Civil Air Patrol Disaster Imagery Workflow

After a domestic earthquake or flood, the first imagery available is often collected by the Civil Air Patrol (CAP). Before collecting spot imagery of specific buildings and infrastructure, FEMA requires survey imagery from higher altitudes to scope the federal "push" of resources. This CONOP details the basic sketch process for planning which areas of interest (AOIs) CAP should survey first, as well as the collection, transmission, processing, and analysis of that imagery. The process is meant to create a learning loop, so that CAP would be tasked with new collections based on their survey imagery. The loop is meant to be entrained with the usual 12-hour rotation of a flight crew.

Background: This workflow was developed in conjunction with CAP HQ, CAP CA, FEMA, NGA, GISCorps, ESRI, Lockheed Martin, Humanitarian OpenStreetMap Team, OpenAerialMap, NDU, and NORTHCOM at the NPS JIFX 12-04 (Aug 2012) at Camp Roberts.

Planning

First Responders
Initial EOC reports

Hazard Maps/Models
Shakemaps, fire, flood

Infrastructure Maps
HSIP, DHS, NORTHCOM

Social Media
Tweak the Tweet

Population Data
LANDSAT, Census

Collection Plan
List of AOIs for CAP collections and flight routes/grid assigments. Work to build cross-correlation of data to identify hot spots where collections are most critical. This map could become dynamic and reflect responder reports and social media.

Collection

Preflight Brief
Baseline collection plan #1

CAP 1

CAP 2+

Sortie 1
National grid square assignments A. Optimum survey collection at 10K AGL @ 30mm with FOV at approximately 3km by 2km. Lower Altitudes change focal length to get equivalent FOV. Possible lower level collections for subsequent taskings.

Sorties 2 and greater (scale for additional aircraft)
National grid square assignments A. Optimum survey collection at 10K AGL @ 30mm with FOV at approximately 3km by 2km. Lower Altitudes change focal length to get equivalent FOV. Possible lower level collections for subsequent taskings.

Processing

Ground Station
Get data from cameras

Tramission
Requirement for faster speeds

Live Data Feed

Tramission
To explore real-time transfers

FEMA Portal
Upload imagery to FEMA portal

Mosaic Imagery
Build map of damage

Analysis

FEMA FCO Brief
Analyze damage with FEMA federal coordinating office (FCO).

Develop Shot List
Plan for low-level flights of specific areas of interest.

0   +0.5   +1.0   +1.5   +2.0   +2.5   +3.0   +3.5   +4.0   +4.5   +5.0   +5.5   +6.0   +6.5   +7.0   +7.5   +8.0   +8.5   +9.0   +9.5   +10.0

v 0.1