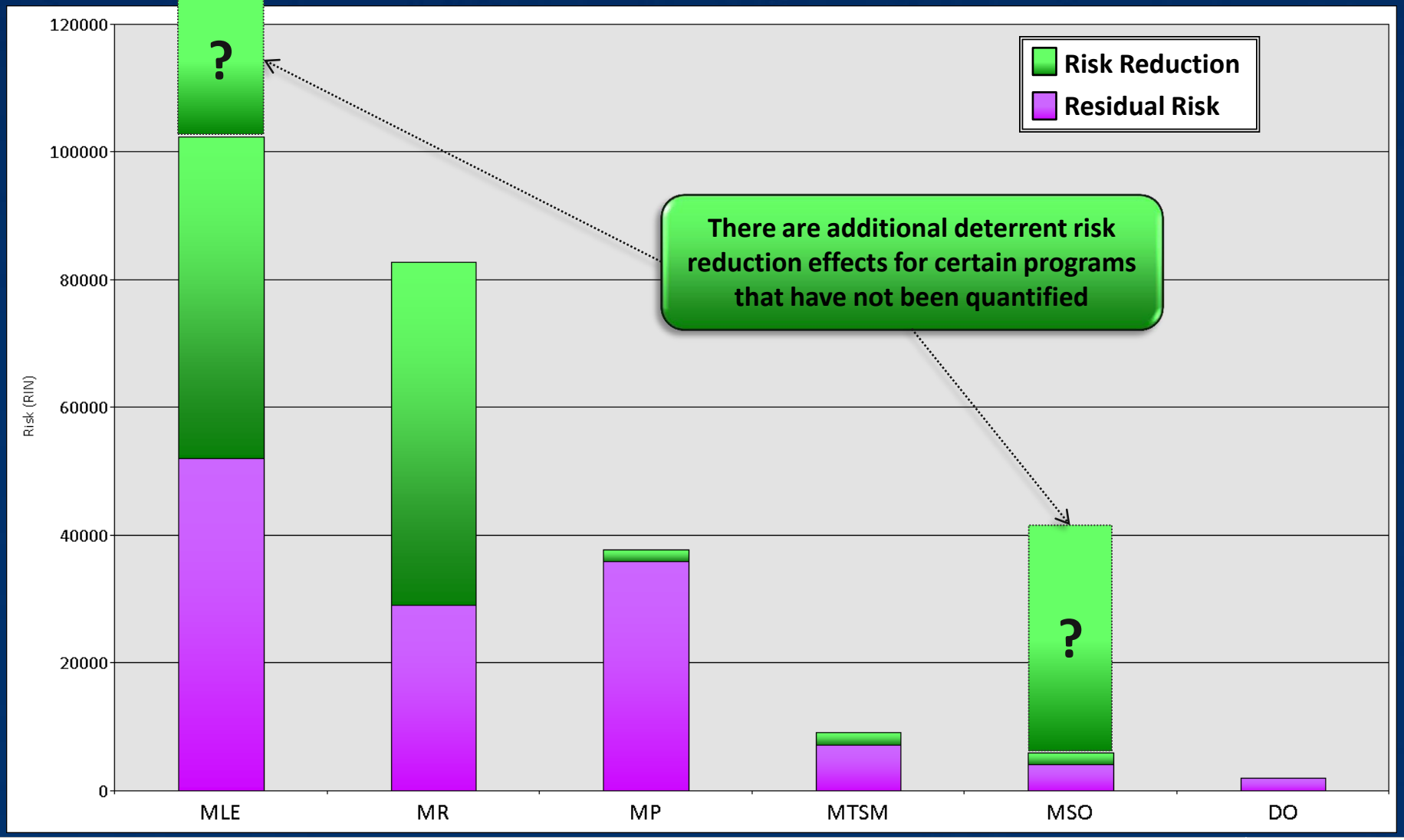
Residual Risk and Risk Reduction

by Program



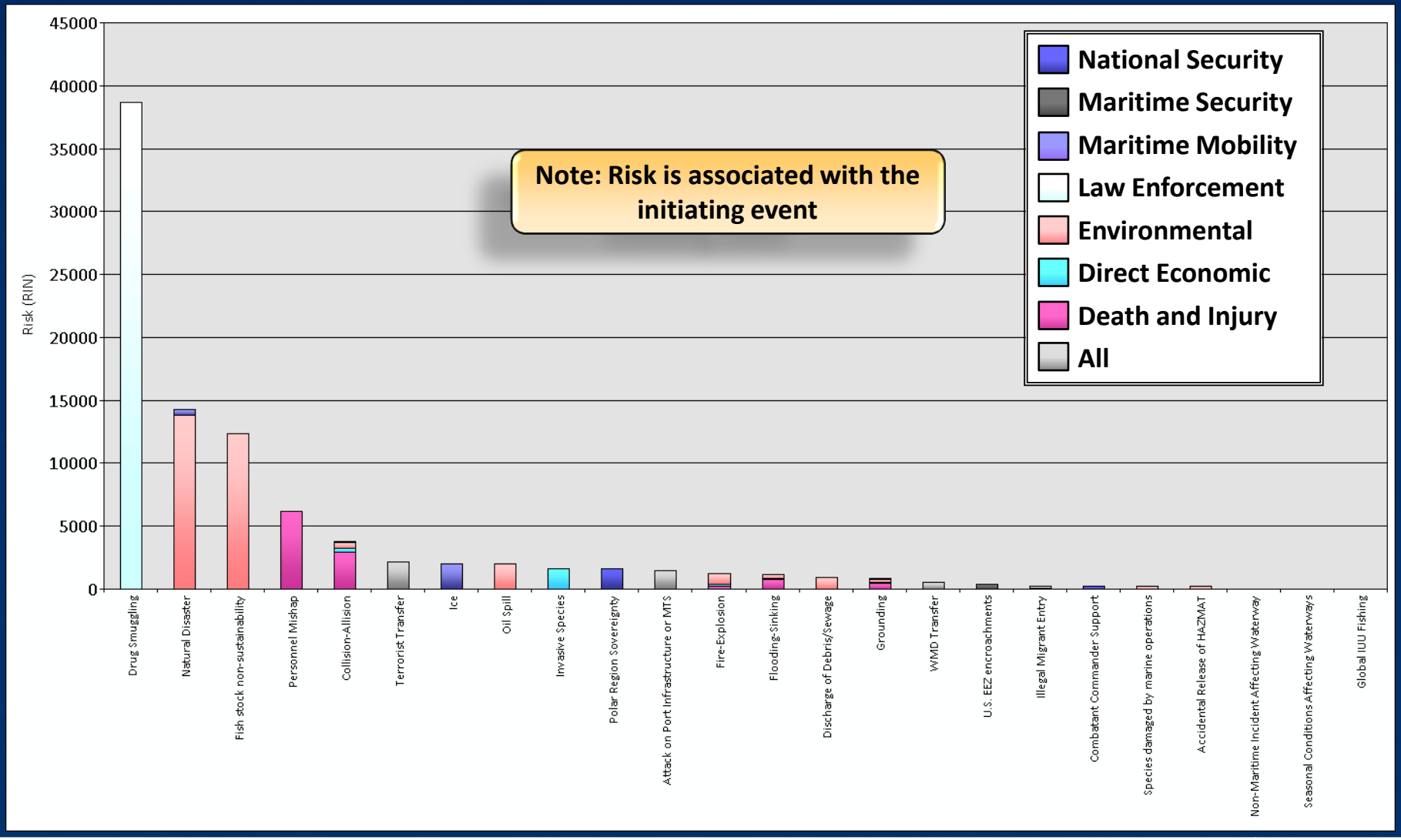
Residual Risk and Risk Reduction

by Program



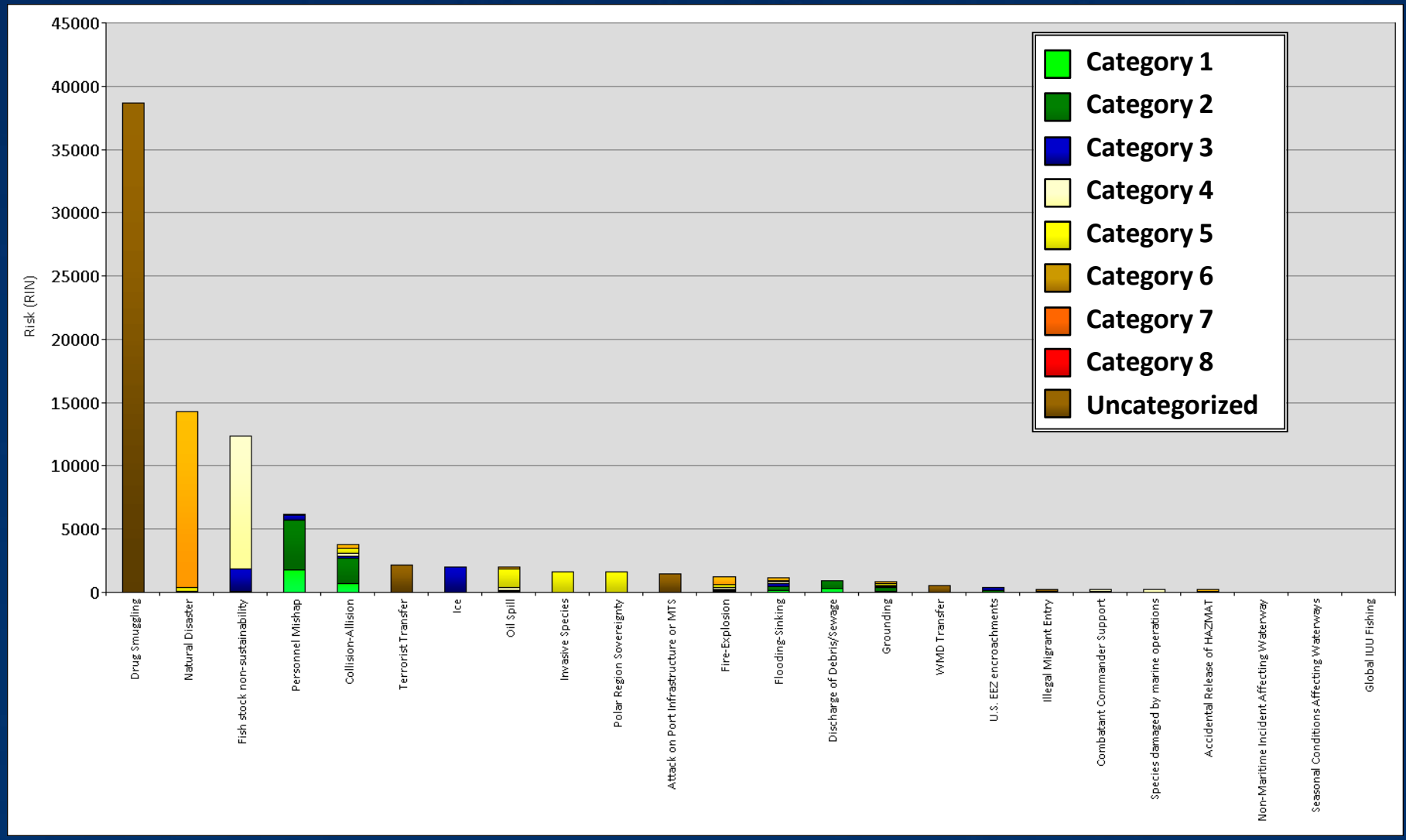
Residual Risk

by Incident and Impact



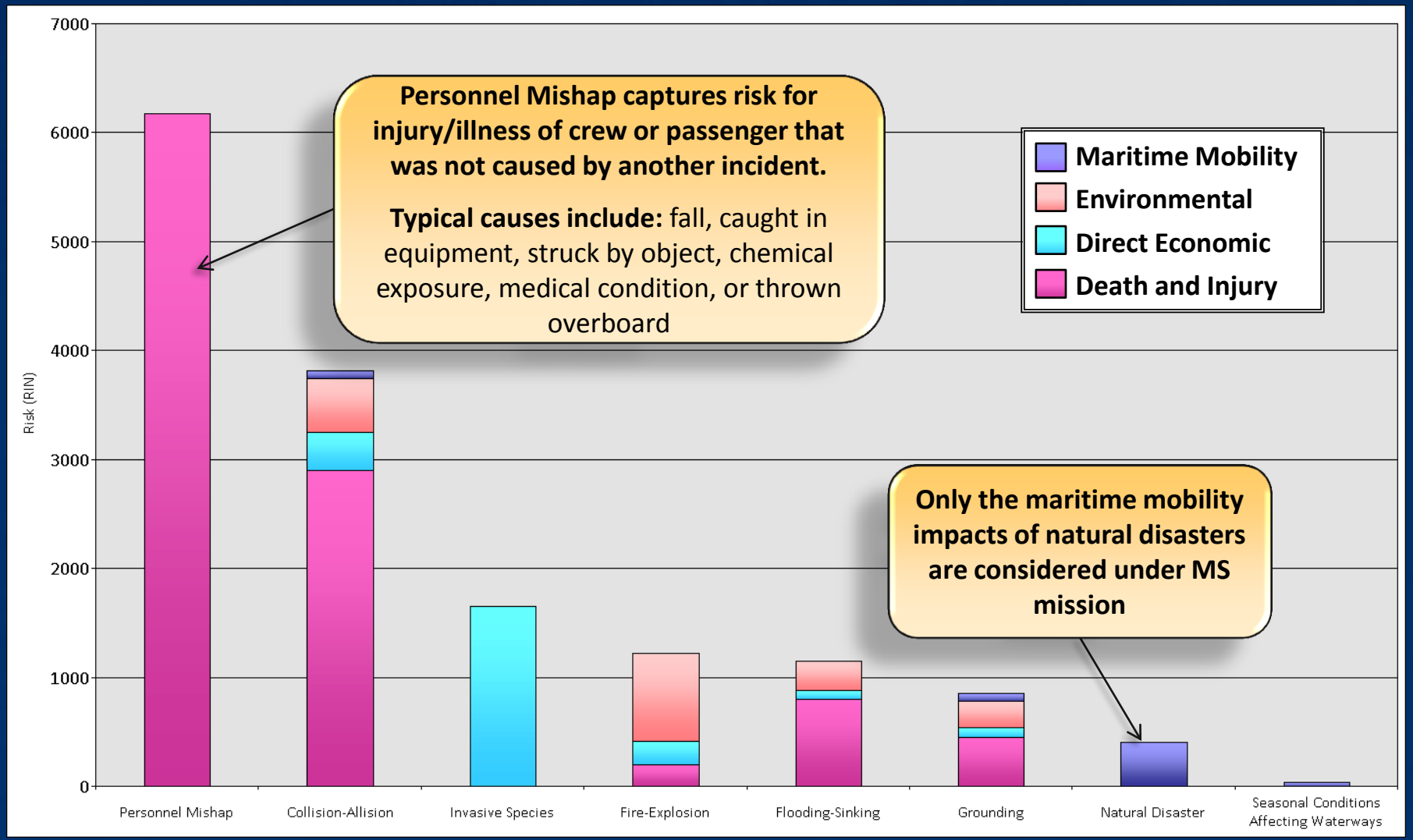
Residual Risk

by Incident and Severity



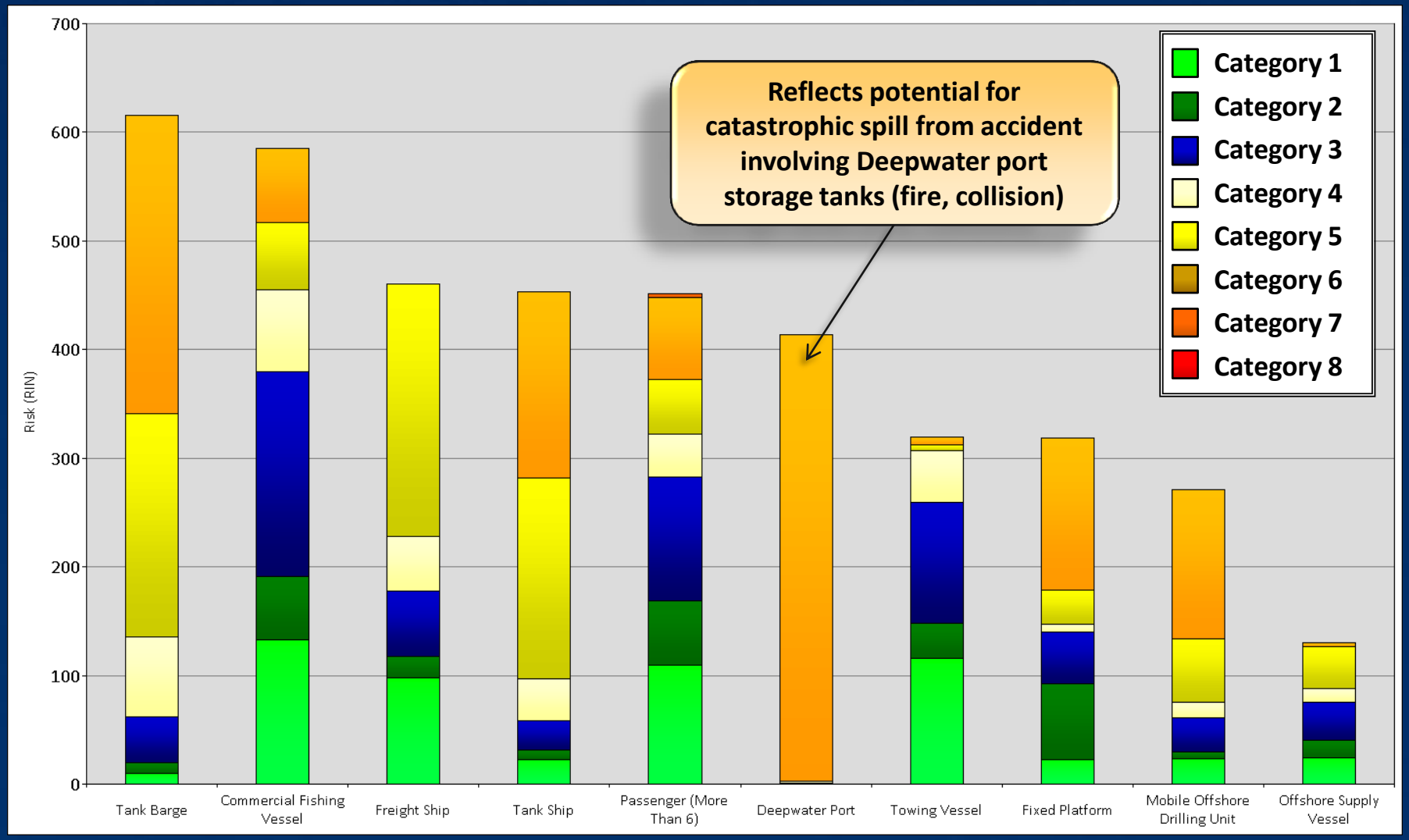
MS Residual Risk

by Incident and Impact



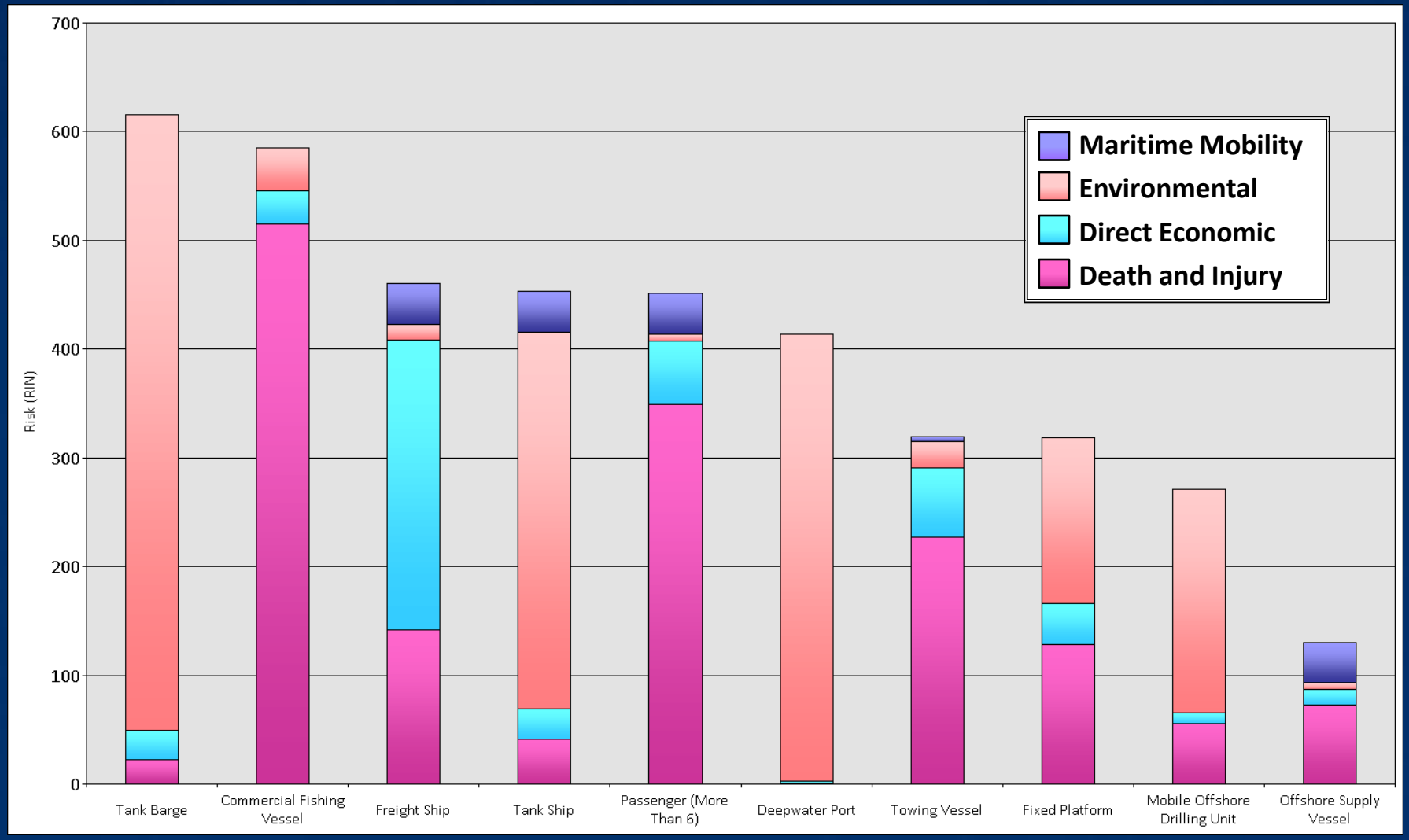
MS Residual Risk:

Top 10 Commercial Communities by Severity



MS Residual Risk:

Top 10 Commercial Communities by Impact



Prevention Risk Reduction Prototype: Fishing Vessel Safety Examinations

- Goal: Estimate risk reduction of *Prevention* activities on an annual expected benefit basis
  - Generating results that are comparable to other NMSRA results (residual risk and *Response* risk reduction)

Fundamental Analysis Question

Given an accident where crew members are at "At-Risk": How much less likely are they to die if they are on a vessel that passed the safety exam?

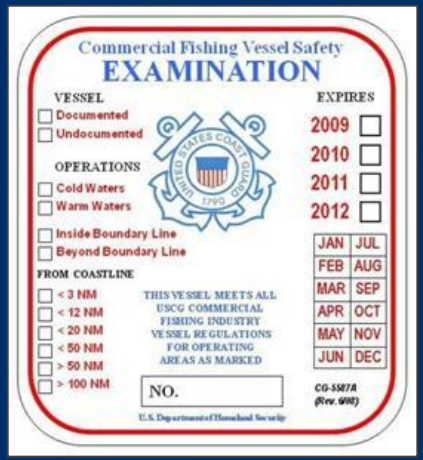
t

Prototype Results

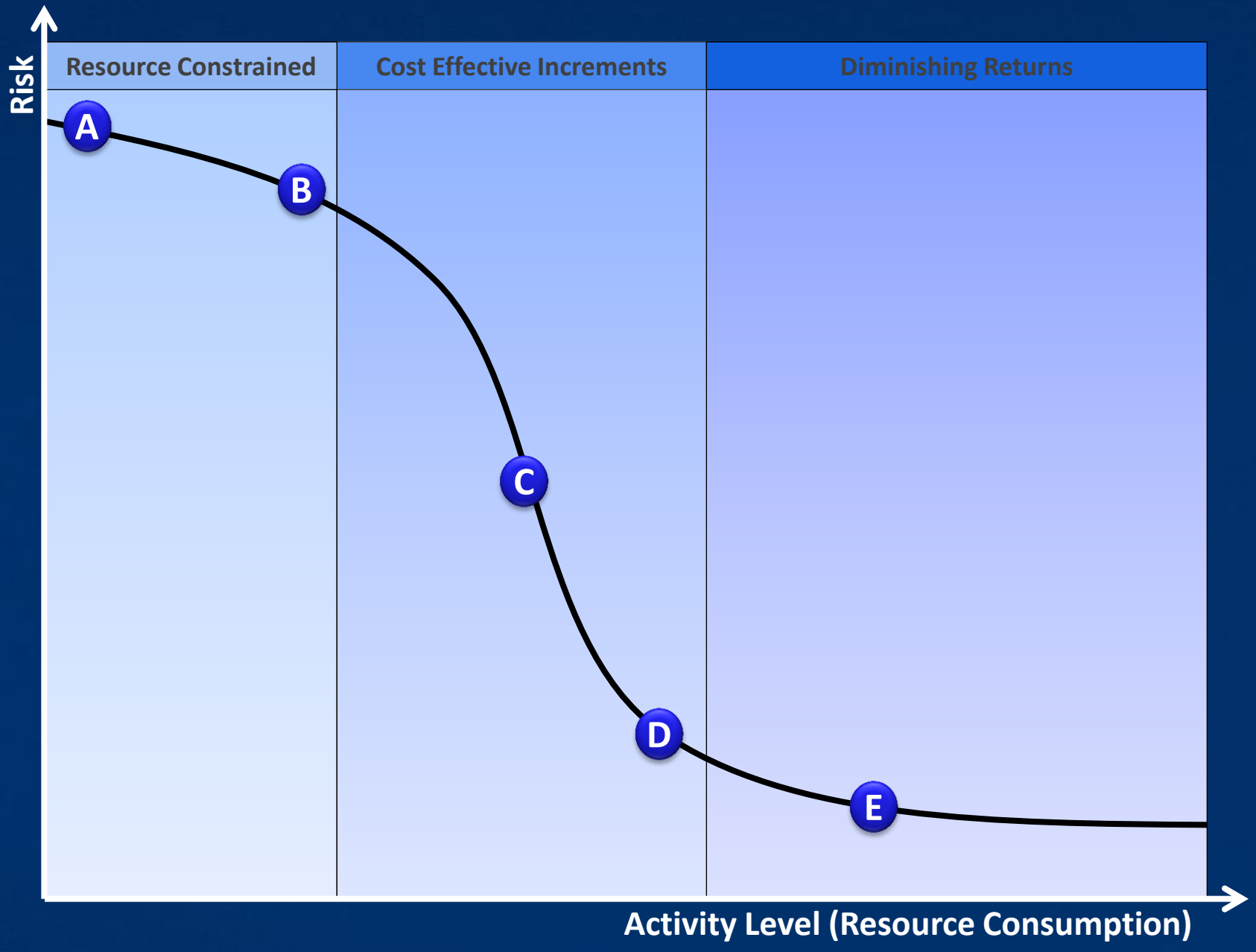
- Crews of vessels passing safety examination are 34% more likely to survive an accident
- Program estimated to save 21 lives from 2003 to 2010, or an average of:

2.6 lives per year or 16.5 RIN

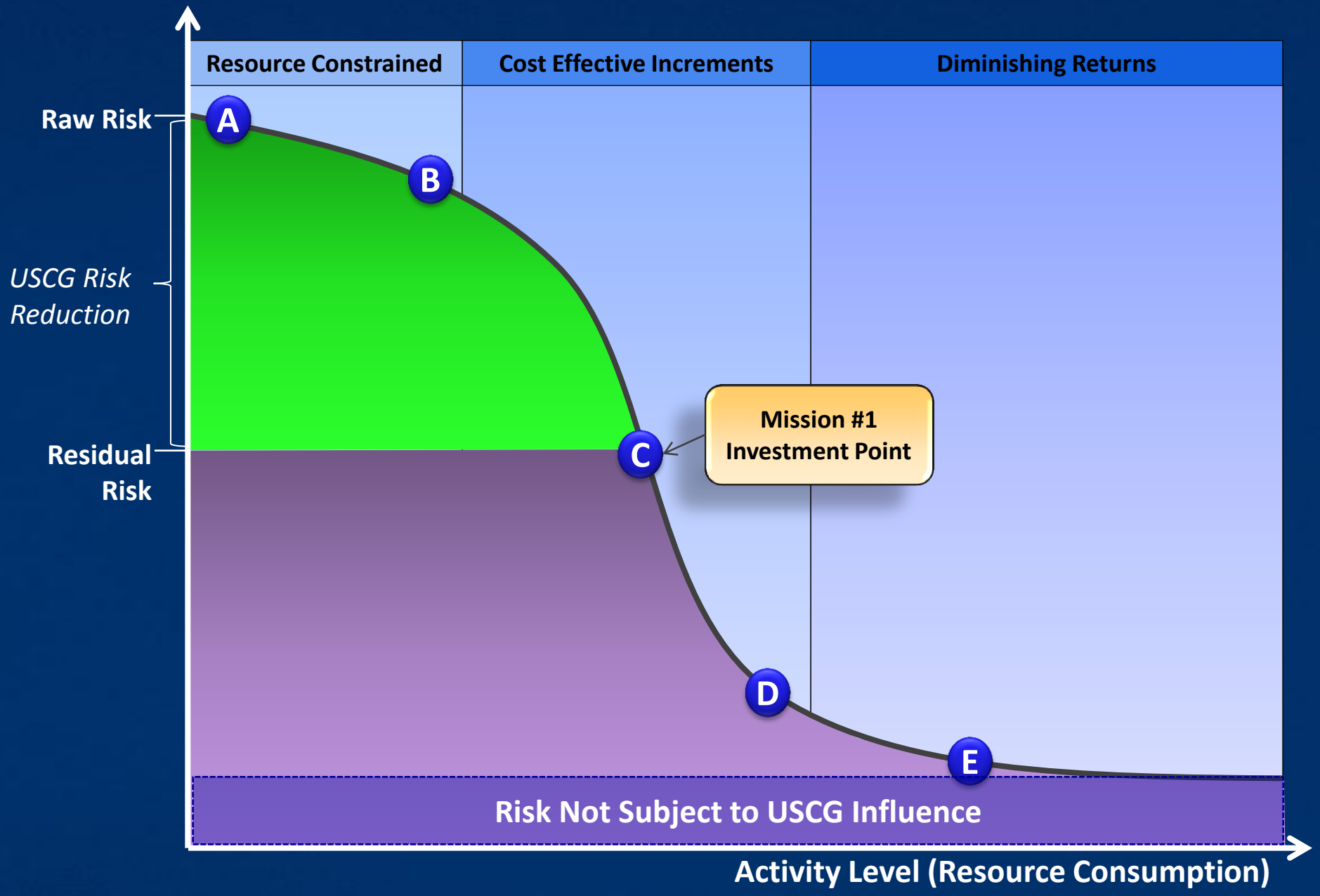
11:1 to 21:1 ROI based on Program Cost



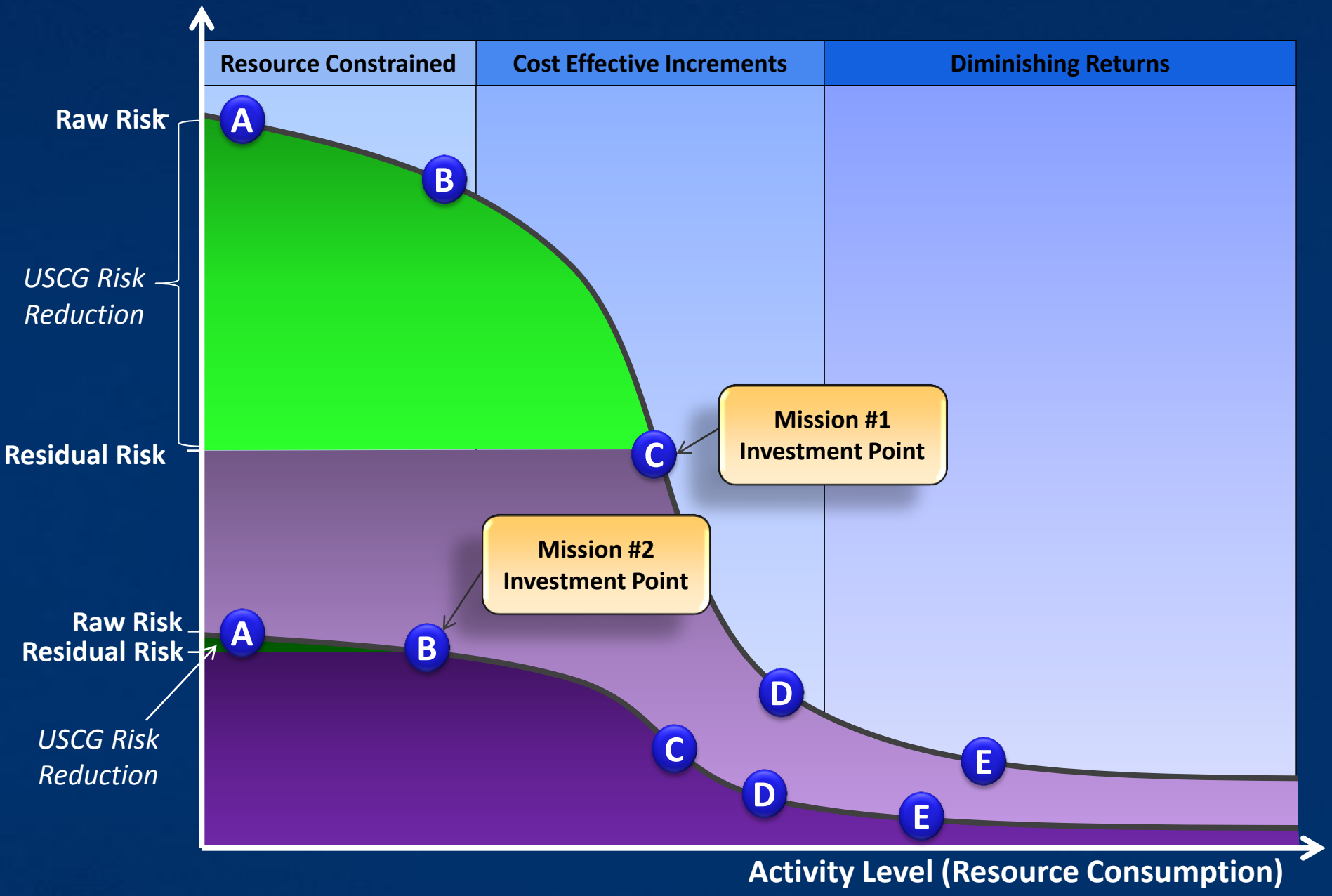
Risk-to-Resource Curves



Mission Example



Mission Comparison Example



Risk-Based Application

- Good investment candidates
  - High risk missions at points A, B or C
  - Medium risk missions at B or C
  - Very low cost missions at A, B, or C
- Good reinvestment candidates
  - Any mission at point E
  - Low risk missions at C or D
  - Very low risk missions at any point

Questions