

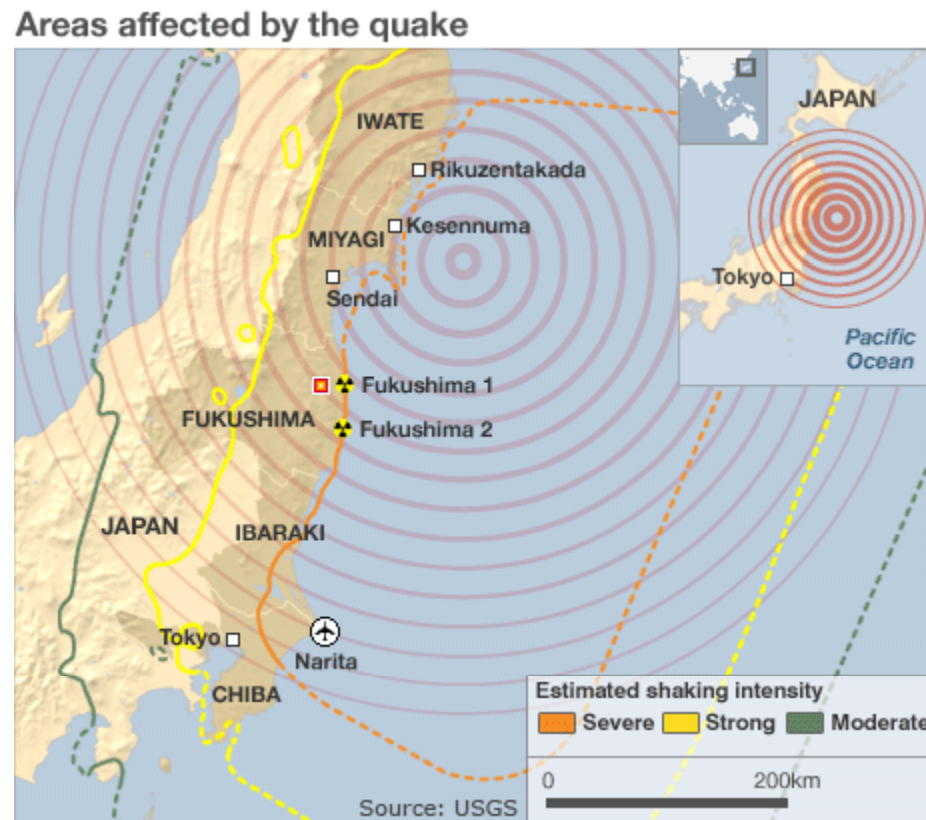
Continued Learning: The Best Defense against an Uncertain Future

Allison Macfarlane

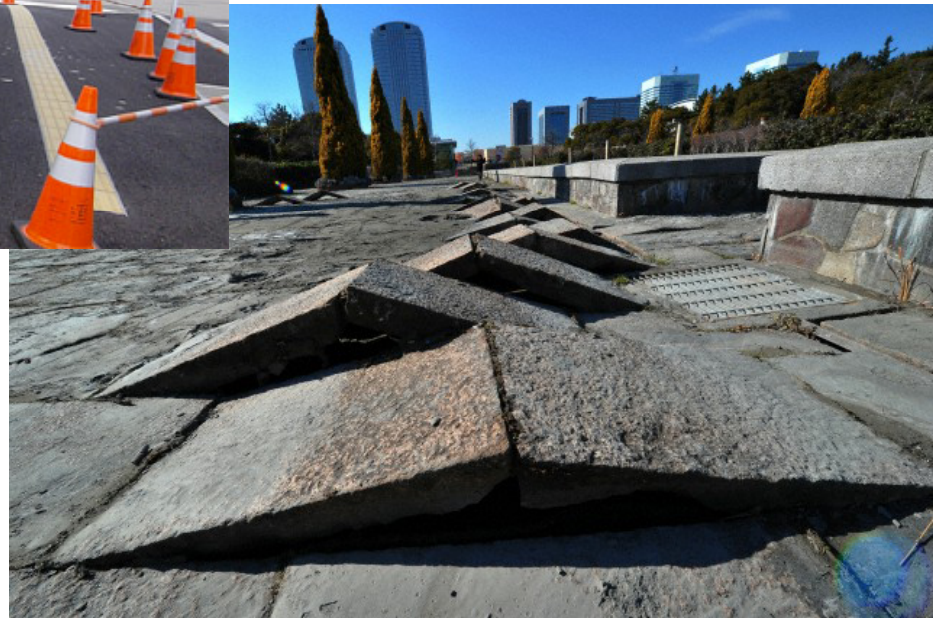
Chairman, U.S. Nuclear Regulatory
Commission

March 11, 2014

Three Years Ago Today



Three Years Ago Today



Three Years Ago Today



Three Years Ago Today



Regulatory Response

NRC Post-Fukushima Safety Enhancements



Regulatory Response



IAEA Mission Praises NRC



“The report by NTTF was... a source of inspiration for many regulatory bodies worldwide.”

NRC's Openness around Fukushima activities



NRC held almost 200 public meetings on Fukushima activities

Public Confidence Was Shaken

Lack of data from Japan distresses nuclear experts

JAPAN: Trust Deficit - Worst Fallout of Fukushima

Fukushima leak erodes confidence in nuclear power

Communication in the Fukushima Crisis
How did officials, scientists, and the media perform?



Preparing for the Unknown

- We need to remain vigilant.
- The future is uncertain.
- Ensuring safety and security will give us the best chance to succeed.



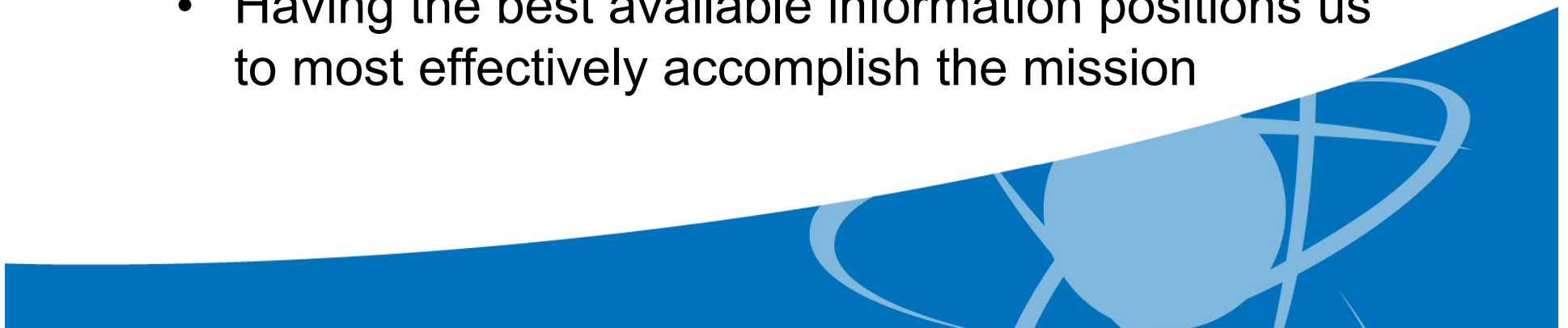
How to Operationalize Vigilance

- What do others know that we don't know?
- How could we not have seen this coming?
 - Commissioner Ed McGaffigan, RIC 2004



The Need for Continuous Learning

- What are other agencies/industries doing?
- What are other countries doing?
- What are we hearing from the public?
- What does the latest academic research tell us?
- Debate is healthy
- Having the best available information positions us to most effectively accomplish the mission



Make Better Use of NRC's Resources

- Use Earth science insights
 - Expect change
 - Redefine “normal”
 - Go beyond historical data
 - We're still learning

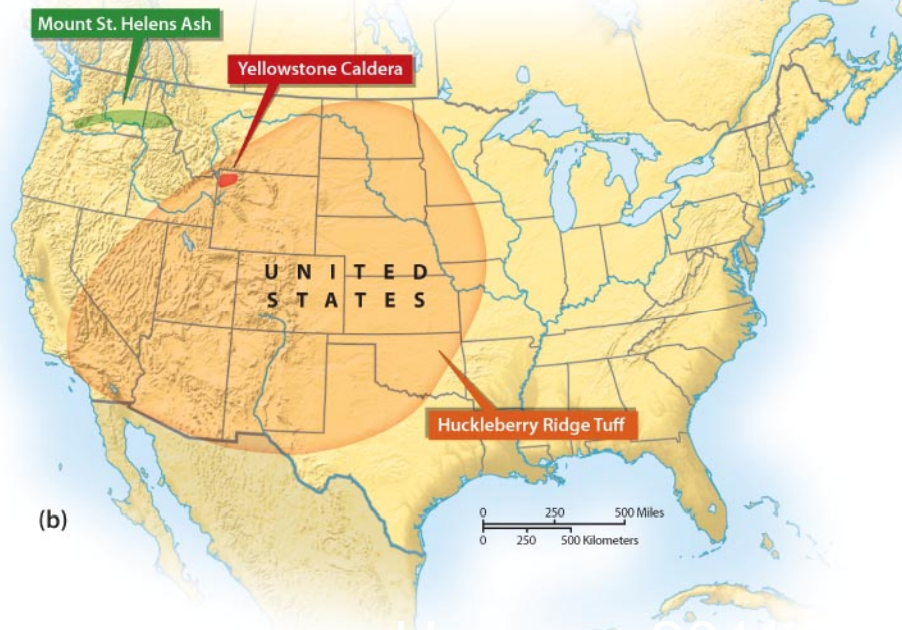
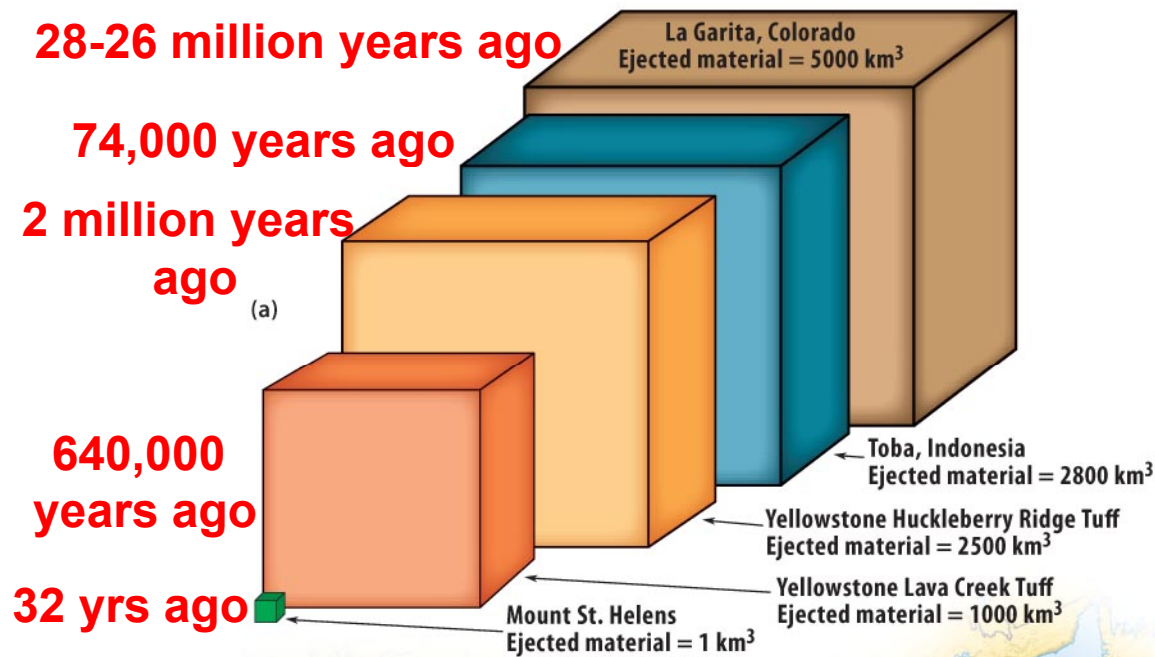


Expect Change

- Earth systems are dynamic and complex
- Climate change might result in changing conditions at plants



The Dynamic Earth: What's "Normal"?



**Largest in recorded history:
Tambora, Indonesia
(200 years ago)**

 **160 km³**

Surprising Subduction Zones

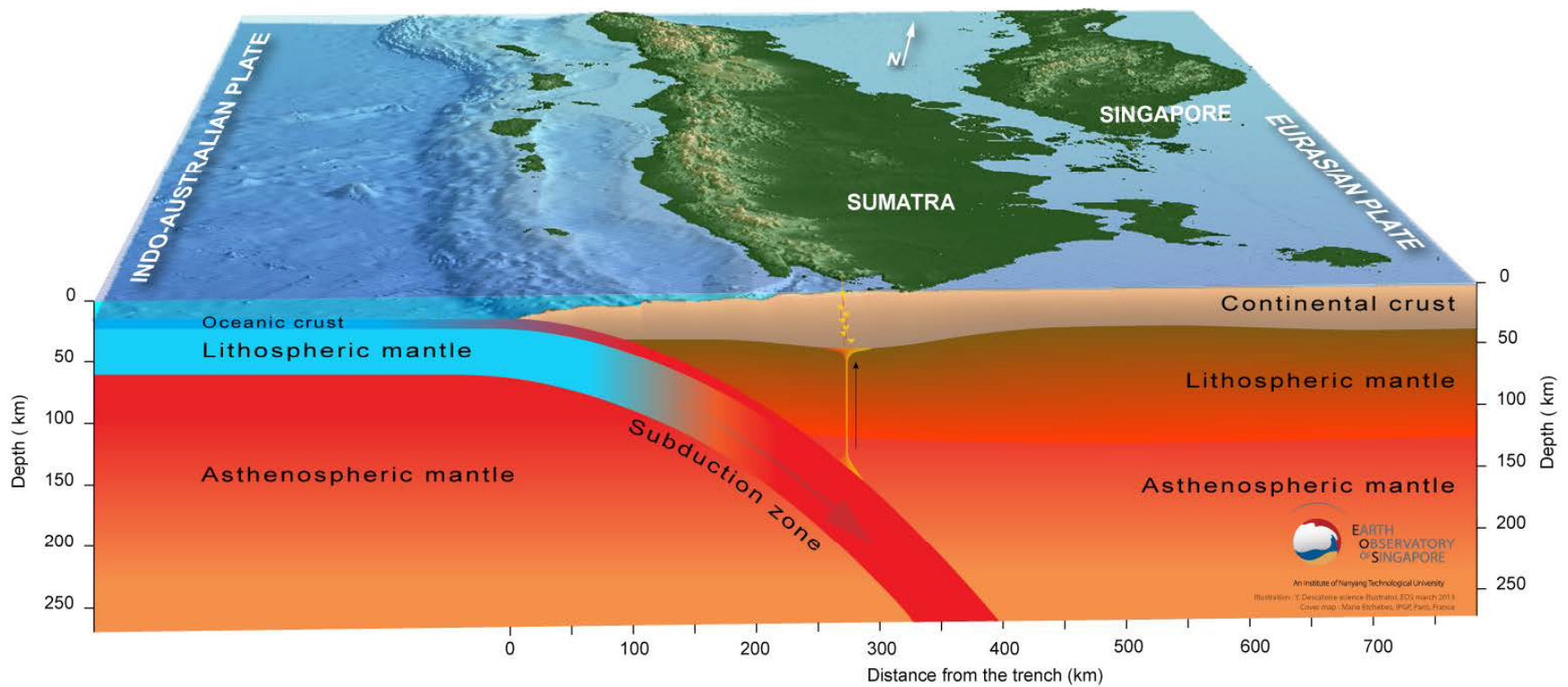
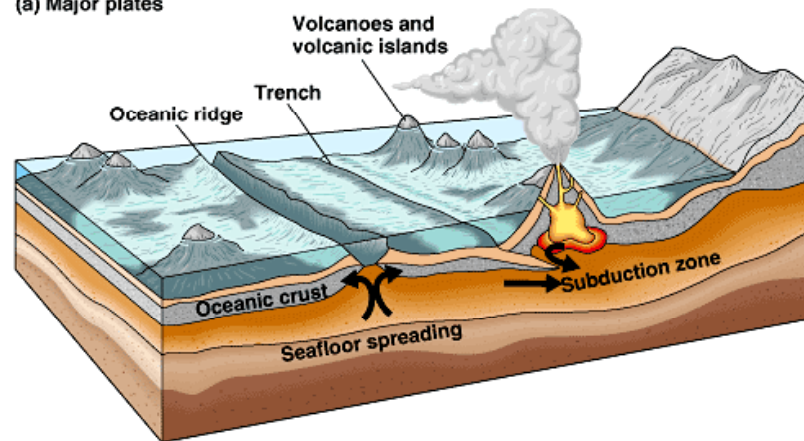


Plate Tectonics: A Theory As Old As... the NRC?



(a) Major plates



(b) Events at plate boundaries

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Questions from Experts

- Can sites respond to prolonged station blackout?
- Are we doing enough to address multi-unit accidents?
- Are spent fuel pools vulnerable?
- How reliable are historical data and risk modeling?



Lessons from Industry

- Fukushima lessons learned
 - Industry input on NTTF report informed NRC order to survive loss of offsite power indefinitely
 - Industry implementation includes portable and offsite equipment (FLEX, regional centers)
- We need to hear from those who implement our regulations



Learning from Other Industries:

What lessons can we learn from this “concrete evidence”?



Ceiling collapse at Boston's “Big Dig”



65' crack in WA's Wanapum Dam

Lessons from the Public



Cumbrian sheep farmers and
Chernobyl fallout: hotspots



Livermore Lab incinerator and Pu
Emissions in the EIS

International Engagement

- Cooperation within the global nuclear safety community
 - Sharing operating experience
 - Exchanging staff
 - New reactor construction
 - Post-Fukushima



International Engagement



- Assistance programs
 - Promoting effective regulation
 - Indigenous regulatory capability is essential
 - Regulation from afar is challenging even for the most competent regulator



What Is An Effective Regulator?

Independent:
free of undue
influence

Well-funded

Sufficient-size
expert staff

Open,
transparent

Support from
highest levels
of government



Measuring Up: The CNS



Informed Decisions and Public Confidence

- Thorough information → good decisions → enhanced public confidence
- More important than ever, as we face changing circumstances

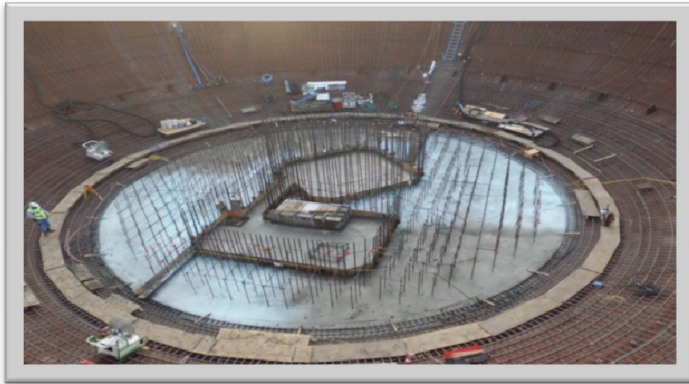


Facing a Dynamic Environment

- The circumstances:
 - Increased focus on decommissioning
 - New reactor construction
 - Continued implementation of post-Fukushima safety enhancements
- The actions:
 - Maintain commitment to core mission
 - Five-year review
 - Be flexible and efficient – get it right the first time!
 - Ensure long-term sustainability of safety enhancements
 - Continued public engagement!



Ensuring Continued Resilience



“Fall Down Seven Times, Stand Up Eight”

-Japanese proverb

