# RELIEF

Research & Experimentation for Local & International Emergency First Responders

**August 2012 [Issue 5]**


**In this edition**



**Visit our [webpage](#) for more details**

## Director's Corner

A big thank you to everyone who made RELIEF 12-4 a huge success! Collocated for the second time with the Joint Interagency Field Exploration (JIFX) event, 329 people from 129 organizations braved the extreme August heat to contribute to exceptional innovation and groundbreaking research. With experiments ranging from large scenario-based research and policy discussions to smaller experiments that tested new tech solutions, the 12-4 RELIEF event featured 21 independent research threads. All relating to different challenges present in the humanitarian assistance & disaster response realm, the 12-4 experiments were organized into 8 different categories. These categories included Command, Control, Communications & Computers (C4); Intelligence, Surveillance & Reconnaissance (ISR); Cyber Security; Transportation Logistics; Power & Water; Crowdsourcing Tools & Analysis; Medical; and Development Support. In addition to these 21 experiments, a multitude of "ad hoc" experiments emerged as groups recognized complimenting skills and pushed technological boundaries through inter-organizational mash-ups. This emphasis on community learning and problem solving, rather than simple results oriented testing, continues to be one of the defining characteristics of RELIEF.

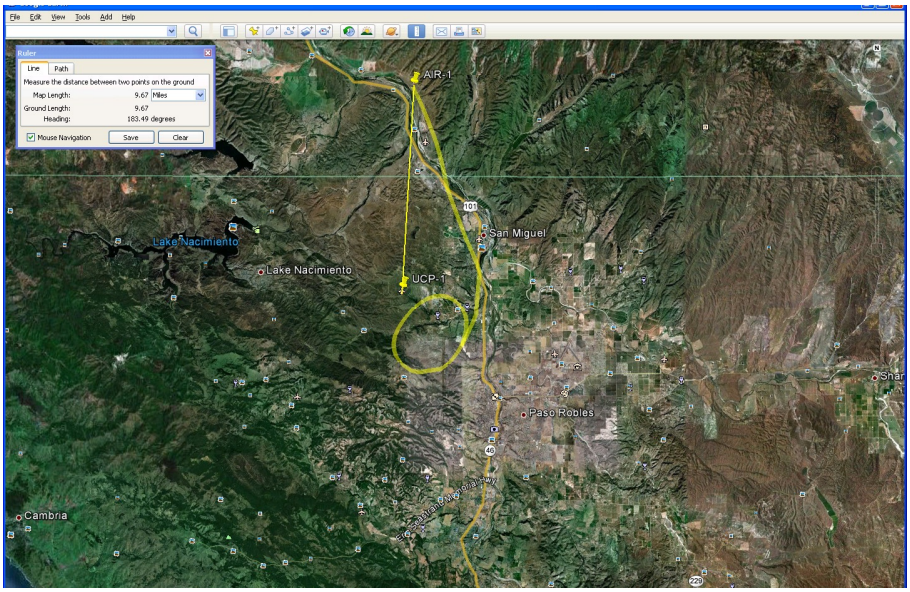
Our best metric of success is the change we help enable our participants to achieve: the processes developed during this event (see page 2) were fielded by Civil Air Patrol units in two states during the response to Hurricane Isaac. The proven success of RELIEF is a direct function of the community that has formed around the events. Please don't hesitate to email us with any stories from the field, inquires about the program, or comments on how we can better serve the community. Let's keep up the great work!

Regards,


Ray Buettner
Director, Field Experimentation
Naval Postgraduate School
rrbuettn@nps.edu

# RELIEF 12-4 EXPERIMENTATION RECAP

## Collecting Imagery that Matters




After a domestic disaster, the first imagery is usually collected by manned aircraft, but because flight crews are often given only basic collection plans, and because camera systems tend to lack the latest technology, the first imagery after a disaster is poorly integrated into the situational awareness of either the local EOC or national GIS desks. Recognizing this problem, a cooperative team came together this past August to address this problem. Present were representatives from the National Defense University, Civil Air Patrol (CAP), FEMA, National Geospatial-Intelligence Agency, GISCorps, the Humanitarian Openstreet Map Team, ESRI, and the Lockheed Martin Corporation. Together this team worked out a process that enabled FEMA, NGA, and CAP to rethink their concept of operations for collecting imagery in the first two days of a disaster response operation. CAP has traditionally collected thousands of high-resolution photographs from low altitude, each photograph covering a few hundred feet on either side. This method made it impractical for FEMA to stitch the photographs into a comprehensive map in the early hours of an emergency and often relegated CAP's imagery to use for specific (later) spot analysis. By convening the different parties who gather and use CAP imagery during and after a disaster, the group was able to developed a new CONOP for CAP imagery collection:


1. **Collection**: Sorties flown at higher altitudes that collect survey imagery covering more National Grids per photograph will enable rapid collection and processing of large areas, allowing FEMA to determine where CAP should collect high-resolution imagery of specific locations in subsequent sorties.
2. **Mapping**: CAP will integrate with FEMA's National Grid standard for its operations, gradually pulling it in line with the rest of the federal ICS structure.
3. **Crowdsourcing**: Imagery processing will be farmed out to a crowd, trained to identify the damage levels of different National Grid squares, allowing federal analysts to focus on locations which need the most help and accelerate allocation of federal resources to these areas. This process should also enable federal agencies to more accurately scope their operations, saving tax payer dollars.

*For more information please email John Crowley at bostoncello@gmail.com.*

# 12-4 Experiments

Communications Relay – Boeing ◆ Deployable Interoperable Infrastructure – Lockheed Martin ◆ Range Networks – Range Networks Inc ◆ Mutualink – Mutualink ◆ Portable Terminal with Exede Ka-Band Satellite Service – ViaSat ◆ Imagery Needs to Focus on Operational Risk Management (INFORM) – California State University Long Beach ◆ Cloud Based Solution for Situational Awareness and Analysis – ESRI ◆ Earthquake Emergency Response Exercise – Naval Postgraduate School ◆ EOC in a Box – Naval Postgraduate School ◆ Sensor Island – Naval Postgraduate School ◆ Rapid, High Spatial Resolution Image Assessment of Post-Earthquake Damage – San Diego State University ◆ Direct Imagery Tasking and Dissemination – Lockheed Martin ◆ Accelerating Imagery collection with Manned Aircraft – National Defense University / Civil Air Patrol / FEMA / National Weather Service ◆ Open Source HA/DR Software Security Evaluation – Rogue Genius ◆ Humanitarian Emergency Response Operations (HERO) Virtual Logistics – Strategic Mobility 21 ◆ Social Media Dashboard – EUCOM/ONR ◆ Crowdsourcing Flood and Damage Polygons – Humanitarian OpenstreetMap Team and GISCorps ◆ Real-Time Streams for Criticality Analysis – ESRI ◆ First Responder m-Health and Digital Exam Kit Field Testing – MedWeb ◆ Explosive Remnants of War Collection Points (ERW-CP) – Naval Postgraduate School ◆ Infrastructure as a System – Synergy Strike Force

# Integrated Earthquake Response


A large event in its own right, the Naval Postgraduate School's Remote Sensing Center organized a two day earthquake response exercise. The scenario simulated an earthquake of similar magnitude and location to the 22 December 2003 6.5 magnitude San Simeon earthquake that resulted in several deaths in Paso Robles and created widespread damage along the Central Coast of California. The earthquake's simulated effects included extensive building damage in the Camp Roberts cantonment area, as well as loss of power and communications. In response, a coalition of organizations from NPS including the Remote Sensing Center, Hastily Formed Networks Group, Virtualization and Cloud Computing Lab, and Center for Asymmetric Warfare were joined by San Diego State University, Terrapan Labs, NEOS Ltd, San Diego EMS, Monterey County EMS, and NOAA. Together this group performed a series of experiments around a common scenario including technology relating to remote sensing and imagery, geospatial data analysis, communication infrastructure and mobile operations centers.

*For more information, contact Scott Runyon at scrunyon@nps.edu.*

# Exploring Logistics in Humanitarian Operations

Analysis of the 2010 Haiti earthquake response efforts, and lessons learned when responding to other recent complex humanitarian disasters, have indicated that the lack of a knowledge management system impacts the international humanitarian community's initial response efforts. Seeking to explore a solution to this problem, a group comprised of members of Strategic Mobility 21, Virtual Agility, and California State University—Long Beach explored the utility of a virtual logistics tactical operations center for humanitarian emergency response operations. Operating out of the Technical Operations Center at the venue's airfield, the group tested interoperability with several industry and academic partners and were able to gather valuable data and refine their logistics tool. *For more information, contact Larry Mallon at lgmallon@vcweb.org*

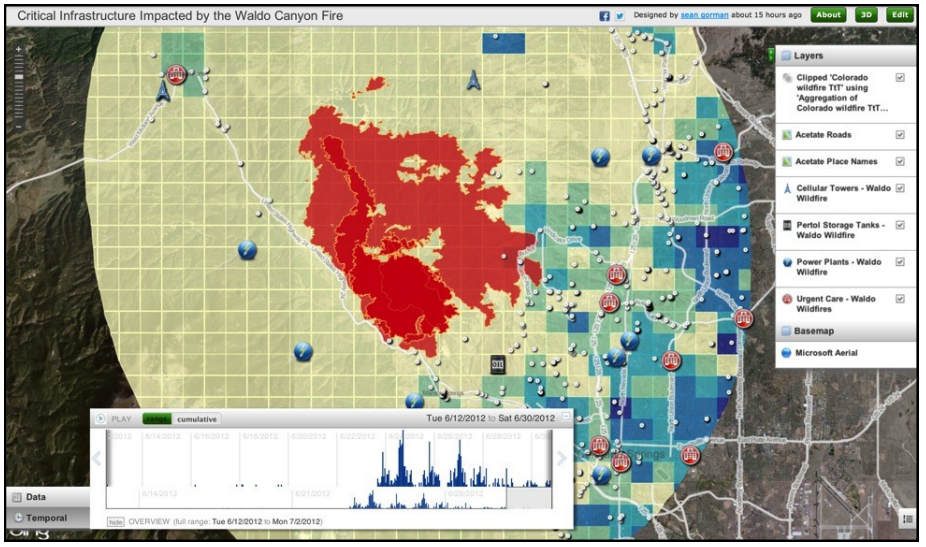
## JIFX Update

For the second time this year RELIEF was collocated with the Joint Interagency Field Exploration (JIFX) event. Addressing the needs of both Department of Defense and Department of Homeland Security, JIFX focuses on the problem sets of all nine DoD Combatant Commands (COCOMs) as well DHS, the Federal Emergency Management Agency (FEMA), United States Coast Guard, and United States Customs and Border Protection (CBP). The event provides a forum for science & technology innovation and interagency collaboration. In order to achieve this, JIFX first produces a quarterly Request for Information (RFI) detailing areas of interest to the DoD & DHS entities. JIFX then accepts research proposals written in response to this RFI from a wide array of actors including members of private industry, academia, government research labs, and non-profits. In addition to the benefits of working directly with DoD and DHS science and technology personnel, participants are also provided the opportunity to have their work reviewed by active duty military, Coast Guard, FEMA first responders, and CBP officers to help gauge the utility of the proposed technology at its formative stages of development. We look forward to future collocations between RELIEF and JIFX that will provide increased sharing of ideas and resources. *For more information on JIFX, please email Tristan Allen at jifx@nps.edu.*

Check out the September episode of "Inside NPS" which highlights the activities at JIFX 12-4:

**Inside NPS**

# Real-time Analytics of Social Media Streams

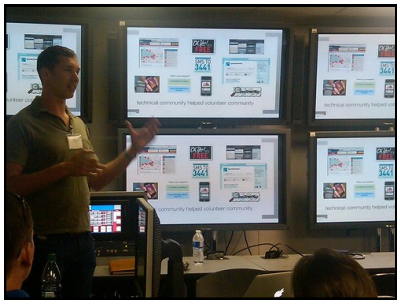



ESRI returned to RELIEF this August with a tool for analyzing mobile and social streams to explore creating a dynamic pulse of human activity and patterns during a disaster. The team was provided 250,000 Tweets from Catherine Starbird of Tweak-the-Tweet that covered the Colorado Wildfires of summer 2012. The experiment endeavored to discover how viable the social media data from Twitter was as a source of disaster information. The quantitative analysis of the data uncovered several challenges and also many potential benefits of leveraging social media in general and Twitter specifically. *For more information, contact Sean Gorman at sean@geoiq.com.*

# Drones for Peace

Providing an informative lunch brief on Thursday, James Peverill of Rotary Robotics presented his company's latest project: An ultra low cost aircraft intended to bring aerial surveillance capabilities to disaster zones. By integrating the camera & autopilot, and by creating a system for smartphone control, Rotary Robotics is hoping to provide a aerial reconnaissance capability to the cash-strained humanitarian community and perhaps even the affected population themselves. *For more information, contact James Peverill at james@rotaryrobotics.com.*

# Social Media Dashboard



Funded through the Office of Naval Research, the United States European Command's (EUCOM) Social Media Dashboard tool includes TweetXplorer, a state of the art ONR project to gather social media information specifically for crisis (capable of handling flows of 100,000 messages per hour); improved crisis map capability (robust even under Internet Explorer 7.0); automated message sorting with language filters; trending on any word; and community detection algorithms. EUCOM teamed with Arizona State and interfaced with a variety of participants and test their system with a broader audience.

*For more information, email Adam Clampitt at adam.clampitt@thedc-group.com.*

Visit www.npsrelief.org to

view the 12-4 event **Quick Look Report**

# Update on Returning Projects

**Range Networks** was out with a couple of different toys. In addition to their deployable GSM cellular network, the group partnered with QinetiQ North America to deploy a ground robot over their GSM network, creating greater control standoff distances and increasing the robots range and on-board processing and storage. *For more information, email Jeff Stern at jeff.stern@rangenetworks.com.*

**Mutualink** brought back their secure, peer to peer command and control node to test its viability and applicability to the Defense Support to Civil Authorities context. *For more information, please email Steve Scott at sscott@mutualink.net.*

**Medweb** returned for further testing on their mobile-based patient registration system and field deployable digital exam kit designed to equip emergency first responders with medical devices and associated patient image/ data transmission capability. Additionally, the MedWeb team continued its work relating to the development of an integrated hardware and software platform providing a cross-domain Common Medical Operating Picture for civilian and military decision makers. *For more information, email Peter Killcommons at pete@medweb.com.*

**Lockheed Martin** attended with several of their systems to explore communications interoperability and support imagery processing for several experiment threads. From patching through communications between EMS personnel on both cell phones and radios to disseminating video and sensor data between pilots and ground personnel, Lockheed reinforced its reputation at JIFX of a outstanding collaborator! *For more information, contact Russ Chan at russ.chan@lmco.com.*

**Boeing** returned this August with their Aerial Communications repeater. Flown on both the Puma and Scan Eagle UAVs, the comms repeater provides increased range on a wide array of different radio and cellular communications over varied terrain. *For more information, contact Richard Paquette at Richard.g.paquette@boeing.com.*

# What's Next...

## RELIEF 13-1 & JIFX/RELIEF 13-2

RELIEF (13-1) will return this October for a limited, invite only event focused on cyber security during humanitarian assistance & disaster response operations.

Stay tuned to our website for information relating to the 13-2 combined JIFX/RELIEF event planned tentatively for February 2013 at Camp Roberts, CA.