

RELIEF



Research & Experimentation for Local & International Emergency First-Responders

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Director's Corner

February 2012 [Issue 4]

RELIEF 12-2 proved to be another successful event with more than 70 participants tackling ongoing problems involving communications and information sharing during humanitarian emergencies. Concurrent with technological experimentation a small team of experts joined RELIEF for a two-day discussion of how to rethink the deployment of physical infrastructures (e.g. power, water, shelter, etc.) during village stability operations.

Additionally, the National Geospatial Intelligence Agency, the US Agency for International Development-Office of Foreign Disaster Assistance, and the State Department's Humanitarian Information Unit continued the exploration of how to release commercial satellite imagery to digital volunteers like OpenStreetMap. The February experiments gave us first glimpses into a technology that have evolved (in part) as a result of RELIEF—that is, received funds based on work that had been performed in the field environment. We were excited to see the alpha version of Field Papers, a project that enables teams to print out maps and to scan annotations directly back into GIS systems via their cell phone cameras. Field Papers used the RELIEF platform to expand the functionality in its predecessor (Walking Papers). Using funding from Rapid Reaction Technology Office, the project has added Ushahidi crowdsourcing integration and revamped its backend.

Cellular technologies continued mashups involving crowdsourcing, including integration between MedWeb (a telemedicine platform on 40 grey hulls), Tethr and OpenBTS. A new Joint Concept Technology Demonstration called ROGUE—an open-source, unclassified platform that will connect the DoD more effectively with volunteered geographic information-had an opportunity to work directly with the vendor, OpenGeo, to explore integration with both the DOE's RaptorX situational awareness platform and Field Papers.

The emergency command and control team and Stalker teams from Lockheed Martin were joined by smaller organizations with new technologies, including the Gatewing small survey UAV, MutualLink's VPN/peer-to-peer communications tools, and NPS Remote Sensing Center's Field Spectroscopy and Aerial LIDAR experiments. Thank you all for creating another fun and productive event. Please don't hesitate to provide us feedback—we look forward to hearing from you.

Ray Buettner

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RELIEF 12-2

EXPERIMENTATION RECAP

Assessment from Above

The Naval Postgraduate School's Remote Sensing Center (RSC) team attended RELIEF to conduct two field experiments connected with DHS funded earthquake response and recovery efforts. Using old damaged barracks in the cantonment area of Camp Roberts as a surrogate for earthquake damage, LIDAR (Light Detection and Ranging) data were used for damage assessment. The LIDAR sensor flown earlier collected millions of XYZ coordinates for the area of interest that were interpolated to create a 3D model of the surrounding terrain. Imagery was draped on the surface to texture the model and make damaged buildings more easily identifiable. Stakeholders from the response and recovery sector successfully identified those buildings that appeared damaged. The team then validated the results. Using their field spectrometer, the RSC team measured the electromagnetic absorption of several samples at wavelengths in the visible and infrared. The team successfully captured data that will be used to identify features based on their spectral signature. Further research will focus on collecting samples for roof materials to assist response and recovery stakeholders with correlation of aerial hyperspectral imagery and damaged materials. *For more information, please contact Chris Clasen (ccclasen@nps.edu)*



UAVs: Not Just for the Military

An active collaborator with many of the organizations present at the event, Gatewing NV brought a unique capability to the event: The X100, a lightweight, fast flying mapping system that provided 3D imagery of many different parts of Camp Roberts, including detailed assessments for the base's archeologists and biologists! Tying in with Microsoft's GeoSynth application, much of the X100's imagery was processed into a point cloud in the field from a laptop. Designed as a surveying tool, the X100 proved to be a diverse tool for map-

ping in varied conditions, a valuable asset in any post disaster setting. *For more information, contact Joseph Paiva (jvrpaiva@gatewing.com).*

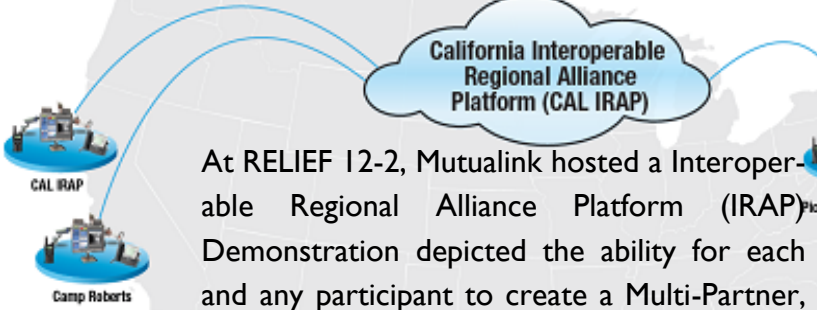
Visit www.npsrelief.org to view the 12-2 event

Quick Look Report

12-2 Experimentation Threads

- ⇒ **Aerial Field Spectroscopy of Tarps in Post-Disaster Settings—Naval Postgraduate School**
- ⇒ **Structural Damage Assessment Utilizing Aerial LIDAR—Naval Postgraduate School**
 - ⇒ **Disaster Imagery UAS—Gatewing NV**
 - ⇒ **Field Papers—Walking Papers**
- ⇒ **Lightweight and Resilient Cellular Networks—Range Networks, LLC**
 - ⇒ **Crisis Mapping & Communications—Tethr**
- ⇒ **Cellular Situational Awareness and Control—Lockheed Martin**
 - ⇒ **Mobile Operations Center—Lockheed Martin**
 - ⇒ **IRAP Interoperability—Mutualink**
- ⇒ **Nextview Imagery Sharing—National Geospatial Intelligence Agency / Department of State Humanitarian Information Unit**
- ⇒ **Infrastructure as a System—National Defense University / Burners without Borders / Synergy Strike**

Common Operating Picture: CAL IRAP



At RELIEF 12-2, Mutualink hosted a Interoperable Regional Alliance Platform (IRAP) Demonstration depicted the ability for each and any participant to create a Multi-Partner, Multi-Modal, Federated Session, spanning all levels of command, strategy, planning and field operations, to support ad-hoc, pre-defined or emergency ops where each participant maintained complete control over their personnel, two way radio and telephony communications assets and their video distribution resources. This was conducted while demonstrating the ability to create n-Scale, federated, Ad-Hoc, centerless sessions on the fly and share live UAV video stream of Camp Roberts with a larger community of interest for improved land, air domain awareness. Additionally, potential usefulness across Sea Domain was demonstrated. For more information, please contact Steve Scott (sscott@mutualink.net)

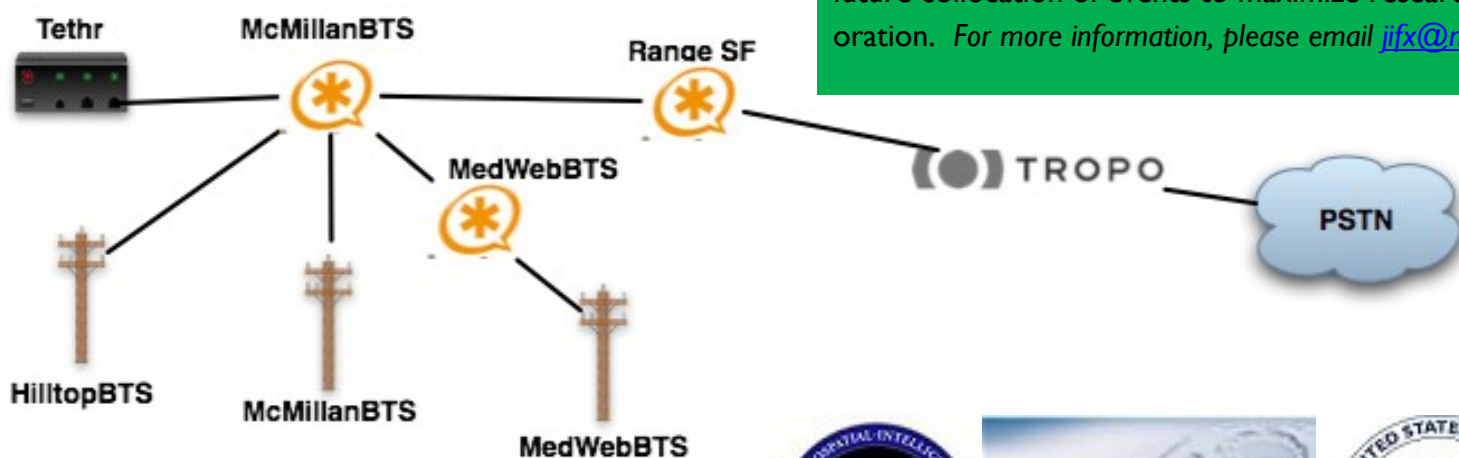
Creating Situational Awareness

Lockheed Martin conducted two experiments during this event. The first, focused on Cellular Situational Awareness, demonstrated direction finding for any device and the ability to detect cellular hardware configurations, the ability to capture all SMS text messages in a given area, the ability to disseminate specific messages to target groups, and the capability to provide seamless voice across heterogeneous communication networks to all participants in a humanitarian relief scenario. The LM team further experimented on enhanced situational awareness through their Mobile Operations Center. Utilizing Stalker, a small Unmanned Aircraft System with EO/IR and voice communications, a Mobile Ops Center was demonstrated, bringing together seamless voice and video. For more information, please contact Russ Chan (russ.chan@lmco.com)



Austere Networks

Several organizations teamed up to explore different connection methods between the first responder community during disaster response. While Range Networks supplied the man-portable, 2.5G GSM cell sites with self-contained power and running OpenBTS software, Tethr explored leveraging this network to create a direct link from a cellular network into the open-source Ushahidi crisis map. This allowed for any cell phone user to create a crisis report directly to Ushahidi via SMS. Additionally, MedWeb joined the mix and received SMS's into their medical network. *For more information, please contact David Burgess (david@rangenetworks.com).*



What is JIFX?

RELIEF 12-2 coincided with the prototype Joint Inter-agency Field Experimentation (JIFX) event. Based on the model pioneered at the Naval Postgraduate School (NPS), JIFX aims to provide a venue for US Combatant Command (COCOMs) and federal interagency groups to articulate and solicit their Science & Technology (S&T) needs to the broader research community. This in turn allows NPS to organize JIFX events that represent the most relevant research towards government capability gaps. Although RELIEF will remain an autonomous entity within this community, we look forward to future collocation of events to maximize research collaboration. *For more information, please email jifx@nps.edu*

Nextview Imagery Sharing

Building on the successes from the 11-4 event, the State Department's Humanitarian Information Unit (HIU) and the National Geospatial Intelligence Agency (NGA) have been working to extend the utility of commercial high-resolution satellite imagery purchased by the United States Government under the NextView license. Historically the HIU has acted as the US government's clearinghouse for NextView imagery requests from the United Nations, other International Organizations, and Non-Governmental Organizations. The HIU's goal is to continue sharing satellite imagery with those partners equipped to utilize the data in its native format, and more importantly, expand the utility of the data by sharing it in easier-to-use web service formats. Joined by representation from the US Agency for International Development's Office of Foreign Disaster Assistance (USAID-OFDA), the team created a proposal for revisions to the Nextview imagery license that would accommodate the sharing of commercial imagery with NGO's through a workflow designed at previous RELIEF experiments. Identifying that key advancements in technology have yet to be addressed in the current license, such as web based image services and tile caches, the interagency group plans to run a full scenario of the process at the August RELIEF event, using HIU's new technological capability to provide imagery web services ingested by the Humanitarian OpenStreetMap Team Tasking Server. *For more information please contact Katie Baucom (Katherine.p.baucom@nga.mil) or Josh Campbell (campbellj3@state.gov).*



Presentations

An end-user perspective

Composed largely of veterans and emergency response professionals, Team Rubicon positions itself as a rapid response force providing immediate and valuable manpower and expertise to post-disaster settings. With branches aimed at both international and domestic events, Team Rubicon maintains a highly skilled team complete with search and rescue skills and medical expertise and the availability to deploy to any corner of the world on short notice.



Josh Webster and Jesse Levin were active participants in many discussions that occurred throughout the week. In addition to providing an end-user perspective to many of the technologies and processes under discussion, Josh gave an informative presentation overviewing the objectives of Team Rubicon and highlighting the team's ongoing response to the Tornadoes in Missouri. A valuable member of the National Defense University's TIDES network, RELIEF looks forward to future and ongoing participation by members of Team Rubicon. For more information, please contact Joshua Webster (webster@teamrubiconusa.org).

A photograph of the Dudley Knox Library building, featuring a modern design with large windows and a prominent sign that reads 'DUDLEY KNOX LIBRARY' in white capital letters against a dark background.

DUDLEY KNOX LIBRARY

There's an app DATABASE for that...

Representing the Naval Postgraduate School's Dudley Knox Library, Andrea Davis gave a one hour presentation on digital resources and databases. Digitally co-presented by Stephanie Anabo from the [Homeland Security Digital Library](#) (HSDL), the discussion covered useful resource and repositories of information that address HA/DR topic areas. Leveraging a real-life user case for Team Rubicon, who was at the time occupied with managing tornado response in Missouri, the discussion showed firsthand how specific needs often tailor which database(s) best suite your organizational requirements. The discussion touched on different methods for utilizing databases at an organizational level, as well as research tactics for quickly obtaining pertinent HA/DR information during a crisis. Valuable to the HA/DR community, database management and utilization is an emerging area of interest to the RELIEF community both as a resource for finding information, and as a framework for capturing new found knowledge. For more information, please contact Andrea Davis (andavis@nps.edu).

On a side note, NPS is proud to announce that *Library Journal* has awarded Davis a "Movers & Shakers" award in 2012 for her continually original and impactful contribution to library sciences. Way to go Andrea!



What's Next...

RELIEF 12-3 & 12-4

- ⇒ RELIEF 12-3 will be held in Washington, DC in mid-May. Location & time are yet to be determined.
- ⇒ RELIEF 12-4 will coincide within JIFX 12-4, 13-17 August in Camp Roberts, CA.

Questions?

Email: relief@nps.edu

JIFX (Including RELIEF):

By the Numbers

- ⇒ **390** Participants
- ⇒ **49** Experiment Threads
- ⇒ **9** Ad Hoc Experiments
- ⇒ **43** Soldiers/Marines representing 6 different units
- ⇒ **35** Government Organizations
- ⇒ **49** Private Industry / Non-Government / Non-Profit Organizations
- ⇒ **7** Academic Institutions
- ⇒ **15** Virtual Participating Organizations

Please visit our

[website](#) to:

**(I) Download the 12-2
Quick Look**

Report (QLR)

**(I) Apply to join us in
May and August**