



Earthquakes ★ Floods ★ Hurricanes ★ Landslides ★ Tsunamis ★ Volcanoes ★ Wildfires

Report from the USGS

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FEMA

NIST

National Institute of
Standards and Technology



national **earthquake** hazards reduction program



USGS Participants in SCEC5

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Marcos Alvarez
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Maureen Walton
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Federal Budget Status and Program Planning

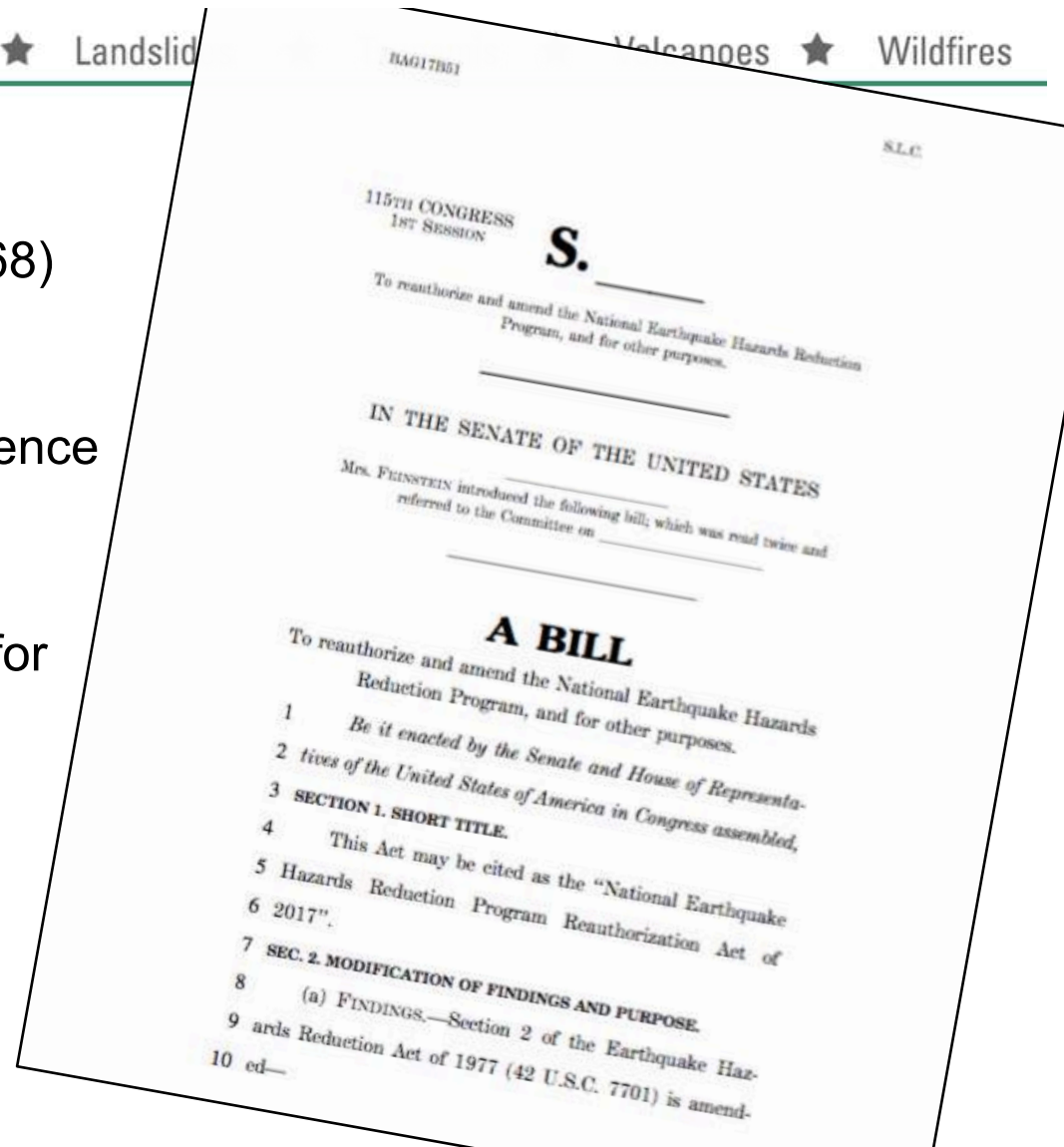
Living on



SHAKY GROUND

NEHRP Reauthorization

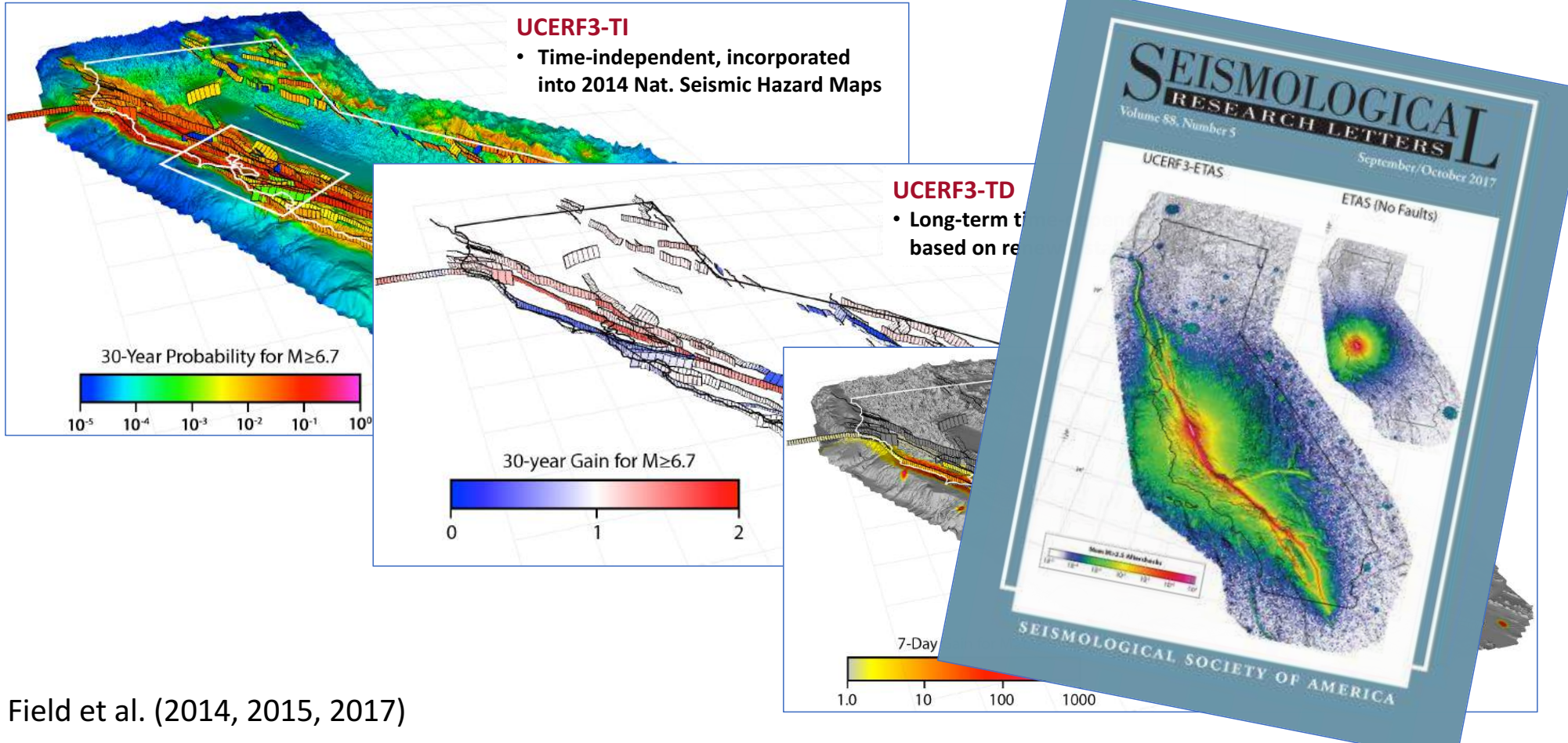
- The NEHRP Reauthorization Bill (S.1768) was introduced by Sens. Feinstein and Murkowski and six others.
- Referred to the Senate Commerce, Science and Transportation Committee.
- Reauthorizes NIST as lead agency.
- Affirms USGS role of issuing warnings for geological disasters.
- Removes language on prediction.
- Calls for a comprehensive assessment of the nation's earthquake risk.
- Establishes a committee to examine buildings and critical infrastructure.



Many areas of SCEC-USGS cooperation

- Earthquake response coordination
- ShakeOut and EEW public education and exercises
- A new generation of TAG's
- A focus on shallow structure in hazard assessment
- CSEP (Collaboratory for Study of Earthquake Predictability)
- Earthquake Gates and improved modeling of ruptures
- Operational Earthquake Forecasting, Powell Center workshops
- Employing CyberShake in regional PSHA
- Expanding applications of InSAR data, Community Geodetic Model
- Earthquake simulators
- Supporting response planning and risk mitigation by a range of stakeholders

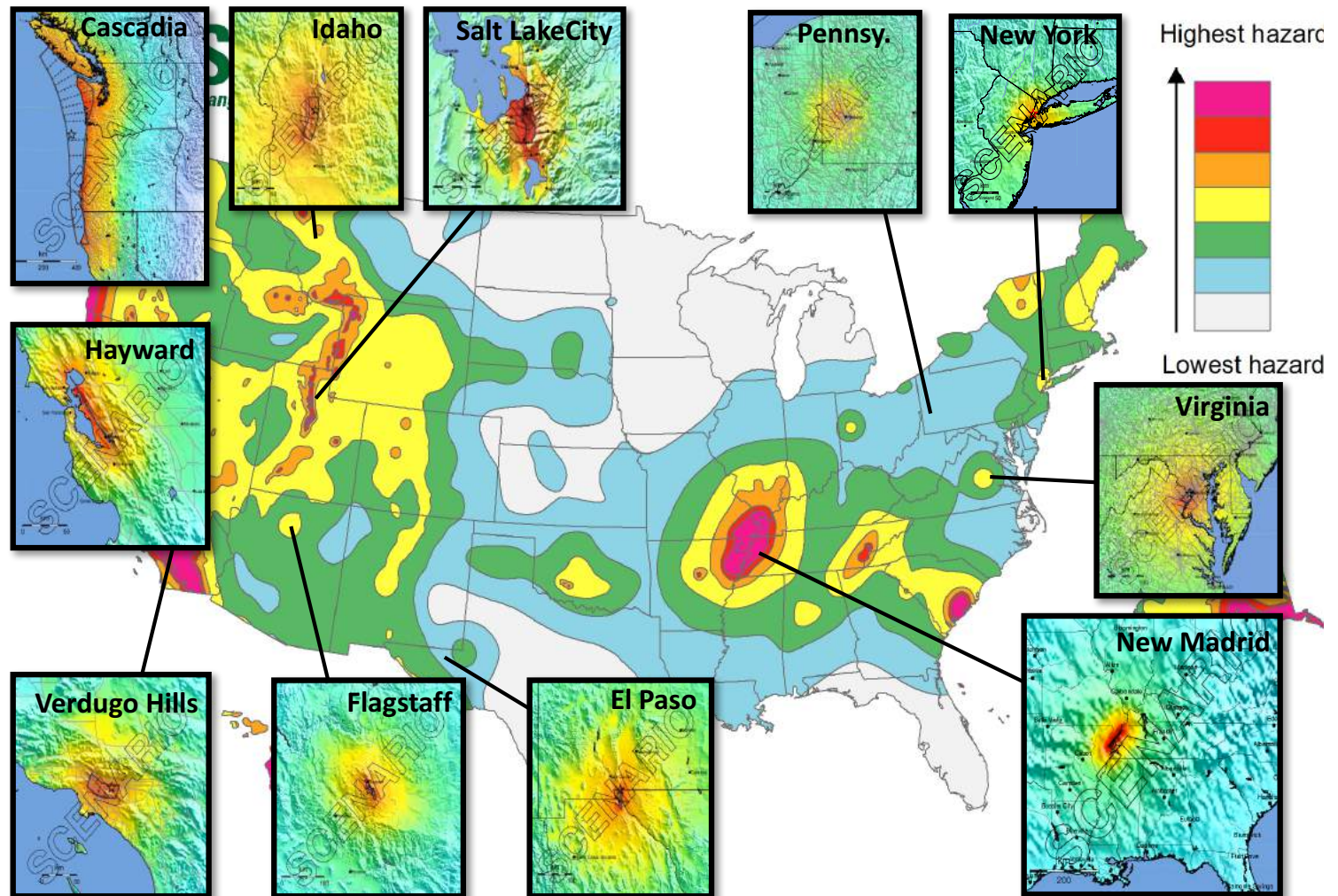
Uniform California Earthquake Rupture Forecast (UCERF3)



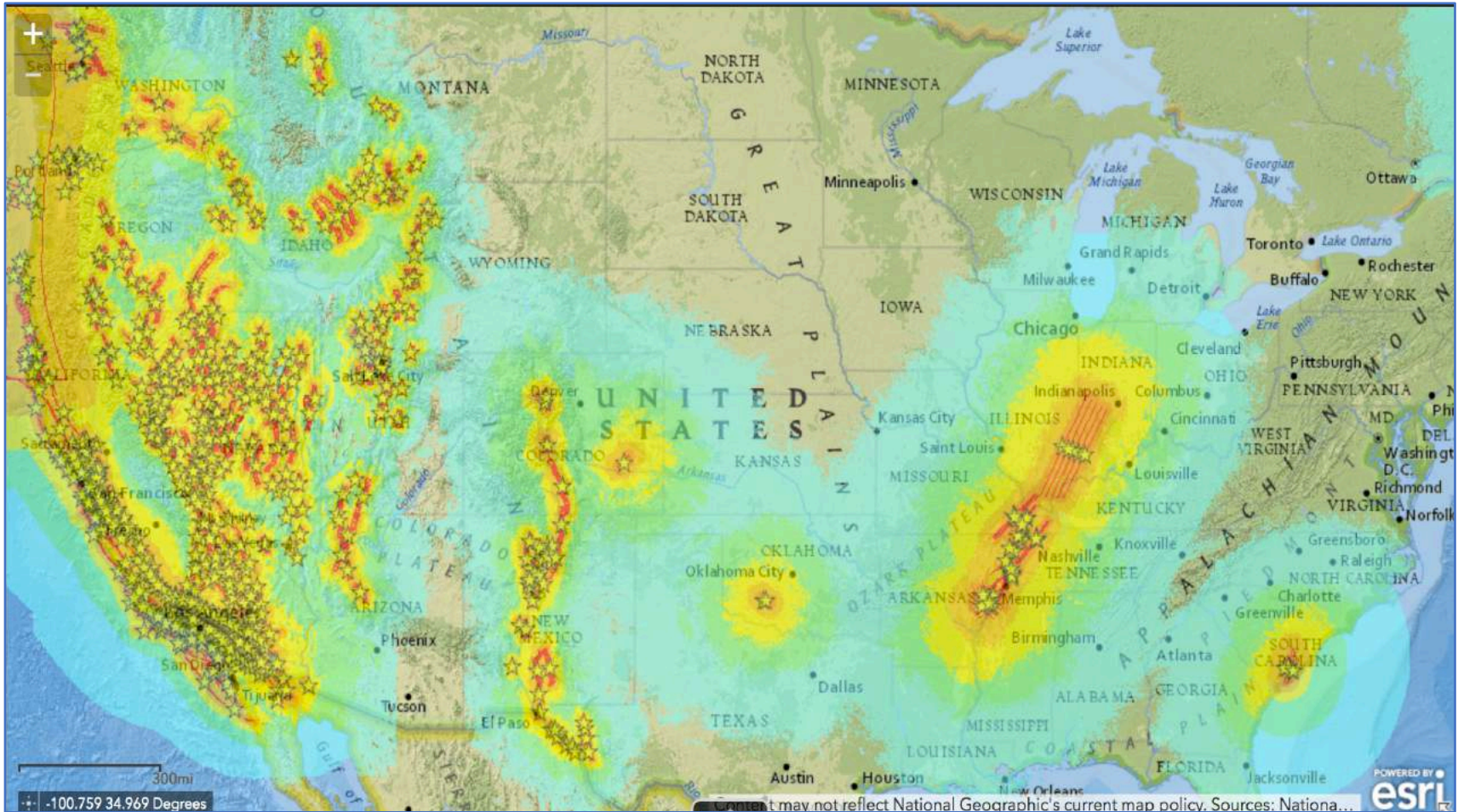
Field et al. (2014, 2015, 2017)

Scenarios

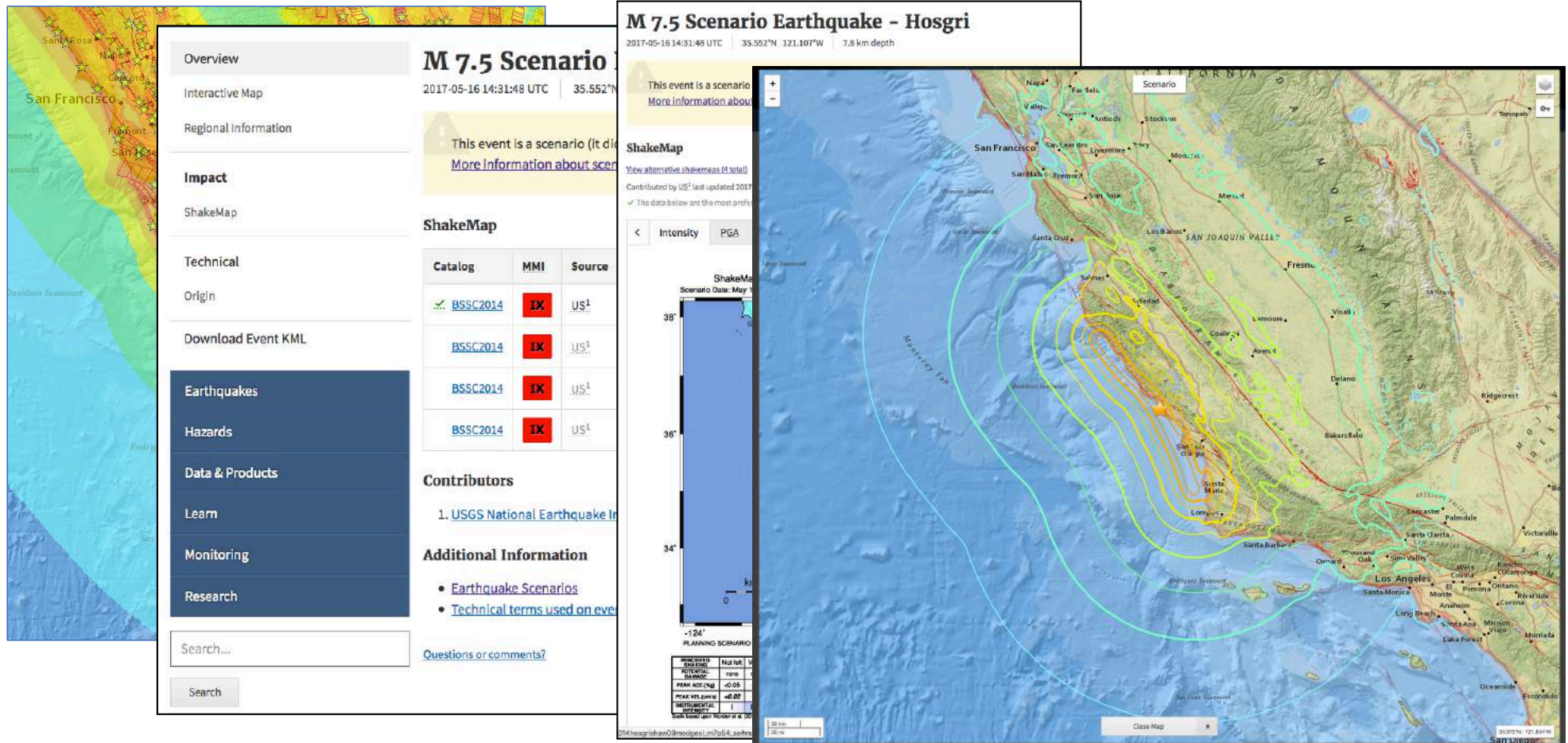
- Scenarios ShakeMaps are in great demand.
- Until now, these were created ad hoc as needed.
- A systematic, searchable library of ShakeMap scenarios is now available.
- >800 scenarios for the lower 48.



Searchable library of ShakeMap scenarios



Searchable library of ShakeMap scenarios



SCEC & USGS can Improve Earthquake Scenario Science

Scenario Science:

- Add basin effects & directivity effects with empirical/physical models; employ 3D simulations, where suitable.
- Add ground motion complexity: rupture & ground motion spatial variability; more comprehensive path & site effects.
- Improve & calibrate loss models: refine country & regional loss models. Improved ShakeMap Atlas for calibration. PAGER & Hazus comparison & calibration.
- Improve ground failure models: provide probability maps & improve loss functions.

Coordination and access:

- Coordinate on development across a range of platforms (BBP, etc.)
- Improve access to 3D results generated by individual scientists
- USGS can catalog scenarios for centralized access by scientific community

Putting scenarios to use:

- Expanded uses of 3D simulations; including depth-to-basement in Nat'l Seismic Hazard Map
- User coordination: Scenario-based exercises. Education & guidance for new uses/users.

Subduction Zone Science Plan

- USGS has published a strategic plan to advance subduction zone science
- A blueprint for prioritizing and expanding USGS activities across a broad range of sciences
- And delineation of USGS interests and potential participation in a broader effort such as “SZ4D”
- A focus on meeting the needs of stakeholders, through observations, models, analyses, and forecasts to support situational awareness, hazard assessment, and risk mitigation



HayWired Scenario

- ShakeOut-style, scientifically plausible, comprehensive scenario for a M7 earthquake on the Hayward Fault.
- Three volumes of papers.
- Public release on April 18, 2018.
- Enhanced focus on impacts to emerging infrastructures, including telecommunications.
- USGS SAFRR project has led the development of HayWired.
- A growing HayWired Coalition of stakeholders.

