Trusted Data Sharing and Imagery Workflow for Disaster Response in Partnership with the State of California

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The Problem

- Providing actionable data for situational awareness following a disaster is critical to decision makers
  - Improves their ability to anticipate requirements and provide appropriate resources for response.
  - Essential Elements of Information (EEI) necessary to achieve situational awareness are often generated from a wide array of organizations and disciplines, using any number of geospatial and non-geospatial technologies.

We must work to **enable coordination** between research scientists, applied scientists and decision makers in order to **reduce duplication of effort**, **maximize information sharing**, **translate scientific results** into actionable information for decision-makers, and **increase situational awareness**.

Information Sharing Between Multiple State, Federal, Local Organizations through XchangeCore connected applications

Clearinghouse Objectives

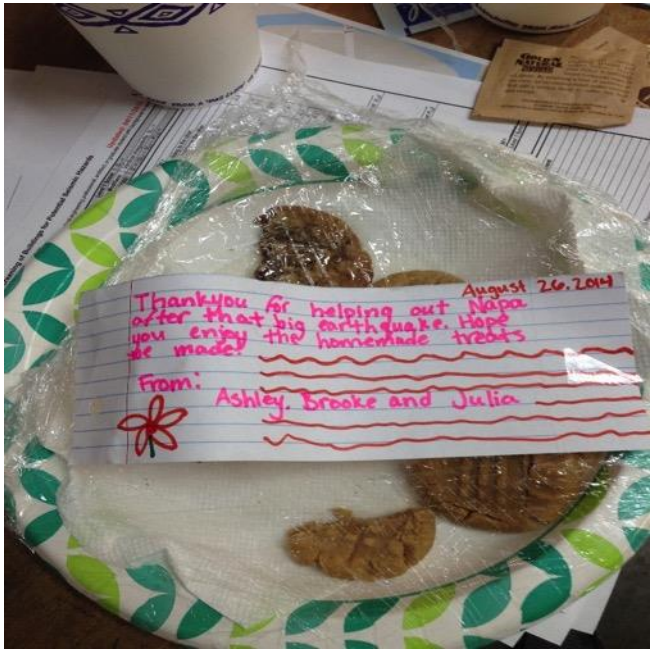
• Facilitate field investigations by earth scientists, engineers and social scientists, who converge on the disaster site

• Assist researchers in accessing perishable data through coordination with emergency management organizations and law enforcement

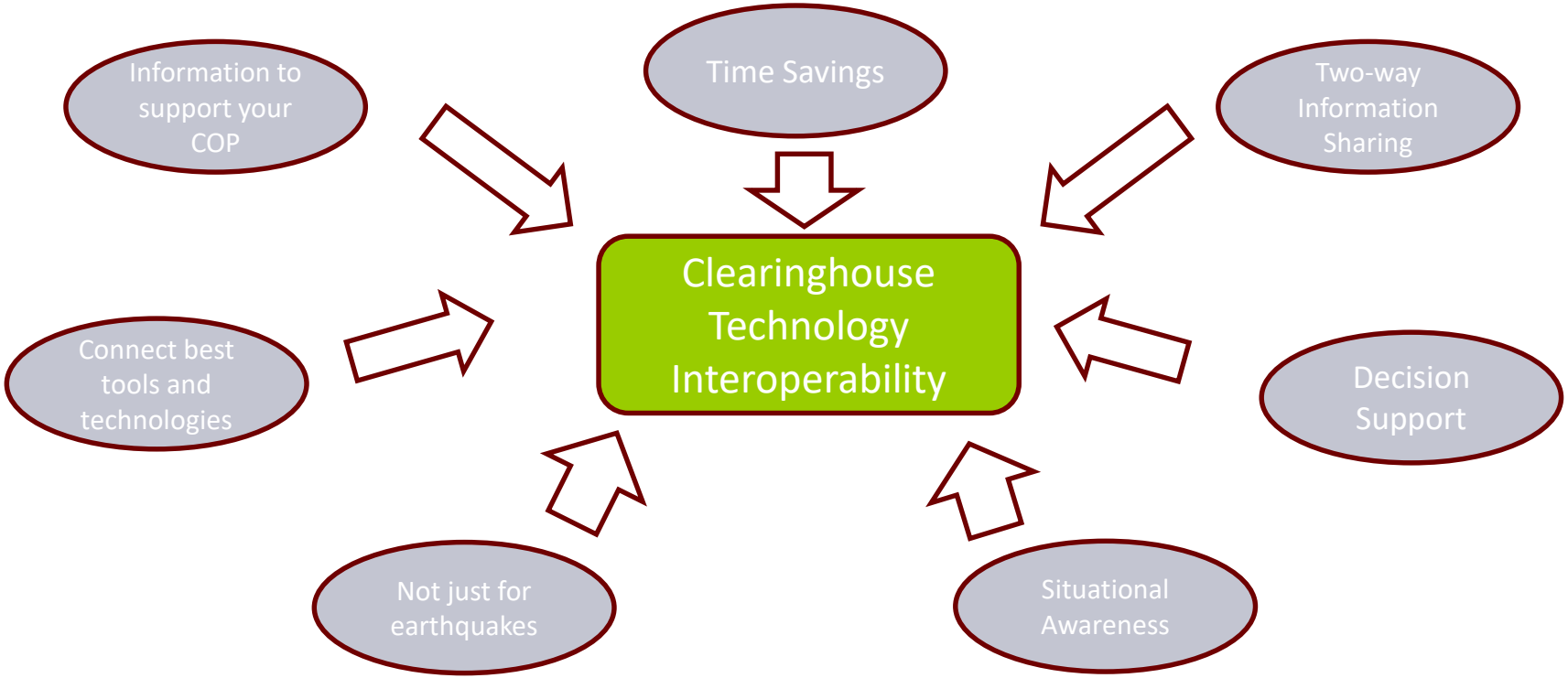
• Provide a forum for sharing information via meetings at a physical location (field office) and through our new virtual Clearinghouse

• Track fieldwork progress and minimize duplication of effort; organize data and imagery collected via various technologies and applications and synthesize information for response agencies

• ***Clearinghouse does not direct or control activities of participants***

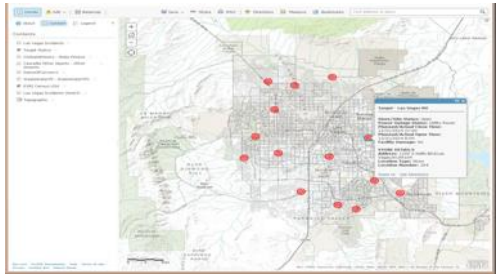


Value of Clearinghouse Data Sharing Efforts



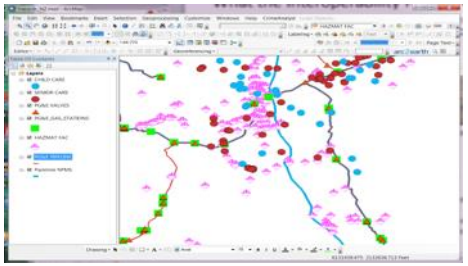
Incident Situational Awareness Exchanged

AGOL



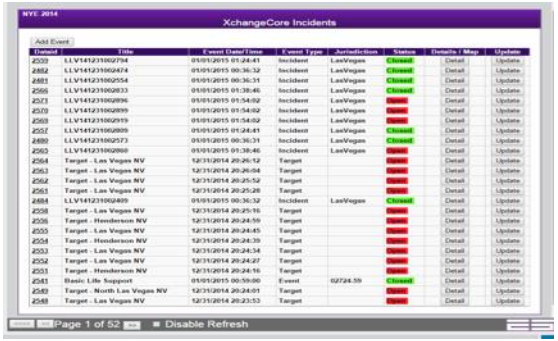
Google Earth

ArcGIS



Common Operational ***DATA*** Shared to different technologies

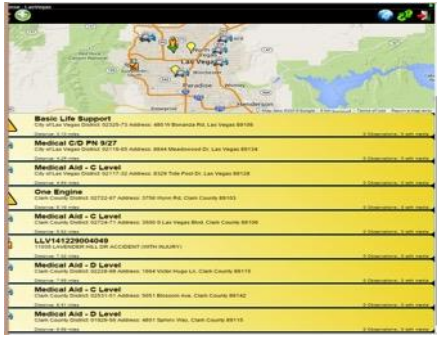
Web EOC



XchangeCore

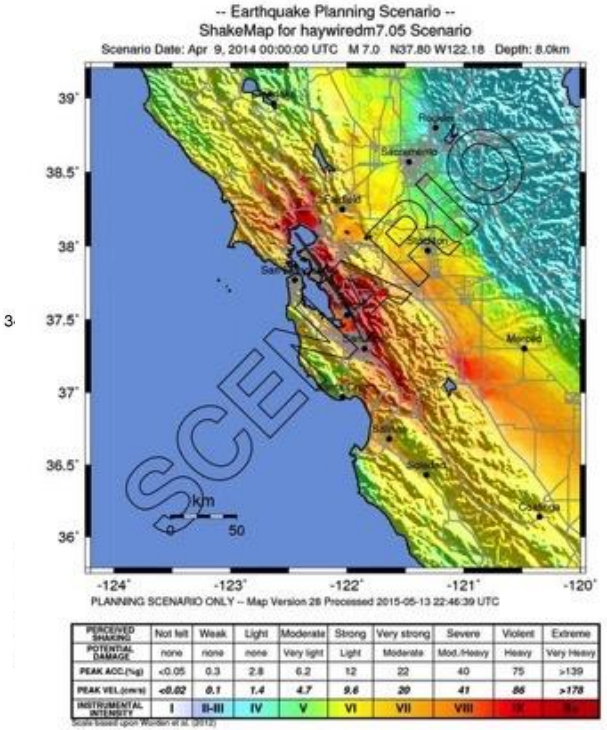
Incidents Exchanged between WebEOC/CalEOC and SpotOnResponse

Mobile Aps



The Exercises

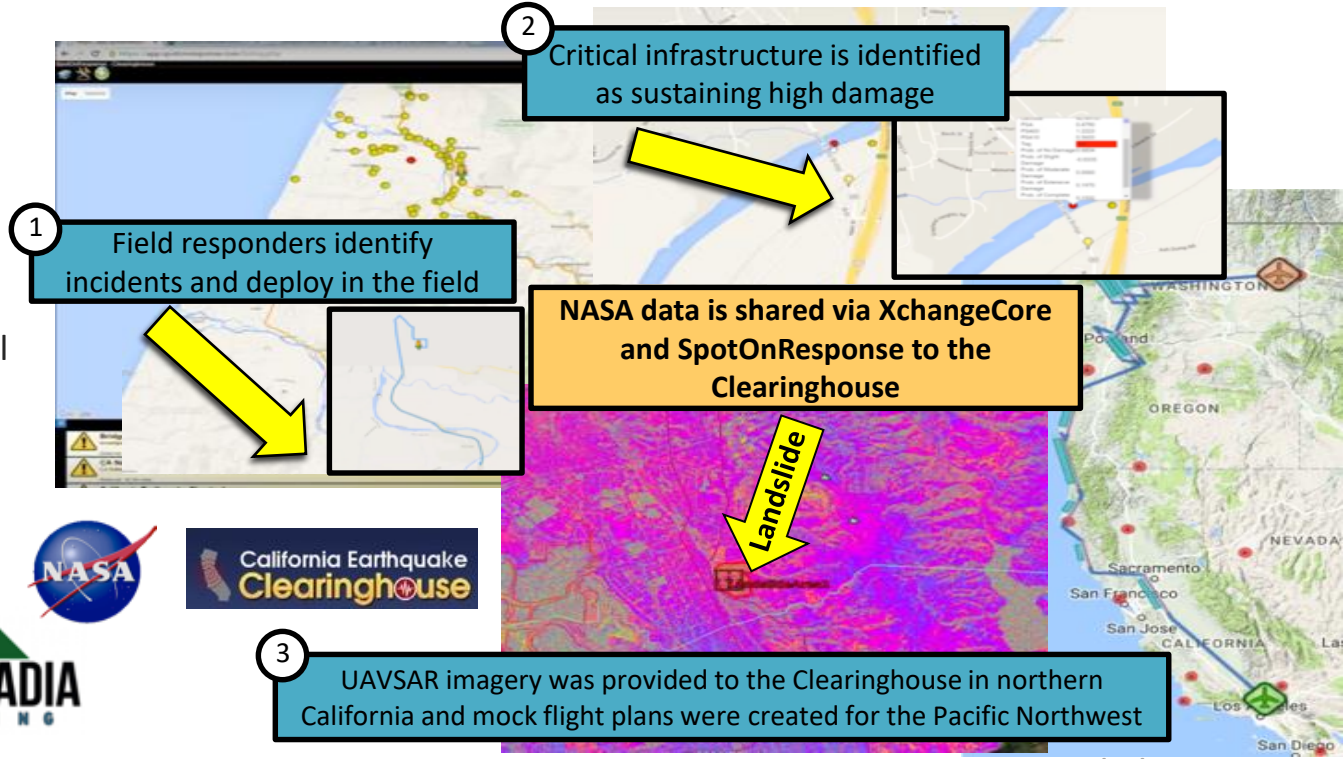
- Cascadia Rising was a FEMA National Level Exercise held 7-10 June 2016
  - The scenario included a M 9.0 earthquake resulting in the complete rupture of 700-mile Cascadia Subduction Zone that triggered a tsunami and multiple aftershocks
- Vigilant Guard 17 was a Full Scale National Guard Exercise hosted by California and Nevada held 10-14 November 2016
  - The scenario included a M 6.0 earthquake east of Las Vegas and a M 7.8 earthquake in southern California with multiple aftershocks
- Haywired 2017 California Exercise is an earthquake scenario to model and study impacts on the San Francisco Bay area from a Mw 7.05 earthquake on the Hayward fault (planned early 2017)
  - Builds upon understanding of the last large earthquake to occur on the Hayward fault in 1868
  - Considers that modern urban infrastructures are made vulnerable by multiple layers of interdependencies between lifelines
  - Also considers impacts from a sequence of aftershocks following the main earthquake



Data Sharing to the Clearinghouse: Cascadia Rising

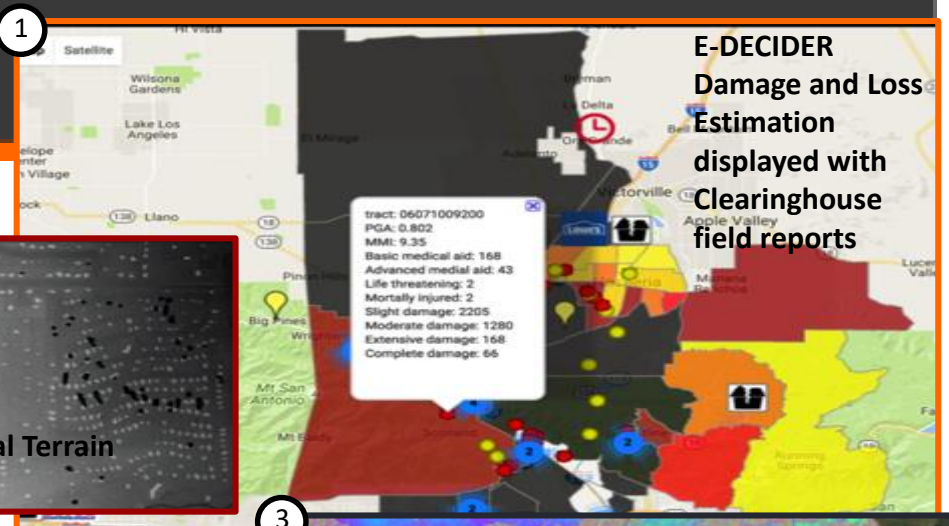
- The California Earthquake Clearinghouse held a parallel exercise focused on interdependencies of critical infrastructure, information sharing, and coordination for response, recovery, and regional resiliency

- NASA participants supported the Clearinghouse through XchangeCore Web Service Data Orchestration and SpotOnResponse



Vigilant Guard 17

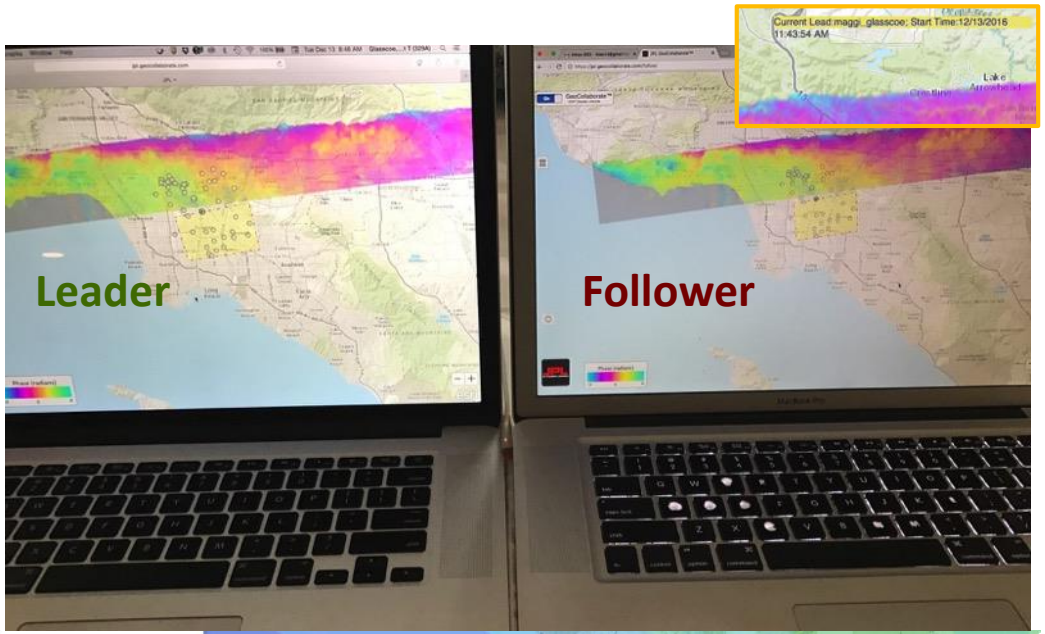
- The California Earthquake Clearinghouse, California National Guard, and partners (including NASA) participated from 14-20 November 2016
- NASA provided response products and remote sensing imagery to the Clearinghouse via XchangeCore Web Service Data Orchestration for integration with field response and decision support
- NASA representatives also participated with National Guard imagery analysts at the Joint Operations Center at Beale AFB to provide product integration and analysis support
- NASA provided (1) rapid response assessment products from E-DECIDER and imagery from (2) Airborne Snow Observatory (ASO), (3) Uninhabited Aerial Vehicle Synthetic Aperture Radar (UAVSAR), and (4) AVIRIS (Airborne Visible/Infrared Imaging Spectrometer)



Real-time collaboration: GeoCollaborate®

- GeoCollaborate® enables users to access, share, manipulate, and interact across disparate platforms
- Connects public and private sector agencies and organizations rapidly on the same map at the same time
- Allows improved collaborative decision making on the same datasets simultaneously
- StormCenter and JPL, through the ESIP Disasters Cluster have been developing a testbed to demonstrate this capability

JPL Testbed with lead/follow displays



Conclusions

- Allow each organization to use the specialized tools and technologies that best support their roles and responsibilities in responding to a disaster—ANY disaster, not just earthquakes.
- Individuals liberated from the routine, mundane, *critical*, but very time consuming, tasks of moving, sharing, organizing and managing data, when you least have the time to do so, i.e. when you're trying to prepare for an Executive Briefing!
- Data experts and analysts have more time to perform the most critical and important tasks they need to complete to support disaster response efforts.
- Better coordination among participating Clearinghouse organizations (subject matter experts in the field and responders in EOCs)
- EOC managers can make informed decisions about logistics and resources when they have real-time information about the disaster impacts

Thank you for your attention!

Questions?

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