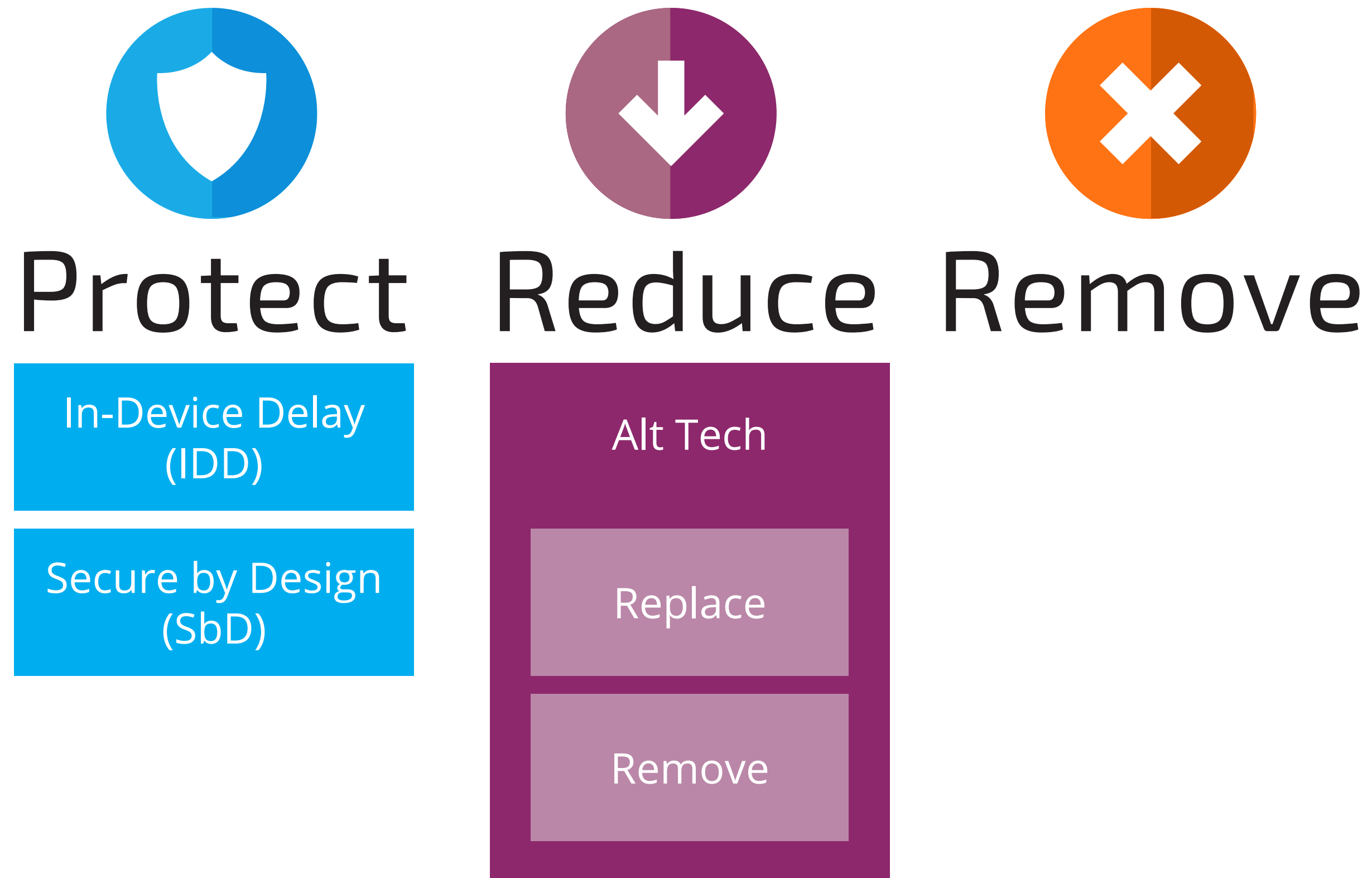


Cesium Chloride: Risks and Alternatives

Mark E. Ekman | Mark Ladd | Alexander Solodov
 Sandia National Laboratories, PO Box 5800, Albuquerque, NM 87185, USA

Alternatives—Office of Radiological Security—Global Cesium Security Initiative (GCSI)



GCSI prioritizes radiological security enhancements for cesium-137 devices and buildings worldwide under three ORS strategies – **Protect, Reduce, and Remove**

Protect

- Implement security at Cs-137 sites
- Support In-Device Delay (IDD) upgrades and Security-by-Design to improve physical protection on to greatly increases times for an adversary to access the radioactive source without affecting routine device operation, warranty, and safety

Reduce

- Permanently reduce the risk of radiological terrorism with alternative technology.
- Provide assistance to replace Cs-137 devices with viable alternative technologies with support for removal or consolidation of disused Cs-137 devices.

Remove

- Provide assistance with consolidation of disused sources at a secure national storage facility

ORS also works with response entities to facilitate the development of response protocols, plans, and procedures so that a timely, coordinated, and effective response is implemented

What is Risk?

Risks exist whenever there is a possibility of an event occurring in which assets, people, or institutions may be subject to some form of damage or other negative outcome.



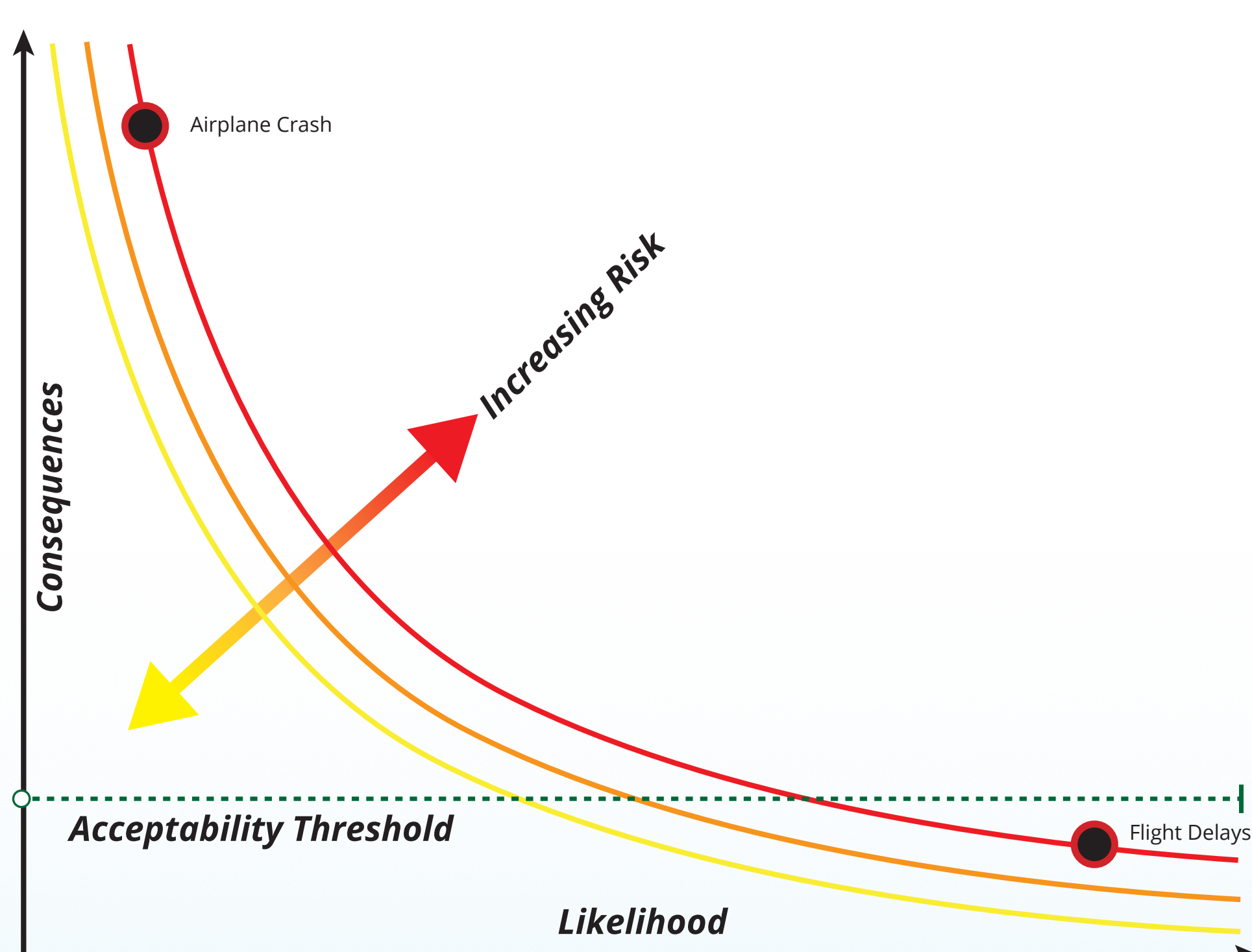
We deal with risk every day; we identify risks, evaluate them, and make decisions with risks in mind (consciously or otherwise). Sometimes we take actions to mitigate risks as we understand them, but such actions do not eliminate the risks themselves.

Security Risks Explained

In a security setting, risk levels are determined by examining the **likelihood** of a consequence occurring and the **consequence's severity**.

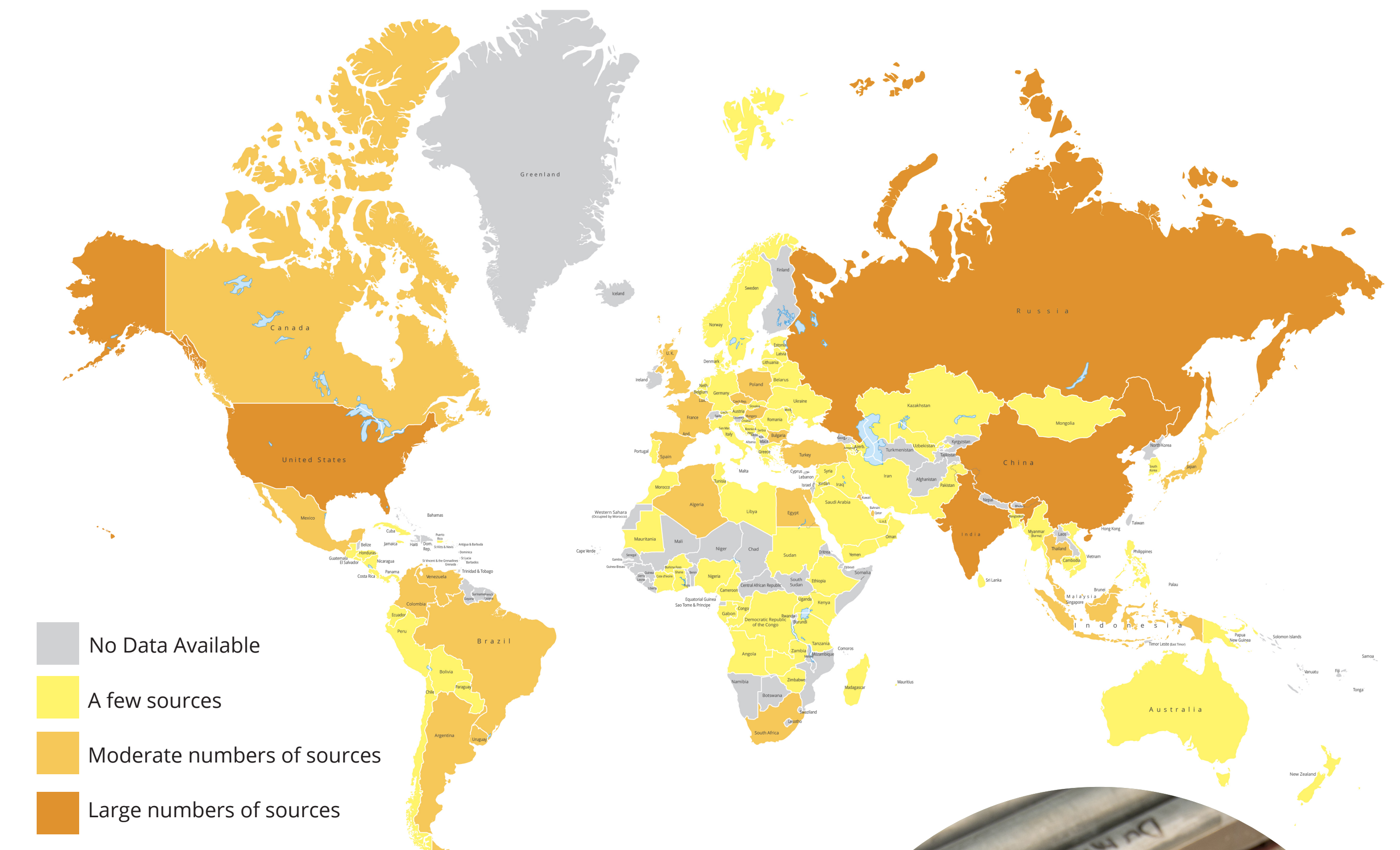
Acceptable risk is that level of risk the State does not work to further reduce through the expenditure of security resources. But the State needs to define the acceptable risk threshold above which security resources will be applied.

Consequences drive the threshold. Risk remains constant along a curve.



Cs-137 poses risks above the acceptable threshold

Sources that utilize Cs-137 are ubiquitous and employed in such medical and industrial applications as cancer therapy, sterilization, blood irradiation, research, and food safety.



Cs-137 has been central to a number of notable accidents and incidents

- Finland, 2016
- Norway, 2015
- Fukushima, Japan March 2011
- China, 2009
- Spain, 1998
- Georgia, 1997
- Ukraine, 1989
- Goiania, Brazil Sept. 1987
- Chernobyl, USSR April 1986



Understanding radiological risks

