

ASPRS WORKSHOP - May 2, 2006
The Role of Airborne and Satellite Imagery in Disaster
Lessons Learned – Follow on Working Session

PRE PROGRAM – REVIEW DISCUSSIONS

FEMA/COE Blue Roof requirements drove acquisition, areas inundated with water but not experiencing roof damage did not get coverage or covered as often.

There is a need to develop a way to add other agency requirements to FEMA/COE flight tasking.

Funding is usually not available to do post disaster response “cleanup” (e.g. archiving, adding metadata).

Declaration of disaster usually triggers special funding...there is a need to have funding made available up front for pre-staging of data, planning, and training.

Much of the data was “perishable” due to changes in water levels, by the time processing, compression, etc. were done the data was not as useful anymore.

NGA PRESENTATION – Peter Paquette

Crosswalk discussions were held with the Federal Civil community in April on “Lessons Learned”.

“Way Forward” – NGA to provide 8 bit pan sharpened GEOTIFF to customers, requested at the same time as 16 bit NITF (raw image). Orthorectified image to be provided ASAP after delivery of raw image.

NGA Outreach – When and Where?

Civil community contacted in January via email, follow-ups included on-site training briefings and conference calls with Federal Civil agencies involved in disaster response.

Federal only to date, no direct state and local direct outreach yet.

Suggestion – contact local USDA extension service; they have representation at County level, a bridge from Feds to Local.

There is also the potential to use USGS State liaisons as well.

ACTION – Coordinate USDA with NGA – Bethel is lead for USDA

Bethel – outreach needs to be based on states or regions, not by agencies

Coordination between NGA and state leadership of National Guards also needs to be improved....POC for National Guard?

“Way Forward” – NGA working to provide streaming and chipping ability, increasing bandwidth on both ends.

No final recommendation on GBS (Global Broadcast System) – probable replacement for SkyMedia

USGS - High bandwidth and improvements by NGA does not help the end user on the ground at disaster site.

USGS and local requirements were not addressed until after the 82nd Airborne came in, their requirements seemed to get attention....which addressed many needs of other Federal Civil and local users.

****Need to have users ask for what they want (e.g. bridge is out) as opposed to large datasets that have more than they actually need....question is how to service these requirements properly, locals knowing what they want vs. NGA/Federal agencies trying to make that determination for the customer**

NOAA – satellite imagery was not as useful due to cloud cover, airborne platforms need to be considered more often when evaluating requirements.

PRIVATE SECTOR PRESENTATIONS

Sanborn (Roger Crystal)

Sanborn – was contacted via USGS Cartographic Services Contract (CSC2) representative to provide imagery and mapping services for Katrina support, later stood down and no actual imagery or lidar flown via the CSC2 for 2005 hurricane season.

Later (December 2005) tasked by CSC2 to provide Lidar and imagery for Tom Sauk dam failure (earthen dam in MO). Twenty-four hour turn-around provided.

Recommendation – setup a primary “Incident Command Center” that coordinates data acquisition and routing/dissemination

Earth Data International (Anne Miglarese)

EDI did not fly Katrina/Rita imagery, although they orthorectified and performed interpretation on 3001 sourced imagery (ADS/40).

Data processing center needs to be located as close as possible to the actual disaster center (given need for power and internet connectivity). Much of post Katrina data was processed in Frederick, MD.

Many Federal agencies were calling EDI asking for the same data over the same area.

FAA approval process for access to airspace over natural disasters is a HUGE problem....often closed by FAA to limit speculative flyovers.

Unclear mandates – who is responsible for geospatial data for natural disasters? FEMA? NGA? USGS? USACOE?

“Like politics, all disasters are local” – Locals should set requirements.

\$12 million in new budget for NOAA for aircraft/sensors for disaster response.

Pre-Negotiated disaster response contracts are needed ASAP....already in place in FL with EDI.

Mobile Pixel factory (New EDI Hardware/Software system) has been developed and can process digital camera data from all current mapping quality systems (DSS, ADS/40, DMC, UltraCam)

3001, Inc. (Jeremy Connor)

3001 Contract with St. Louis COE was an IDT contract, not originally intended to be for disaster response

3001 could not use their DMC's because processing facility for DMC workflow was located in New Orleans.

Seven copies of each ADS//40 dataset were made, 3001 spent over \$30k on Firewire drives alone.

Presidential visits to gulf area restricted (canceled) flights on two occasions.

Some problems with flying Learjets (for speed) and ADS//40 – was good for 1:400 products but not for 1:200 products.

FAA flight restrictions not a major problem in Rita response (see comment on Presidential visit disruption above).

Less of a requirement for coverage updates with Rita, since flood waters receded and there was no need for flood monitoring, just damage assessment imagery

There is a need for an assessment/inventory of the types of maps that were most requested and used (some of this has been done).

24 hour turnaround – around 12 hours was transfer of data, moving Firewires via plane or driving them to deliver....only 12 hours were used for capture and processing.

**Bethel – suggestion to use DOD broadcast system to distribute to FEMA and USCOE, rather than have contractors supply data directly to FEMA and USCOE
USDA role is more recovery, not direct response**

3001 did not fly for Wilma because IDT contract funds had been used for Katrina and Rita response.

Metadata was on original Firewires, project level only....often not distributed to others on new Firewires. Indexes and flight lines were like the Metadata...on original drives but often did not make it onto distributed drives.

September data from Katrina is still being used, for determinations of Federal assistance....still some value for the data.

Pictometry – (Brian Beha)

Pictometry works disaster response directly through counties or locals, rather than FEMA/USCOE. They often provide this support for existing county/city clients that have previously purchased Pictometry (non-disaster) coverage.

Pictometry had a lot of problems with FAA flight restrictions (especially since their platform flies much lower – 2,000 ft. is typical than other airborne systems)

Pictometry impacted by Presidential visits FIVE Times, airspace was controlled by AWACS (military airborne controllers), NOT the FAA

Some issues with range and logistics (no places to land) since Pictometry uses smaller aircraft.

Archiving of data and data backup needs more consideration....often customer backups and their main datasets get destroyed during a disaster....there is a need to make sure old datasets are still available.

**?What happens if local first responders are no longer available?
(Most Federal assistance is focused on supporting first responders)**

Recommendation – establish ground stations and control in disaster areas to support mapping/georeferencing of imagery/lidar/radar, etc.

Applanix (Drew Fisher)

Multi-sensor collections becoming more commonplace.

Emergency response now means less than 24 hours.

“Vendors can’t do it all”, end user could do some post processing or at least define requirements for later products produced by vendors...it is very difficult to make products on short timeline with appropriate QA or post processing.

Data workflow a bigger issue than data collections (e.g. Mosaicing and tonal balancing use the most processing time).

DSS more suited for site specific damage assessment, not wide area coverage...use large format cameras or satellite to meet those needs.

Consolidation of responsibility into a field operations center makes it much easier on vendors, helps to define responsibilities and lines of authority.

FEDERAL AGENCY UPDATES

Bethel (FSA)

**USDA is creating county block packages of Katrina ADS/40 datasets
USDA flew some National Forests in TX**

Crowe (USGS - HQ)

Federal agencies should publish planned imagery acquisitions into GOS2. New DHS and NGA requirements, along with state and local partner data to be input into GOS2. A significant amount of public domain imagery will be acquired during the next year. This is a combination of off the shelf 2005 imagery, new 2006 imagery and some planned 2007 imagery acquisitions

Brenda Jones (USGS – EROS)

Working to improve data delivery capabilities, new system being installed now that does automatic formatting/projection/metadata and KML file compilation to support disaster response. There is a draft document coming out next week for public comments on formats, naming conventions, metadata. This will be reviewed by the remote sensing data call group.

New Delivery system – FTP and seamless systems – looking to have various levels of user definition, from shape files and vectors, to large raster datasets

Looking at alternate contracting vehicles within USGS (other than CSC2) to enable rapid response contracting. Will try to use new USGS Geospatial Products and Services Contract (GPSC) contract for disaster response. (rapid response contracting capabilities will be incorporated into the GPSC)

NGA – Has developed a standard file-naming convention – 80 characters with the first 40 characters already defined. Action: for NGA to send this information to Brenda to be considered by the remote sensing working group.

NOAA

Planning on improvements to onboard systems to enable rapid indexing and georeferencing of imagery (ready to distribute coming off the aircraft), have improved NOAA website. Will publish planned flight line indexes of potential areas of coastal imagery

BREAKOUT SESSIONS

LOGISTICAL ISSUES

There is an incident command system (ICS); however, training is needed to let end users know how to interact with ICS's. (E.g. National Response Plan, NIMS, ICS)

Assets are available, need to use existing ICS systems...plans are in place but often not used or followed.

National mock drills could be useful to exercise and improve existing ICS's. Also need to train on packaging and extraction of data for use by end users....don't wait until disaster occurs to learn how to respond to the disaster.

There was a question about whether or not geospatial issues and concerns are adequately addressed by current ICS's.

Bethel – need to acquire imagery outside the coastal zones....many inland areas are impacted but coastal zones get flown multiple times. Need to define an approval process for other than urban and coastal areas that ensures all areas impacted by a disaster get covered. Threshold for official disaster imagery (loss of property, loss of life, urban areas impacted) does not align with USDA needs.

Need to package data and get it available to the county office level, having it stored at and distributed on demand from EROS does not meet the local county/USDA needs

NGA –is there a need to distinguish between satellite and airborne imagery? YES

Best airborne data exists at the county, but may not be available during a disaster, or for pre-disaster use, it is licensed or tightly controlled and not available

Need to update the FEMA/DHS Remote Sensing in Federal Disaster Operations Standard Operating Procedures plan (it was originally developed in 1999...long before high res orthoimagery was widely available, high res satellite, before creation of DHS, etc.) – define integration of this plan with the NIMS plan

Crowe – ASPRS recommendations on updates to response plans to DHS will be considered seriously, ASPRS speaks for the entire community...Federal, State, Locals, data providers, etc.

Bethel – Need to have a requirements collections process, with business/technical rules to determine area of interest and technical specifications...don't just have “3 people in a room drawing polygons”

Need to have updated points of contact in ICS/Response plans (e.g. FEMA plan lists contacts from 7 years ago)

NGA – Commercial Satellite Imagery funding – a portion is set aside (as an emergency fund) for disaster response, pre- and post- event; note that this is for commercial satellite image data only. Source Operations and Management group within NGA determines AOI, based on input from DHS/FEMA.

NGA – existing or tasked airborne imagery is probably the best source for PRE-EVENT disaster imagery.

Data cleanup after initial acquisition – should scope of contracts include further processing/cleanup after 24 hour needs are met? There is a tradeoff of more value added processing to data vs. using that contract funding to cover larger areas.

Pictometry – getting ready to announce publicly that any area (counties usually) that is a current customer will get free new overflights of any federally declared disaster area(s) within their area

States/counties/cities that create datasets should consider offering copies to Federal sector (e.g. EROS) in case their data is lost in an event

Many private companies have substantial inventories within their archives of pre-existing data; these collections can provide a pre-event dataset

TECHNICAL ISSUES

Remote Sensing working group is working on a draft document that addresses various format issues (projections, data formats, tile shapes and sizes, etc.). Action to Craun to distribute this draft document to participants in this session for additional review. There was some question about the need to control this document since it contains requirements (possible procurement issue?).

Procurements for airborne data should specify ability to get 12 bit (or higher) data at a different/later time even if original delivery is in 8 bit (Handley)

Commercial satellite Imagery requirements determined through NGA “lessons learned” crosswalk

Phased metadata collection could be used to meet immediate needs with “light” metadata, later on add additional metadata to further define dataset. Reference NGA defined Image ID or file name as a possible initial minimum requirement

Remote sensing working group will send out their document for comment; more complete metadata should be planned and ideally funded with the acquisition.

Emergency response functions can be used to define technical requirements....but geospatial requirements are not currently part of the National Response Plan

It is very useful to use/consult point target/vector/HSIP datasets to determine imagery technical requirements (e.g. specs, Areas of Interest), rather than fly imagery and then use vector data with that imagery...reduces amount of imagery that is just flown and not used)

Hard Copy maps – it is useful to have staged and available hard copy maps ahead of time, included in a list of pre-defined products. What about specs/standards for hard copy maps? Define minimal level of specification for hard copy maps?

Capture some “best of” SOP’s for production of hard copy products....make available to potential locals that might need to make these products in a post disaster environment

Grids – USCOE wanted UTM, helicopters and boat crews wanted coordinates. Dual grid maps were printed but not preferred. Decimal degrees vs. degrees/minutes/seconds were also a problem for some users. CLEAR LABELING on a hard copy map is essential.

USGS to print full line UTM grid and National Grid markings on USGS hard copies.

Jump/thumb drives were used extensively for vector data sets, Firewires generally preferred for imagery datasets.

NEXT STEPS

Notes from meeting compiled, list of recommendations will be sent out to meeting attendees. A report will be generated from the meeting notes and post meeting comments.