Managing Risk

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Real Life Examples

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Employment

Home Life

Risk Varies

Recreation

Rocky Flats Plant

Johnston Atoll

Fukushima

Chornobyl

For my job

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Grants New Mexico

https://www.weather.gov/jetstream/cascadia_max

For my recreation


For my community

Managing risk is part of the process of cleanup

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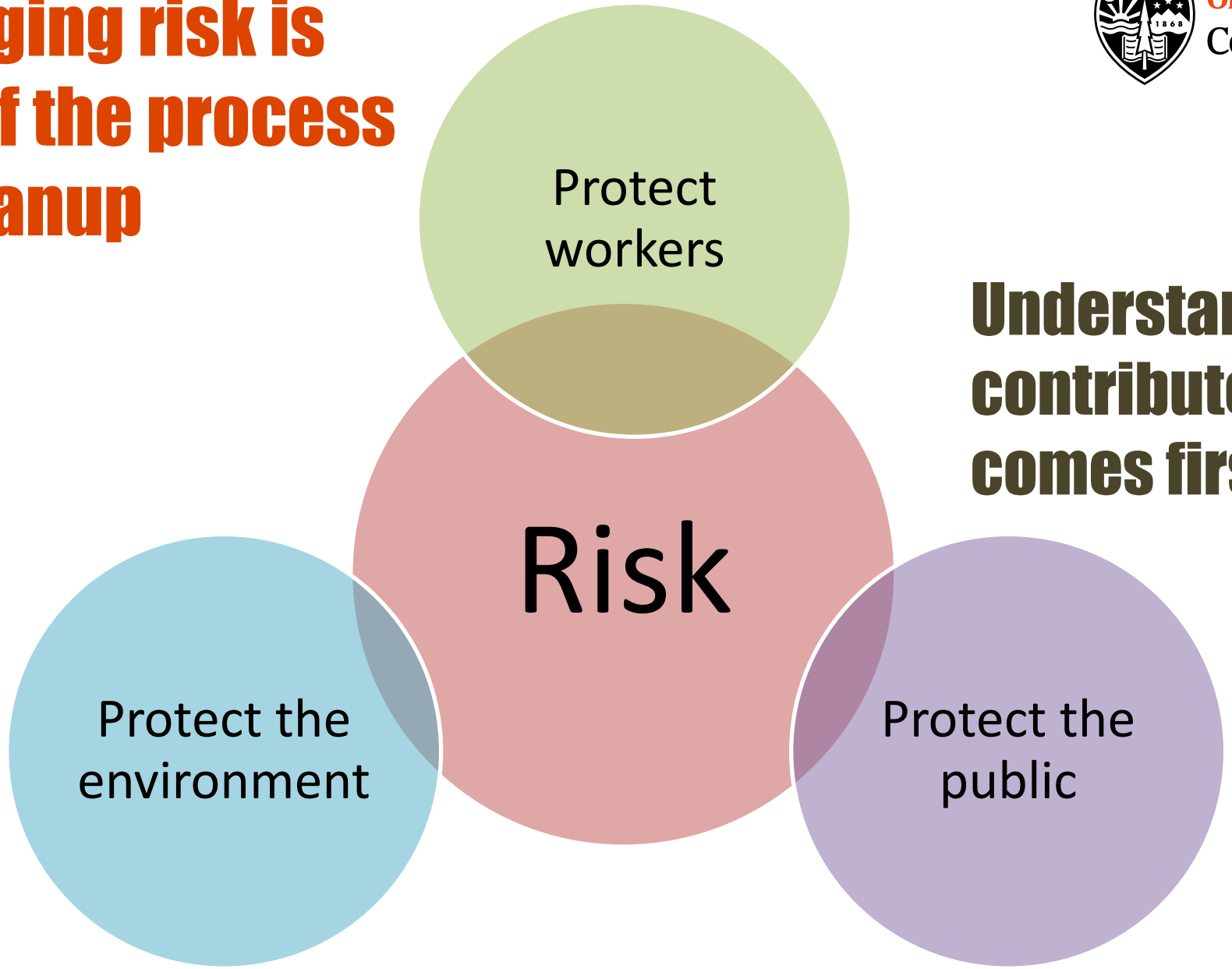

Understanding what contributes to risk comes first

Three contributors to risk

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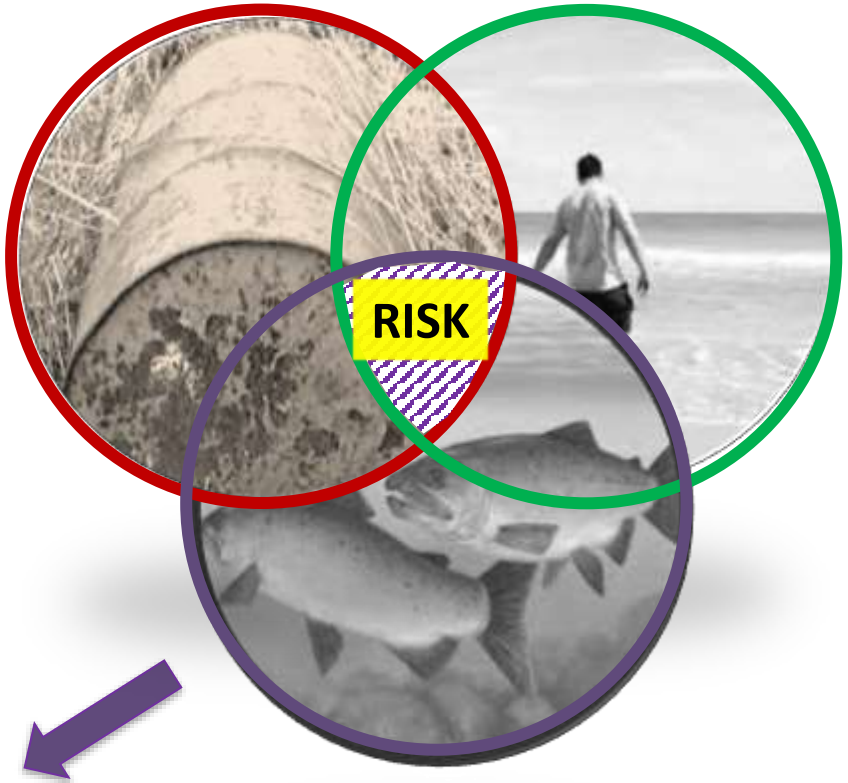
SOURCE:
something
hazardous, toxic,
carcinogenic, …



RECEPTOR:
someone or something
that can be impacted

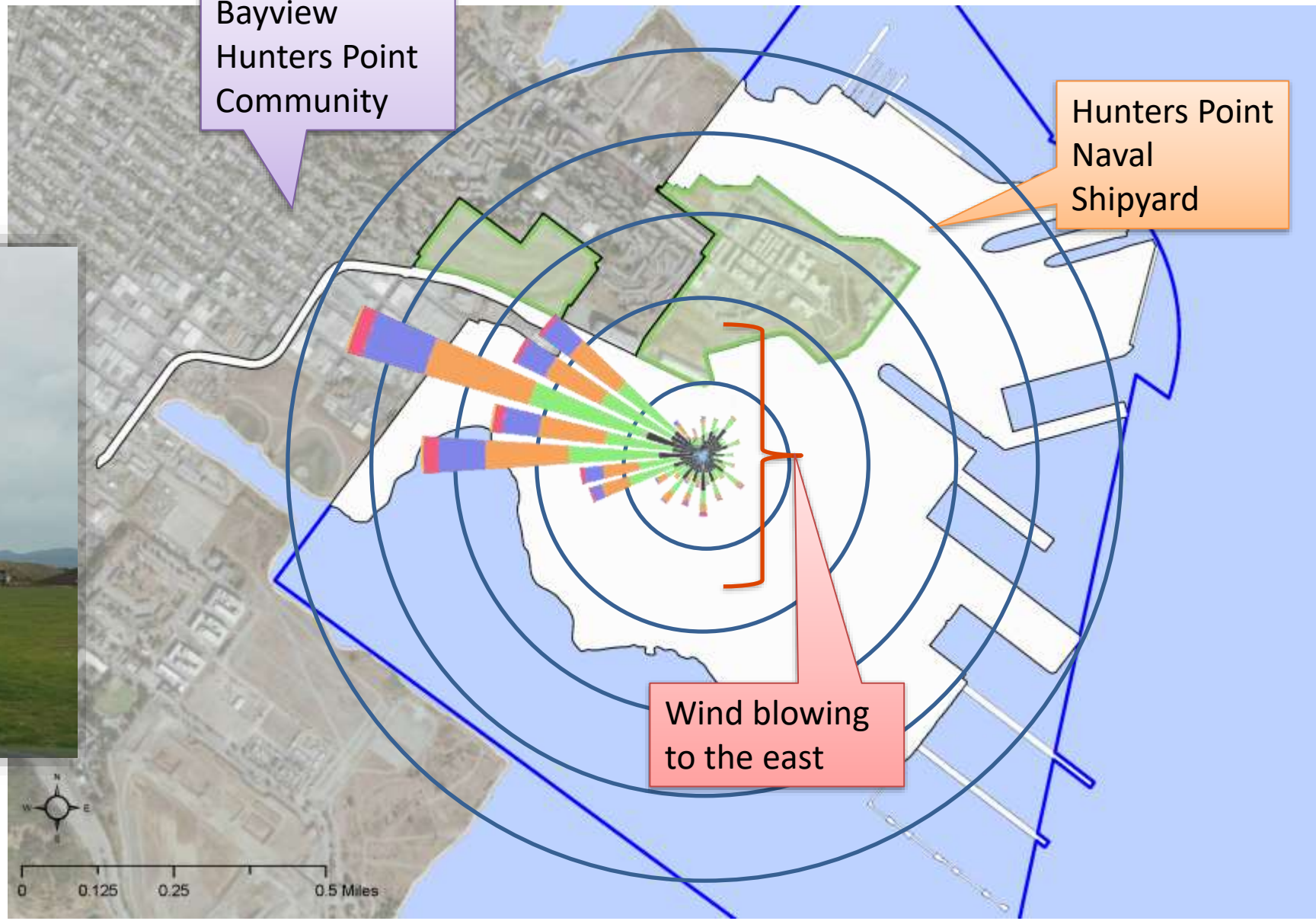
PATHWAY:
the route taken to get the
source to the receptor – through
air, water, soil, food, skin….

All three - **source, receptor, <u>and</u> pathway** - must be present, together, for risk, or consequence to occur.

Blocking or removing any removes the risk.

Example: Managing risk from airborne emissions

Blocking pathways of exposure



Wind Rose Diagram, 1948 - 2018

ref: HPNS Parcel E-2 Final Remedial Action Work Plan; Phase III; December 2018

Managing risk from low levels of radioactivity

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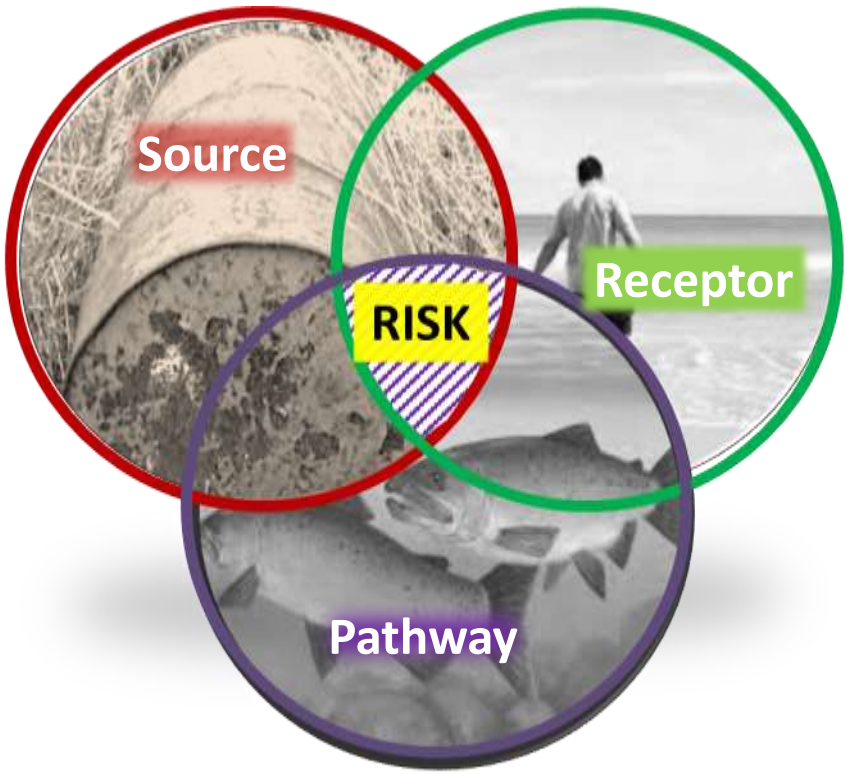

Risk can be managed by:

- Removing or reducing the ***source*** of radioactivity to low levels
  - e.g., by digging contaminated soil
- Blocking, removing, or ***reducing*** pathways of transport
  - e.g., covering with clean soil
- Limiting how people interact with the site
  - e.g., having building codes

Managing risk from low levels of radioactivity

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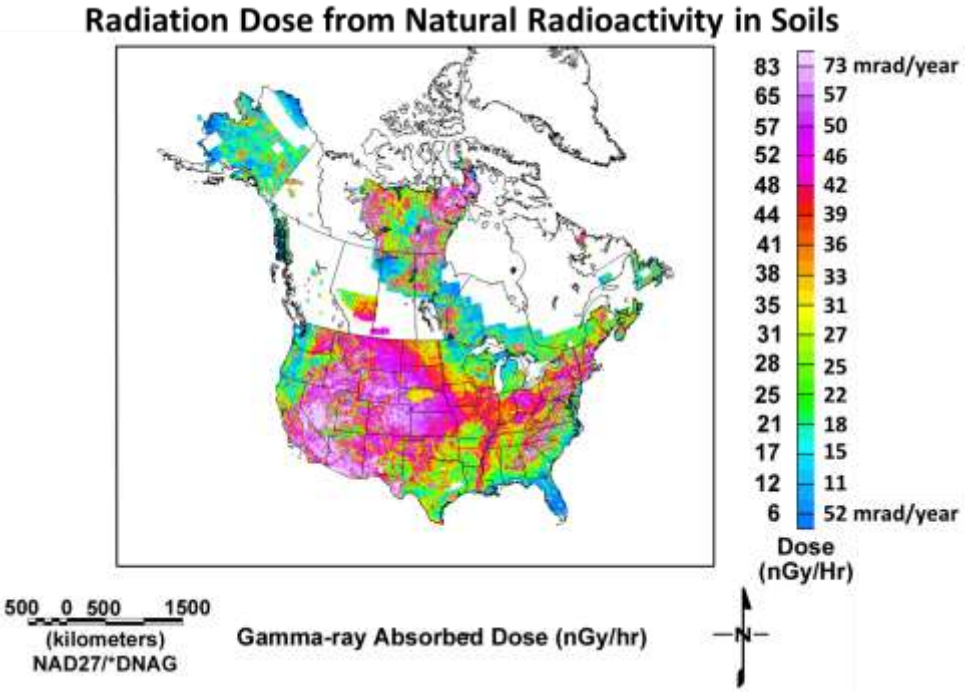
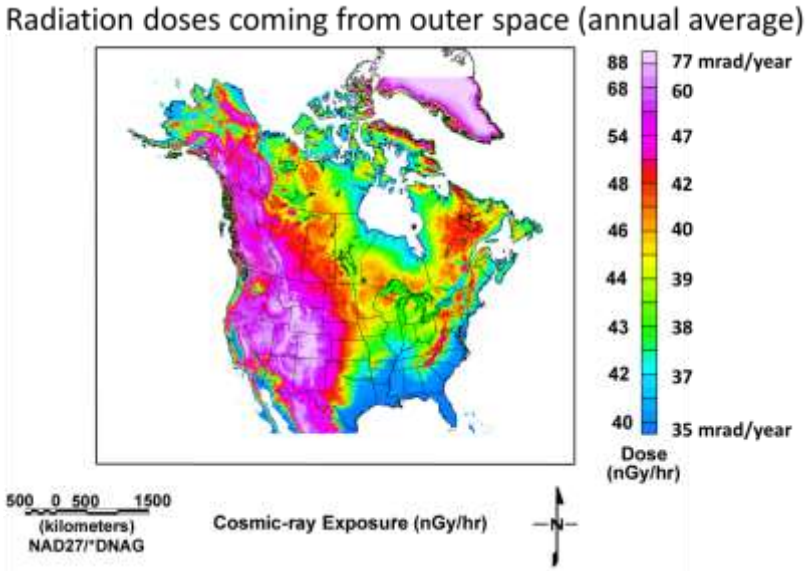
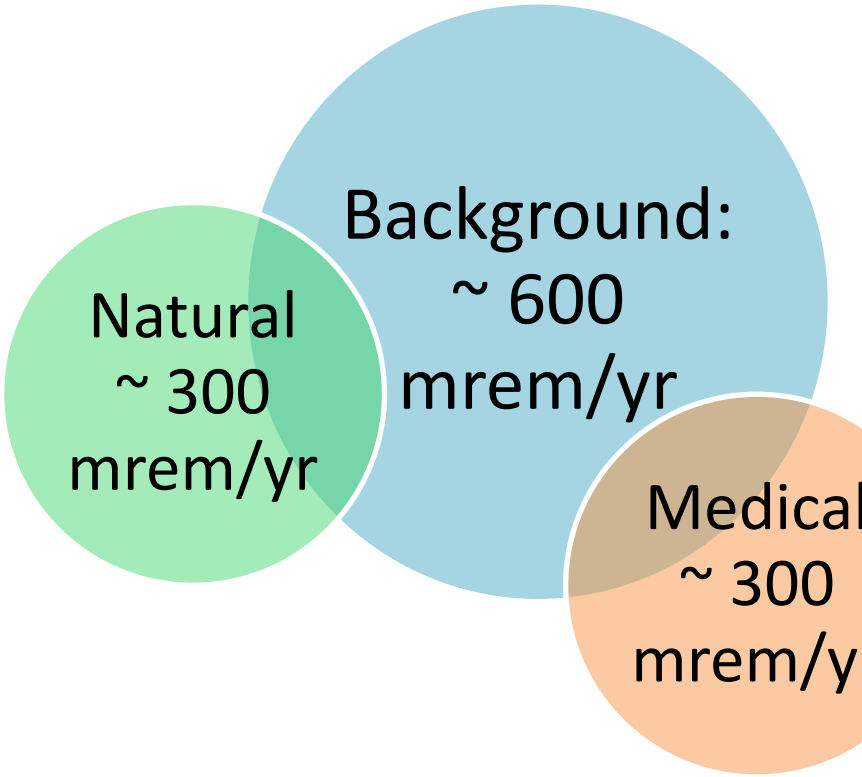
- Low levels of radioactivity → low concentrations
- Low levels of radioactivity → low risk
- Finding radioactivity at really low levels requires mindful collection and analysis
- Sample analysis can be challenging
  - natural radioactivity is always present as a complicating factor

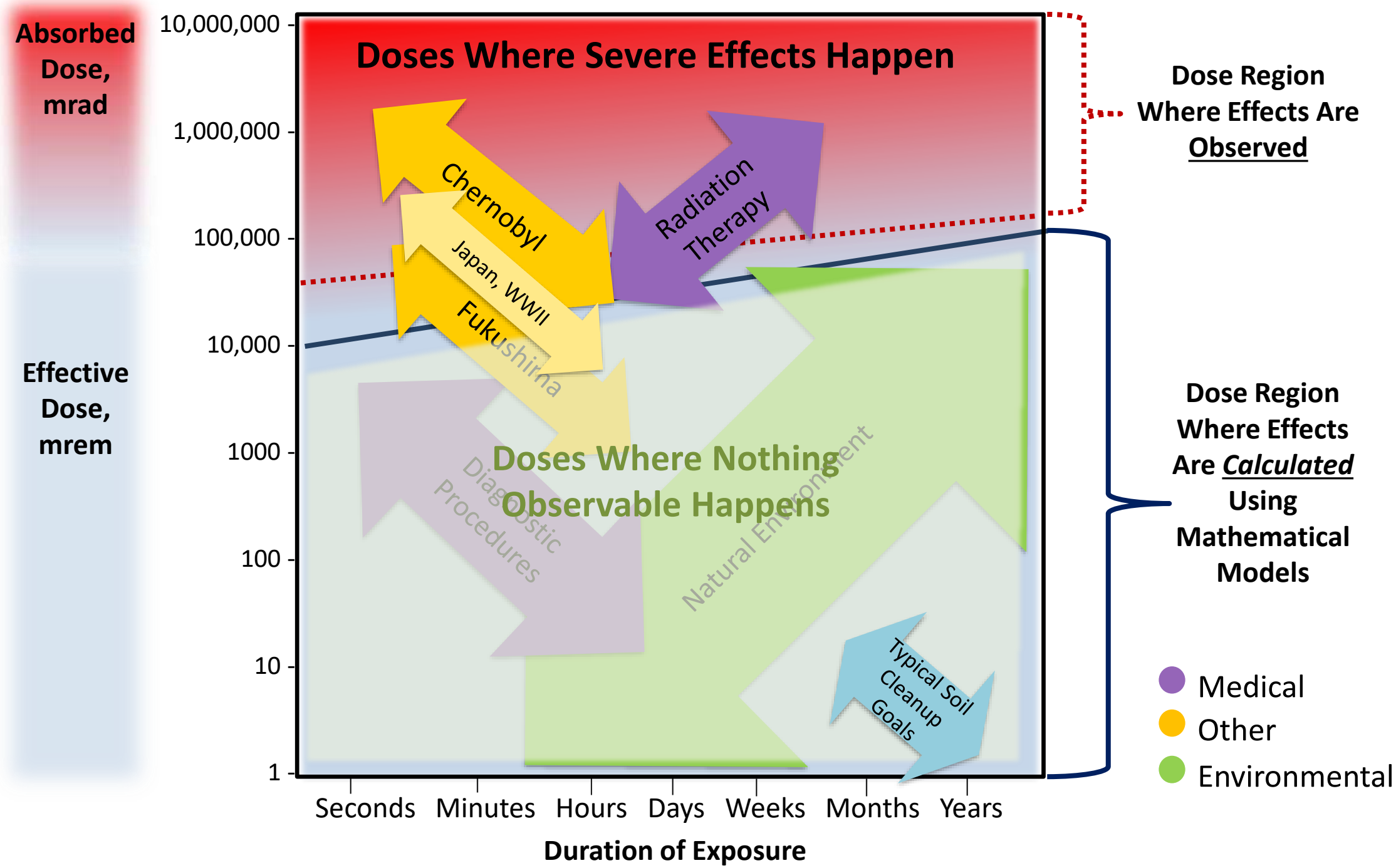
Example: Natural and Other Radiation Sources and Their Doses







HPNS Parcel G workers:
added dose
not measurable
(< 3 mrem/mo)


Absorbed Dose, mrad
Effective Dose, mrem
10,000,000
1,000,000
100,000
10,000
1000
100
10
1
Doses Where Severe Effects Happen
Chernobyl
Japan, WWII
Fukushima
Radiation Therapy
Doses Where Nothing Observable Happens
Diagnostic Procedures
Natural Environment
Typical Soil Cleanup Goals
Seconds
Minutes
Hours
Days
Weeks
Months
Years
Duration of Exposure
Dose Region Where Effects Are Observed
Dose Region Where Effects Are Calculated Using Mathematical Models
Medical
Other
Environmental

Risk can be managed

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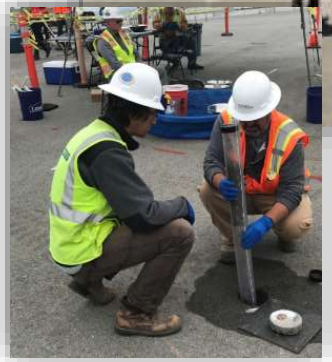

Employment

Home Life

Managing Risk

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https://baynature.org/article/growing-a-greenway-in-hunters-point/

https://sf.funcheap.com/bay-day-india-basin/

Remediation's goal:

Reduce risk for

- site workers,
- the public, and
- the environment

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Thank you.