

National Digital Orthophoto Program (NDOP) Meeting
October 6-8, 2008
Meeting Minutes

Meeting Location:

NOAA
NIST, Building 1, Rooms 1103/05
325 Broadway, Boulder, CO 80305

Agenda Topics (Topic, Name, Estimated Time/Day)

Monday, October 6th

Field Trip:

- 1) Digital Globe (Longmont) – 9:00 -10:30am – Brett Thomassie
 - 2) Rocky Mountain National Park (Estes Park). – 12:30-1:30 Mike Story/Ron Thomas
-

Tuesday, October 7th

Welcome/Introductions/Logistics, Jerry Harlow/Tony Kimmet, USDA-NRCS
Agenda/Wednesday Afternoon Tour Information, Tony Kimmet

Thanks to Janet Brown (NOAA) for helping Tony to organize this meeting.

Introductions

Denver Area High Resolution Orthoimagery and DEM Support for Democratic National Convention - Denver Regional Council of Government, Paul Gibb, Sara Eberhardt and Mark Eaton

DRAPP '08 Denver Regional Aerial Photography Project, Paul Gibb

- Before 2000, most public agencies acquired their own imagery as needed
- In 2000 Transit partnered with other agencies to acquire imagery
- 2004 - Denver acquired LIDAR and orthos
- Map of acquisition areas – see presentation
- Data provided in different projections
- Project works to share costs and build a regional basemap
- DRCOG members based on cost formula, Underwriters (regional and state governments, utilities such as Denver Water), Federal government. Other non-members charged based on area of coverage such as water/sewer and E911 districts.
- Partnership strategies:
 - Leverage investments in control points, DEM/DTM, last year's imagery QA/QC
 - Provide a service for members
 - Improve collaboration among agencies – good partnership with Feds

- Improve accuracy of base map
- Project doubled in '06 - \$1.1 million, 6-inch in urban areas, 40+ partner members
- Provided interim product to stakeholders for Democratic National Convention within 60 days of acquisition
- Continue to improve regional base map
- Show value of regional collaboration
- Future Efforts
 - LIDAR/Ortho combination
 - Yearly acquisition in parts of region
 - Higher resolutions – potentially 3-inch
 - Satellite imagery
 - More state and Federal opportunities to partner
- Regional Data Summit – Thursday November 13, 2008 – DRCOG –
- www.drcog.org/drapp

Questions/Comments:

Are web map services available? Yes – in development – consortium has two year access, may have subscription to others in future once it is fully operational

Will there be an announcement for summit? Will be at Denver Regional Council of Governments, downtown Denver, will be sent on to Mark and posted.

Action: Mark Eaton will post the announcement for the Regional Data Summit

DNC Project, Mark Eaton

- Footprints of LIDAR and imagery – see presentation
- Delivery to NGA
- LIDAR through GPSC (USGS) contract
- 1.3 meter LIDAR request from NGA
- Local partners wanted FEMA 2-foot contours therefore needed .7 meter LIDAR
- Partners – NGA (covered their areas plus the holes), surrounding cities, Denver International Airport, National Guard
- Will be public domain
- Issues: short timeline; local funds require flexibility; how to determine cost model (used ESRI Union tool based on cost per square mile)
- 9 joint funding agreements finally settled
- Slides of 2-foot contours, bare earth return, 6-inch imagery, 3-D model – see presentation

Question/Comments:

Would partners have dropped out if NGA did not cover the costs for the missing areas? Yes, very likely

Comment: Boston ran into trouble with working out agreements. The Denver project is an example of how well it can work.

NGA is very happy with what they have received. Traditionally, they have not partnered for LIDAR. This was a new format, but was a great learning experience. They recognized the cost savings using partnerships.

What about areas covered that did not contribute? They will receive it as public domain and will have to wait for the product.

Sanborn (Vendor Presentation), Jason Caldwell

- Overview:
 - Sanborn is owned by DMG Information. Sanborn has 3,500 employees and was started in 1866
 - Data Acquisition:
 - emergency services (within 24 hours)
 - Photogrammetry
 - Data Conversion – utilities, cadastral
 - GIS – consulting
 - Decision Support
 - Imagery Analysis
- Data Acquisition Resources: ultraCam, Z/I DMC, and Leica digital cameras, 9 fixed wing aircraft
- Experience: Federal government – extensive contracts
- Forest Service Contracts
 - Colorado, Boise and Payette Idaho
 - Issues: terrain relief causes need to break flight lines, meant 50% additional exposures were collected; how shall data be delivered – USFS wanted 12-bit data; data management – 32-terabytes of data delivered
- NAIP Experiences
 - Virginia – 4-band collection; absolute control – AGPS/IMU and existing ground control (provided by APFO); seamline shapefile required
 - Issues: color balancing – they have worked out a color balancing process flow to make image consistent – internal proprietary software
 - Source for elevation data – NED; also completed DEMs for certain areas, VA has the data (is it in public domain?)
- Vegetation Mapping with MultiSpectral Imagery; Ecological Systems Classification– slides show examples – see presentation. Other projects: impervious surface extractions; City Green projects
- DEM's for Denver
 - About 1000 square miles; High Density LIDAR; 2-foot contours; intensity GeoTIFFs were also delivered (can use for brakeline extraction)
 - LIDAR: National Research Council of the National Academies document highlights – great source of information for LIDAR
 - 10 centimeter vertical accuracy RMSE
 - Automatic filtering and classification – can show small changes in elevation
- Applications:
 - Change detection – urban planning, vegetation mapping
 - Vegetation mapping – derive vector and raster polygons for vegetation canopy – first return data
 - Building extraction – looks different from digitizing building footprints – slight waviness, but quick and easy
 - Solar application: slope and aspect – determine best spot for solar architecture (especially in CA, OR, WA)
- Derived data products – understanding connection to management processes
- Examples: Forest Habitat Mapping – mitigating invasive species
 - Taum Sauk Reservoir – dam breach
 - CityViz – siege plan for Denver – Common Operating Picture -

Questions/Comments:

Is CityViz a product offering? Yes – integration software, adapts to ESRI

What about simultaneous collection of LIDAR and imagery – they currently do not collect simultaneously. They would have to fly more imagery but there are scheduling issues. Currently they fly most LIDAR at night and are considering simultaneous collection in future.

GeoMAC- Wildland Fire Support, Elizabeth Lile – USGS-RMMC

- Strategic level geographic info for public access: Fire support and NHSS (Natural Hazards Support System)
- Multi-agency coordination committee – 2000 – need for locational information for fires
- Where is the fire? Where is it going?
- Integrate multi-data sources – post to FTP site – data from NOAA, RSAC, BLM, USGS, Fire Perimeter field offices, NIFC, NASA
- Acres burned 2002-2008 – see presentation
- Hyperlink to reports on each fire, weather information
- Integrate to remotely sensed data – MODIS
- Fire History – wildfire viewer, categorized by cause
- Tactical Level Geospatial Information – Rapid Data Delivery System (RDDS) – restricted access
 - Earthwhere created
- Raster Data Management – ArcSDE Database – choose area – imagery, raster map, vector data – bring into ArcMAP
- NAIP imagery is used in system – data loaded for the West only at the moment
- Status maps of available data – see presentation
- Future datasets, BLM 100K maps, updated NAIP
- Rapid Assessment of Values at Risk (RAVAR) – evaluates chance that fire will reach a given area
- Have been collecting structures – example: structures that were not burned after fire – 74,719 structure points collected – see map in presentation
- www.geomac.gov

Questions/Comments:

Is data compressed? Size is limited, have to pull out in pieces, but then it is seamless

Creating DEMs of Coastal Areas Using Satellite Imagery, Barry Eakins and Lisa Taylor, NOAA

- Tsunami Inundation Gridding Project
 - Began in 2006 – model Tsunami wave using ocean floor bathymetric information
 - Need seamless DEM at coast to complement bathymetry
 - www.ngdc.noaa.gov/mgg/inundation
 - reports and metadata describing DEM creation: methodology, etc.
- Put into Mean High Water Datum
- DEM needs to represent bare earth
- ESRI ASCII raster format
- Used for modeling events today, but tested by modeling historic tsunami events
- 1/3 arc second – 10 meters
- DEM discovery portal www.ndgc.noaa.gov

- Example: Katama Bay, Martha's Vineyard – breach in sand bar. This feature was not represented in any existing data, they needed to develop new coastline vectors.
- Wanted to look at new depths in bay – compared image (from Satellite image) values to depths, does not work for deeper water – only up to about 5 meters
- Other areas around Nantucket and Cape Cod

Questions/Comments:

Are you using imagery from the Coastal imagery group (ERRL) No – would like bathymetric LIDAR for this project

Using Ikonos Orthoimagery to Detect Coral Bleaching, Chris Elvidge, NOAA

- Increasing frequency of bleaching events – coral expels the algae when stressed, usually by heat – when this happens over and over the coral dies and breaks apart
- Coral Reef Watch (CRW) program in NOAA includes monitoring sea surface temperatures
- Now using satellite imagery for this project
- Study site – Great Barrier Reef – looking at image before, during, and after event
 - Radiometric normalization looking at changes in actual scenes rather than in technology
 - At first was simply visual interpretation
 - Now have an automated approach - Index
- Found mid-twentieth century imagery in NOAA holdings including large format b/w films from 9 lens camera
- National Geodetic Survey – where these images originated – original has been discarded, these were second generation films and prints – best record of mid-twentieth century data for shoreline data so film will be scanned and catalogued

Questions/Comments:

Do you use IR? Yes, we use IR for wave pattern areas, but not smooth surface areas. We subtract each spectral band from it's counterpart to define the areas of bleaching.

What is this imagery? IKONOS

Is rescued imagery available for Alaska? Yes, much of it is from Alaska

USDA-NRCS Local Presentations

National Elevation Dataset with Geospatial Data Derived from Current Orthoimagery,

Travis Rome - Kansas

- Traditionally used USGS 7.5 minute quad maps
- Mid 1990's - digital ortho photography became best choice for base maps
- Had to first revise the NHD data, then soils
- Prefer leaf-off imagery
- CIR False Color Composite - useful for range management, invasive species
- Used 10-meter NED data, but old
- 2006 - Kansas acquired over 5 counties of LIDAR data – great for hydro delineation
- Commodity prices will drive the need for imagery
- Soils data dependent upon slope – LIDAR very useful for this product – need to fix errors from old data sources
- Hazard classifications for NRCS funded watershed dams – breach analysis

- HEC RAS Model – hydro, TIN, current imagery
- Kansas future imagery needs:
 - Height modernization project – CORS every 50 kilometers within state
 - Team of stakeholders in Kansas trying to define needs – 20 counties buying it separately each year. Need to work together for economies of scale

Use of NAIP CIR for Invasive Species Detection, Shandy Bittle, Nebraska

- Red Cedar encroachment in central Nebraska
- Created an add-on product with NAIP in 2006
- Brush management practices – study area in central Nebraska
- Red Cedar is invasive
- In past – eyeball estimates in the field – very inaccurate
- Satellite Interpretation – Thematic Mapper imagery – 30 meter resolution
 - Created a canopy cover map from the imagery based on categories (10-30%, 30-70% and above 70%)
- Aerial imagery –
 - Used a shape/texture classifier to create map
- Comparison of satellite and orthoimagery
 - Satellite more coarse
 - Orthoimagery more detailed, error is lower
- Discussion Points:
 - Payment levels to remove trees: slope an issue; by density or canopy density
- Would like to tie this project with the Nebraska LIDAR project
- Used Definiens software

Question/Comments:

Was initial analysis on Natural Color imagery? Yes but, was run again with CIR. Natural color is good for feature extraction. It would be interesting to compare. A four-band would be interesting to see. Band combinations make a difference. This can be varied to optimize band tool.

NAIP/NAPP Web Map Services for Agency Programs, Randy Wiggins, Wyoming

- Challenge – how do we provision our field offices with imagery?
- Applications
 - Add Internet Data – 2003 – data from APFO, runs off of a text file
 - Equipment Prioritization System – 2004 – ArcIMS – data from Ft. Worth – prioritizes the data sets based on selection of issue
 - CARL – 2006 – Cultural Assessment Resource Locator – Decision support system - NAIP from APFO as well as vector data from other sources – user digitizes area
 - WIRL – 2007 – Wildlife Inventory Resource Locator – NAIP from APFO and other datasets from other web mapping services – project area (digitize or upload) – will show endangered species in area
 - SuiteWater – 2009 – imagery and LIDAR web mapping services, field engineering data – geo-hydro engineering tools for reservoir creation, pipeline design, etc.
 - Trying to find ways to distribute and use LIDAR for these projects
- Concerns and opportunities:
 - Users want high-speed access to quality imagery

- WMS imagery needs to print at higher resolution – is this function of mapping software or of imagery? Web mapping service just deals with a representation of the data. Users need to be able to grab the real data.

Action: Should this be put into analysis for IFTN Hosting and Archiving Subcommittee?

- Users want analytical tools and derivatives from raster data

Questions/Comments:

Is CARL internal to NRCS? Yes – rigorous process to get access to server

Do you still use ArcIMS? No, we have migrated to ArcMAP

Alaska Themes

Use of High-Resolution Orthoimagery for Coastal Erosion Studies in Alaska,

Use of Historical Imagery, William Manley – University of Colorado

- Rapid, observable change to environment, impact on habitats
- Time series orthoimagery
- Study area - Northwestern Alaska – Bering Land Bridge NP – 550 Kilometers of coastline
- Kivalina – sued oil companies for global warming
- Field research
- High-resolution base imagery 2003 mosaic, 1980 1-meter resolution and 1950 photography
- 2003 - .6 meter res – 1.1m RMSE accuracy –
- Data is available and used for ecosystem research and other uses
- <http://Alaskamapped.org>
- Shoreline Reference Feature (SRF) – bluff top
- USGS extension to ArcGIS – shore system analysis – able to measure erosion in GIS, then compare to field measurements
- Is coastal erosion increasing with Arctic warming? A lot of spatial variability – need higher temporal resolution to investigate further
- Conclusions:
 - GIS – low errors
 - Most coastlines are eroding
 - Need better spatial and temporal resolution
- Perspectives for NDOP
 - High resolution orthoimagery and DEM's are extremely valuable for environmental research
 - Data sharing is undervalued in academia
 - Distribution is a challenge: alaskamaped.org is a great resource
 - Imagery and DEMs in Alaska is of poor quality
 - Expensive and time consuming to create piecemeal
- Comparison: Niwot Ridge, CO within a week found four time periods of good data to compare

Questions/Comments:

Is a particular resolution best for coastal erosion? 1-meter or better is best – for temporal

What about bands? Four-band would be great.

Was there any data from local population? They did not pursue this. Maps are not high enough quality. Might be appropriate for a qualitative evaluation.

What is the National Park Service Program Inventory and Monitoring Program? This is a series of four Alaska networks that establish a baseline for habitats.

Film Library in Support of Change Detection at APFO and USGS, Update,
Doug Binnie USDA, EROS

- Landsat Web Enabled Data
 - Began in June 2007 as a pilot project; Landsat 7 data only
 - Now there are plans to release all Landsat data by the end of the year
 - L7 – Sept 30, 2008
 - L5TM, L4 TM, L1-5 MSS: Dec 31, 2008
 - If not yet processed, then it will be processed on demand
 - Pixel size of 15m and 30m
 - Download only

- Digital Data Delivery of Analog Products
 - 59,000 rolls of film
 - Discontinued photo lab in 2004 – digital products only
 - Digitize 8.6 million frames – on demand for high resolution scanning with a fee
 - The indexes are for imagery that have not been tagged with lat/long (1940-1960)
 - Created special digitizers (Phoenix IV)
 - Kodak 13.9 mega-pixel – medium resolution of film
 - Captures slightly larger than image, then clips the edges so no part of image is lost
 - Many oblique images have not been identified before and are not being made available
 - Phoenix V Prototype – better light source, improved resolution (although not photogrammetric quality – more of a scanner)
 - EarthExplorer – metadata search tool – printout of images in area of interest – click link and download – can overlay into Google Earth – need to register to download
 - Over 6 million frames already digitized
 - Access is easier
 - Downloaded data is 6-8 meter resolution, can request data to be specially digitized for 1-meter resolution

Questions/Comments:

Is camera calibration part of metadata? It is probably not in metadata file, but there is camera information.

Kent Williams, USDA, FSA

- USDA Historical Aerial Photography
 - Slide dates of orthos for each county – see presentation
 - About 9 million negatives – collected since the 1930s
 - 1955-1970 – 1:20,000 aerial photos
 - 1970-1982 – 1:40,000
 - NHAP 1982 –
 - 1982-2003 – NAPP
 - 2003-2008 – NAIP
 - Photo Index Scanning Project – mosaic
 - Capturing footprint of each exposure – shapefile with metadata
 - www.apfo.usda.gov indexing not yet up
 - Call customer service: 801.844.2922
 - Have had some requests, but it is not advertised because it is time intensive

Questions/Comments:

USGS Air Photo Record System: does this still exist? No

APFO has no plans to scan this imagery. They scan by request and charge a fee.

AGDC/SDMI - Proposed DEM and Imagery requirements for Alaska (Craig Seaver/Garth Olson)

- Alaska has been attempting to update statewide geospatial data for many years
- SDMI – Statewide Digital Mapping Initiative
- Summer 2008 Alaska DEM Workshop – Dave Maune Dewberry Report
- NDEP/NDOP Meeting in August, 2008 – Anchorage
- How we are coming to consensus within Alaska
 - No time to waste
 - Requirements: 20-foot vertical contour (Dewberry, Dave Maune); 15-foot contour accuracy (HDR User Survey for SDMI)
 - Seek a cost-effective solution: Airborne IFSAR is strongest technology candidate
 - Vetted through SDMI managers
 - Sept 18 Dewberry DEM white paper discussed: agreed to release draft a final
 - Oct 1 – DNR and BLM: establish oversight between Federal and State managers; SDMI would help fund future planning
 - Oct 13 – Meeting: DNR, UAF, DOT, BLM, USGS
- Next Steps
 - Phases:
 - Phase I: DEM implementation Plan
 - Phase II: Imagery requirements gathering and workshop
 - Phase III: Imagery implementation plan
 - Acquire contractor assistance in preparing DEM implementation plan
 - Funding from BLM, DOT and DNR, USGS contracting vehicle
 - Get on Federal budget cycle for 2010
 - Need to demonstrate “what’s in it for me” at a high agency level
 - Plan: Spreadsheet: see presentation: includes bringing in AGDC, imagery workshop, bringing back to NDOP, then to FGDC as well as including other agencies
 - Leveraging opportunities: GRAV-D, IFTN
- What do we need from NDOP?
 - Candid input – experienced guidance
 - Champions: help us move this along
 - Tell us what we need to know – looking for participation and input
 - Advocacy and Endorsement
 - How do we get to the agencies who are not yet involved?
 - Keep as transparent and open as possible

Questions/Comments:

National Park Service: has IKONOS for each of their parks – potential for partnerships

What are you trying to reach consensus on? 1) Issues of who wants to be in charge. SDMI, AGDC, UAF? 2) DEMs first or imagery?

How about high-resolution in some areas, and lower in others? Yes, a baseline requirement for all of state, then higher resolution in project driven areas.

Goal: statewide coverage

Should technical subcommittee look at specifications? Should Steering Committee provide oversight and guidance on funding?

The vertical datum is a major issue. NOAA, NGS, should be a part of this project.

What about Director Myers of the USGS? He has endorsed the need for data.

Spot Image Corporation, (Vendor Presentation), Bruce Ogden

- SPOT 1 - 1986; currently 3 satellites in orbit (2, 4, 5); 20- and 10-meter
- Plans for Pleiades 1 and 2 - .7m GSD, orthoimages at .5m, 20 km swath (2009-10)
- SPOT 6 – 2 meter GSD, 60 km swath
- SPOT 5 – 10m, 5m, 2.5m
- Largest provider of imagery to Google Earth
- Map of Collection Capacity: see presentation
- Nearly 5 million square km in Alaska; 87% of Alaska
- <25% cloud cover = 44%
- Would like a Direct Receiving Station (DRS) in Fairbanks – proposed by University of Alaska, Fairbanks
- Study – 2005 – SPOT 5 Satellite: With DRS in Fairbanks it would take 3 years to map the state: without it would take 5-8 years
 - This includes 10% or less cloud cover
 - Sun angle greater than 30 degrees
- DEMS: DTED 1 and 2 – lower 10% of Alaska
- Reference3D – collected in large areas; tri-stereo; high volume space triangulation (without GCPs); 30-meter DEM; ortho of 5m resolution;
- Absolute vertical accuracy is 10-30M CE 90 and absolute horizontal accuracy is 15M CE90
- Example of SPOT DEM – see presentation
- Masks: water, cloud – 8 masks
- Ground Control Points: do not need GCPs, but GCPs have been used to verify accuracy
- Accuracies have been verified by NGA, ISPRS, USGS, European Commission, other mapping agencies
- 84% of state in HRS (High Resolution Stereo) data (used for DEMs)
- Collected 220,000 km since August 2008
- Alaska DEM delivery time frame – October 2009 will have all HRS data; then could have DEMs completed in 12 months from order
- Examples of support to natural disasters: Hurricanes Katrina and Rita, California fires, Myanmar Cyclone, Ice Jams in Alaska – slide of disaster coverage this year (see presentation)
- Can deliver imagery in as little as 4 hours
- NGA – success story
 - SRTM Void Fill Project, Northern Africa Phase
- Imagery and licensing options
 - Imagery:
 - RBU License provides for use of imagery by local, state and Federal

- Not for use by DoD or for commercial purposes
 - Displayed on the GINA web site
- DEM:
 - Single organization license
 - State and local license
 - RBU license – same as above
 - NED license
- If work is done in Alaska = \$10.95 per square kilometer
- Conclusions: SPOT has archive source data and future satellite collection capacity to support the immediate and long-term imagery collection requirements over Alaska
- Base layer data

Questions/Comments:

What is the slope of the areas in the study? Do not know – can find out.

Action: Bruce Ogden will find out the slope of the study area in Alaska.

Would this data work in NED because of DTM requirement? Action: Jim Mauck will look into this issue to see if special requirements could be made for Alaska.

Do we need to meet National Map Accuracy standards in Alaska? Yes – so a DEM is crucial in Alaska

Alaska Requirement is 20' contour, 45 foot horizontal accuracy

Alaska Requirement is for end product to be available to everyone

NED license would include everyone – DoD is important in Alaska, so this license would be necessary

Fugro EarthData (Vendor Presentation) (IfSAR), *Scott Van Dermark, Tom Carson*

- EarthData was acquired by Fugro – an international geotechnical, survey and geosciences company
- Oil and gas company – 80% of revenue generated in this sector
- Airborne under Survey Division
- Fee-for-service based company – no licensing restrictions
- Acquisition – processing - product and applications
- Aircraft for both geospatial and airborne geophysics
- Leica ADS40; Zeiss DMC; Vexcel UltraCam X
- 8 LIDAR systems
- GeoSAR
 - Only dual-sided, dual-frequency (p-band and x-band), interferometric synthetic aperture radar (IFSAR) map system
 - Profiling LIDAR – helps to determine how well p-band is penetrating canopy; in place of ground control data
 - P-band has better penetration than LIDAR; even in dense canopy
 - Radar waves will reflect off an object with a radar cross section as large as the wavelength, therefore shorter wavelengths will hit the leaves and twigs and bounce back, while longer wavelengths will penetrate until it reaches larger surfaces such as tree trunks and ground

- P-band will reflect away on open areas (like a mirror) whereas the x-band will reflect back. This is why the combination is useful
- Orthos: p-band: 5-meter pixel; x-band is a 3-meter pixel
- x 1-2.5 meters; p 2-5 meters vertical accuracy
- Image products: false color images and stereopairs
- Digital Terrain Model (DTM): requires editing for bare-earth product
- Alaska Statewide DEM –
 - Experience in Alaska: they have flown geophysical data
 - Alaska needs:
 - Elevation: both bare earth and reflective surface
 - Need a geoid model
 - High accuracy requirements
 - Fugro offers an integrated solution
 - Differential interferometry can measure subsidence which may be important to differentiate from erosion
 - GRAV-D NOAA TAG sensor will work in Fugro planes, flight regime is also compatible
- Yazoo County, MS – USDA project
 - To augment or replace NAIP image data with radar imagery
 - Produce a high res DEM
 - Register with Common Land Unit Vectors
 - Used no ground control – differential GPS data only
 - GeoSAR derived crop classification using Definiens software

Questions:

What about ground penetration by p-band? Contingent on soil moisture (with moisture, will not penetrate). Have not seen penetration an issue in dry conditions such as in CA.

InterMap (Vendor Presentation) (IFSAR), *Greg Buckman, Lorraine Tighe*

- Elevation data since 1966
- IFSAR technology
 - Electromagnetic bands K, X, C, L, and P bands (in order, top to bottom of canopy)
 - P-band: longer wave length, ground, below ground, error can be introduced through bounce; p-band is difficult without interference from other obstacles such as telecommunications; poor signal quality
 - L-band: has broad radiolocation frequencies
 - X-band: return from mid-canopy
 - Semi-automated 3D editing system – 8 hours per 7.5 minute quad
 - Conducted a survey of customers: all buildings removed (rather than by size), same with trees, all removed, bridges removed
 - Result is a smoother dataset
- Paper using IFSAR data for IKONOS orthorectification – Example in presentation
- IFSAR used for orthorectifying aerial imagery
- Google Earth – improved with higher resolution
- Derivative datasets
 - Contours; slope and aspect maps; orthorectification; canopy height models
- Current project status – map in presentation – hope to have entire country completed by end of 2009
- Licensing Tiers:
 - 15 different licensing types

- Example: Hawaii – government access – Would derivatives be public domain ? Not sure, but probably not.
- Alaska – public domain – need to be funded up front, will not fly on speculation
- Single organization: most cost effective
- Federal Civil – all but DoD
- Federal Civil and State/Local

NDOP-NDEP Alaska Meeting Review and Analysis of Tuesday Afternoon Vendors Presentations

- Fugro licensing: fee for service base – no licensing, customer owns the data
- P-band cannot be licensed – Fugro broadcasts radar and takes pieces of band out (notch the spectrum). There is sometimes interference. They would coordinate with Airforce frequency manager (temporary permission to radiate.)
- Satellite vs. airborne IFSAR – leaves on trees move so there is no correlation in Satellite due to amount of time between passes.
- Concerns with regard to pre-staging acquisitions in Alaska:
- How far out is a ground receiving station: 3 months until up and running
- Advantages/disadvantages of a collection request vs. Ground receiving station – first is a one-time only – ground receiving station is continuous
- Dewberry paper – great ideas for sharing and including many requirements – how could each of these approaches meet requirements?
 - Intermap: read the white paper which includes requirements (on NDOP quickplace site) How many operating airports in Alaska? - 173 plus 2000 airstrips. Capabilities fit with the requirements in Alaska.
 - Fugro – medium resolution product seems the best solution. Can cover the entire state in a four month summer window.
 - Best approach might be integrated solution. Intermap and Fugro combined effort.
 - SPOT – base layer data where high resolution is not necessary. Don't have the money to get DEMs better than may be needed. Funding aspect not included in paper. Requirements for various technologies.
- Could 2-3 companies together do Alaska in one flying season. Fugro can do state in 5 years Intermap in 3-5 years.
- Is there a plan to use multiple vendors? Has not been developed to this degree yet.
- Intermap – need processing time to get high accuracy in DEM
- Flying height - Intermap 35,000, Fugro 39-40,000
- GRAV-D – 6 million dollar project – can this be combined? NOAA has talked to Fugro. Intermap can also do this. Have one flight do multiple tasks.
- Clouds not a problem, what about weather? They have experience in Alaska and can plan around major weather situations. Gravity sensor is more sensitive to turbulence. At these altitudes, should not be too much of a problem. Do you change altitudes? No, we fly entire project at one altitude.

Wednesday, October 8th

IFTN Issues Update and Actions

Ted Koch, Bill Burgess – Advocacy

- NSGIC – Conference – September 2008, Keystone, Colorado
 - IFTN is still the number one advocacy item for NSGIC, followed by Cadastral mapping, partnership funding (FGDC CAP), Transportation for the Nation, Technology for the 21st Century
- Not much advocacy occurred over the last two months. At the Mid-year NSGIC, February, 2009 they will hold a Technology Fair to target Congress, in conjunction with a Corporate Leadership Council

Questions/Comments:

What about Elevation for the Nation? Yes – NSGIC is working on all of the framework layers. Need to adhere to the Life Cycle plan for each of these programs. They are working on revising this procedure for advocacy.

What are the next steps for LIDAR for the Nation? No plans yet – willing to discuss this issue. NSGIC released a paper that was not well received by the LIDAR community at USGS.

NSGIC is supportive of all four ‘for the Nation’ initiatives.

IFTN for Alaska, HI, Pacific Basin, - How can NSGIC be an advocate for these areas? NSGIC has been supportive all along. Issue – is 1-meter program necessary, or, will 3-meter be enough? These details need to be addressed in the IFTN Business Plan. CBA dealt with these areas as well as CONUS.

Shirley Hall – IFTN – Status and Survey Update

- FGDC Steering Committee established Executive Committee – USDA, Commerce, DHS, NGA, EPA, NASA, DOI – SAOGIs (officials high up in each agency)
- IFTN Working Groups: Technical Plan (Business Plan); Funding Strategy; Contracting Strategy; Hosting and Archiving; Partnership Strategy; Guidance and Direction; Communication Strategy
 - Work groups working in tandem
 - 2-part Plan to be completed before end of calendar year
 - Re-scope of NAIP
 - Implementation Plan – same as original IFTN Plan, but maintain Federal focus
 - Sep 23 meeting – Champions and Chairs – results of survey, progress and timelines of each WG. Trying to get plan done by early October. (Moved up from end of year.)
- Technical Plan WG – Survey – analysis, crosswalk with CRSSP data, re-scoping of high-res program, working on report outline, governance strategy (gathered from contracting documents and other sources)
- Funding WG – trying to gather Federal imagery expenditures, looked at previous GeoLOB data calls, also estimating costs, also USDA and USGS estimated costs for programs
 - Issue: Shouldn't funding group be focused on strategy to get funding rather than on costs themselves? What is process? Guidance from OMB?
 - DOI – has approached all its bureaus to create a funding plan to support the high res program. Jim Cason pushed it out from the USGS level to DOI. USGS is paying 50% and other DOI agencies covering the rest - based on algorithm.
 - USDA and DOI are putting together an agreement to work together on this program, likely without specific figures.

- Partnership WG – documentation for partnership agreement practices and vehicles, potential role of private sector – oil and gas, etc.
- Communication Strategy – web site in development (Federal web page for IFTN), fact sheet in draft, developing an outreach plan.
- Guidance and Direction – headed by OMB – funding guidance? Governance templates by other LOB groups to be used
- Survey
 - Attempt to capture Federal imagery requirements
 - September 5-October 3
 - Preliminary analysis of survey:
 - Disparate number of responses from each agency – heavily weighted from DOI and USDA
 - Table of responses include all responses, then those excluding DOI and USDA
 - Will be made available in near future

Geoff Gabbott – Acquisition Management Subcommittee Report – Progress Report

- Presented draft guidelines document to NSGIC conference – comments have been incorporated – draft sent to NDOP members
 - Action: NDOP members – please get comments back to Geoff by October 24, 2008
- Next steps:
 - incorporate comments by NDOP
 - establish an adjudication procedure for changes to state plans
 - get revised document out by end of October
- Contracting Working Group
 - Compiled list of existing contracting documents
 - Industry capacity (ASPRS)
 - Meeting with satellite imagery providers to determine their role in IFTN
 - Investigating SmartBuy RFI
 - NGAC issues: procurement strategies, small business participation, contracting practices, and competition with private sector

Questions/Comments:

Were there any holes in the responses from NSGIC? - There were mostly editing comments and clarifications. Most states were pleased with document.

How is public review going to be conducted? It has not been decided - probably through industry channels. Not sure how to get out to users.

Thanks to Geoff for his hard work in this committee and on this document.

IFTN Technical Management Committee and NDOP Technical Subcommittee*, David Davis, Russ Jackson, George Lee, Tony Kimmet

David Davis – Technical Subcommittee Report

- Meeting – Charleston, SC – September 10-11, 2008
- IFTN Technical Issues

- QA/QC - using existing programs in USGS, USDA, state and local; input from IADIWG Quality Assurance
- Archive and distribution – Existing USDA, USGS – Data estimates: 39Tb/year
 - High resolution will be determined
 - Alaska
- 1-meter and high resolution
 - CONUS
 - PR, USVI, - same, but on 3-year cycle
 - Expanded NAIP specs
 - Buy ups or options
 - CIR or 4-band – recommends 4-band
 - Increased horizontal accuracy – recommends removing this option
 - ½ meter GSD buy up – recommends to add this to program
 - Alaska – waiting for information from the AGDC – DEM report – imagery workshop results –
 - Need to have requirements for Alaska in the IFTN report by end of year. Need requirements to create funding estimates. The acquisition of DEMs may bring up the previous funding estimate significantly. Alaska has cost estimates that can be used.
 - **Action: Garth Olson – supply estimates for Alaska to Jim Mauck**
- NAIP Attachment C, Template for IFTN specs
- **Action: David Davis: Schedule October 1 draft, December 31 final – will be put on NDOP web site**

Tony Kimmet – Hawaii, Pacific Basin, Puerto Rico, US Virgin Islands

- Satellite imagery – mostly IKONOS in the past – most of Pacific Basin collected
- IFTN specifications for Hawaii and Pacific Basin – two separate satellite specifications
 - Pixel resolution 1-meter or higher GSD, no re-sampling allowed
 - 4-band required – necessary for Federal government
 - Cloud cover at 5% or less on land areas
 - Two products: Pan-sharpen and non-pan-sharpen
- Licensing – in order of preference
 - 1. Public domain is most desirable – may be a possibility in near future
 - 2. Second most desirable – public domain minus third party commercial sales
 - How can this be enforced? By satellite company
 - 3. Sunset clause
 - 4. Unlimited use license by all Federal, state and local governments (ie: Civil license, like NextView)
- Puerto Rico and US Virgin Islands – aerial acquisition – national forests a problem due to cloud cover – fall and winter months (less cloud cover) – 3-year cycle

Russ Jackson – High Resolution Specifications

- Draft Specifications: 1' and 6" products
 - Outstanding issues: tiling schemes, coordinate issues, naming conventions (not many guidelines on 1')
- Buy-up costs cover more than production – should also cover QA/QC, archiving and distribution costs

Questions/Comments

Deliverables

- Is the CCM included within 1-m USDA – yes
- Should high-re orthos offer CCMs? No
- Should all products be metric? 1' or .3m - Government has been mandated to go metric. Should do both? Leave as is.
- Which buy-ups are for increased footprints?
- Which buy-ups are replacing the base product and which are in addition?

Should there be a buy-up for a ½ meter ortho within the USDA 1-meter program and if so, should we allow a higher spatial accuracy in the State Plan? FSA does not have a buy-up option for this. States do a separate, derivative contract outside of NAIP to get this option. Don't want some states with 1-meter and other states with ½ meter. Space considerations, QC, etc. Needs more discussion. Leave it as a derivative product for now. Kansas would like to have greater frequency vs. greater resolution – too difficult to manage the data.

With “redundant” versions of imagery, which version(s) go through IFTN review, archiving and distribution? Only most current? Whatever is acquired needs to be made available. Most current available on mapping service.

Does the 1' product footprint change if there is a buy-up to 6"? In other words, because it is 6", does the footprint change to Census Urbanized Areas, or stay ½ state at 6"? Stay within same geography: 1' goes to 6"; urban areas 6" goes to 3" as buy-up.

What's the minimum mapping unit for buy-ups? Minimum mapping unit for 6" is based on county footprints in acquisition document. This needs to be discussed with private sector. Need to have smaller units – western counties can be very large. What about small cities? This may be more of an acquisition issue. It is also a QA issue. Currently, USGS does QA on all 1' imagery. Which subgroup looks at QA/QC? Technical subcommittee. Attachment to acquisition plan. QA addressed for standards products, state plans will address QA for buy-ups.

Who reviews/approves/denies Business Plan? NDOP Technical Sub-Committee? Federal Program Stewards? FGDC? Discussion tabled until tomorrow under governance.

IADIWG – Inter-agency Digital Imagery Working Group Update, George Lee

- Camera Calibration – USGS Optical Sciences Lab – Reston, VA
 - In-Situ calibration
 - Cannot calibrate digital cameras on this type of equipment – needed to establish a new plan
- ASPRS is requesting that USGS find a solution to this problem
- Remote Sensing Technologies
 - Joint Agency Commercial Imagery Evaluation Team (JACIE)
- IADIWG formed to handle digital camera calibration among related issues
- Digital Camera Calibration lab at USGS
- Quality Assurance Plan – need common methods among agencies and industry
 - Contracting Guidelines
 - Sensor Type Certification
 - Data Provider Certification
 - Image Quality Assessment Guideline
- Web based tools to establish specifications and to make quality assessments

- Sensor Type Certifications: Applanix DSS, Intergraph DMC, Microsoft Vexcel UltraCam Da dn X, Leica ADS 40
 - Problem: they come out with new camera models faster than they can be certified
 - Process needs to be revised with new models
- Data Provider Certification
 - Initial plan drafted and in review
 - Proposed network of in-situ ranges across country
- Quality Assessment Guidelines – need to establish procedures across industry as to what is acceptable
- Lessons Learned
 - Common community agreement that an independent sensor certification process for use in acquisition tasks is needed
 - Consistent definition of sensor calibration terminology
 - Problems associated with non-disclosure and proprietary information – cannot get advanced notice of camera development
 - Need for National acceptance and implementation of guidelines – no agency has jurisdiction. USGS will publish guidelines, but there is no way to enforce. Would like IFTN to make this a requirement.
- What about LIDAR? IFSAR? and other sensor systems?
- International collaboration – Canada (University of Calgary), European Union (Stuttgart)

Questions/Comments:

Is it that industry does not value certification enough to have certification done before announcing new product? They want to keep their products secret while in development.

LIDAR – Field checking is still required of LIDAR at FEMA. Will that be necessary in future? Field checking is expensive. If you can be assured that contractor is using best practices then that is good way to assure a level of quality of products. Should be able to classify projects by level of quality checking.

How does IADIWG deal with rapid change in technology? Set up a governance model. Manufacturer has a process in place that products are tested, so camera model is of consistent quality. Reluctant to impose ISO 9000 compliance due to cost for small companies. Companies such as Leica are large enough and have stringent quality checks. The larger companies are not really the issue, it is the smaller companies. They don't have the expertise to test, and they don't have the money to work with USGS to have them test.

Is some of the lack of trust based on different countries having different methods? Distrust is based on competition. The more people involved, the greater chance for leaks.

Issue: if end product meets specification, then why is there a need to do this testing? Different approach.

Medium Format Cameras, USGS - Jon Christopherson, USGS

- Large vs. medium format
 - Medium format now is approaching film resolution
 - Leica ADS40 is only large format camera, others are actually sum of medium format
 - Medium format cameras:

- Phase One P 65+ digital back - 6" GSD at 3,000'AGL, 1m GSD at 20,000' AGL, swath width still narrower than film
 - Kodak 50 MP CCD – Hasselblad back, make this into an aerial camera, spectral instruments 100 megapixel
- Can medium format do the job?
 - Yes, technically they can do NAIP quality work, but are they the best choice? – cheaper, lighter, faster, but less base to height ratio, smaller footprint
 - Bayer Pattern array – red, green and blue pixels – interpolation so no forward motion, slight drop in resolution, minor spectral effects
 - 4-color with Bayer Array – filter used to block IR or block blue, less spectrally pure
 - Chromatic Aberration – color fringing – prism effect, blue fringe and red fringe
 - Multiple-camera spectral – each band collected by separate camera, merged for final image, ideally collected at same GSD, no chromatic aberration, good resolution, forward motion compensation, but, more costly, more calibration and more processing
- Applanix Dual-Cam – dual cam used two cameras: RGB Bayer array and monochromatic near-infrared
- LIDAR
 - More applications being developed
 - More than terrain data
 - Is simultaneous collect (LIDAR and imagery) beneficial?
 - Benefits medium-format with terrain info
 - Good for imagery processing purposes
- USGS/IADIWG type Certification
 - Four systems have been certified to date, many new cameras not yet certified – most new cameras are medium format
 - Many systems are being designed from the ground up rather than adaptations
- Sensors around the world:
 - Applanix DSS, Intergraph DMC, Leica ADS40, Vexcel UltraCam (these are the ones that are currently certified)
- New Technologies – Observations
 - Competition
 - Important difference between a camera and a system (systems includes processing, etc.)
 - Larger chips are greatest change in technology
 - Other developments are processing methods (cheaper and faster)
 - Sensors are cheap – only small part of whole business case in creating imagery
 - Smaller formats – cheaper cameras, cheaper airplanes, UAVs in the future
 - NASA is using medium-format cameras up to 60,000 ft
 - Issue: How to specify new developments
 - Need further research for the camera adaptations being created
 - EROS has calibrated about 40 of these types of cameras

Questions/Comments:

What is the price range of medium format cameras? About \$30,000 for a 39 megapixel. Can re-use Hasselblad cameras by replacing back with digital. Cannot re-use 9X9 camera backs.

What about small format such as John Deere? Doesn't know status yet.

What are top three criteria for evaluation? It depends upon the application.

Leica GeoSystems, (Vendor Presentation), Shawn Slade

- 188 years in measurement technology
- More than 1,000 patents
- Headquarters in Heerbrugg, Switzerland
- ADS80 is successor to ADS40
- ALS50-II – LIDAR – scanner assembly, rackless electronics
- ALS60 - different IMUs in one hood – LIDAR – easier to put in plane, improved pulse rate, improved scan rate of mirror to 100Hz, larger optical aperture, fewer drop-outs of low reflectivity. Added real time coverage verification.
- MPiA – multiple pulse in the air technology – two pulses out simultaneously
 - 33% increase in maximum pulse rate over ALS50-II. Handle greater terrain undulation.
 - Project overview:
- ALS Corridor Mapper
 - Cap flying ceiling at 500 meters above ground, helicopter flying, powerlines, etc.
- RCD105 Digital Frame Camera for ALS LIDAR
 - High performance imaging for LIDAR
 - User-replaceable shutter
 - Can fly imagery and LIDAR simultaneously
- ADS80
 - Large format sensor
 - Developed from ADS40
 - Removable flash drives
 - Faster transfer data rate – 130 megabytes per second
 - Improved flying speeds
 - All data captured at same resolution, no need to pan-sharpen
 - 100% forward overlap
 - Best base to height ratio of large format cameras
 - 5 cm imagery examples in Switzerland (less than 2")
- Accuracy tests for mapping
 - .69 foot vertical accuracy at 95%
 - .77 foot horizontal accuracy

Questions/Comments:

Is ADS80 still a pushbroom? Yes

What is price for 105? About \$230,000 with Corridor Mapper \$1million

Tour # 1 – National Center for Atmospheric Research

Forest Service use of HR Orthoimagery in Colorado and Wyoming, *Melinda McGann, USDA-FS*

- WY – Bighorn NF; Medicine Bow NF; Shoshone NF
 - Ten year cycle
 - Shoshone in digital – delivered summer 2008
- NE – Pine Ridge NF; McKelvie NF; Bessie NF planted forest
 - Working on orthorectifying photos from fire area
- These will be used for storm assessments including change detection, among other tasks
- SD – Fort Pierre National Grassland, Buffalo Gap NG
- KS – Cimarron NG – used NAIP to look for Tamarask encroachment
- CO – Comanche NG; Rio Grande NF; San Juan NF (Sudden Aspen Decline); San Isabel NF; Pike NF; Gunnison NF; Grand Mesa NF; White River NF; Arapaho NF; Roosevelt NF; Pawnee NG
- Mapping land use in forests, change detection in Arapaho and Roosevelt using Landsat data.
- Arapaho/Roosevelt – beetle infestation – need imagery to map dead trees – decided on digital imagery and sent out RFI for costs.
- Also, Bighorn NF, Pawnee NG, Arapaho/Roosevelt, White River NF – wrote up contract for 1' 4-band imagery. The distressed trees are much more visible with the infrared band.
- Rocky Mountain NP will also be collected since National Forest surrounds it.
- Need for contracts between DOI and USDA so that money can be shared more easily for these types of projects
- Stereo imagery has also been extremely useful.
- Now working on requirements for Remote Sensing Center in Salt Lake City to serve this data
- Comments by Geoff Gabbott: This was a great learning experience between APFO and this USFS region. They will have variations on interim product. It helps to have contractor willing to work with APFO. Thanks to Jason Caldwell from Sanborn.
- Conclusions: 4-band, especially the infrared, and stereo imagery are valuable products for work in the USFS.

Questions/Comments:

Is resource photography always stereo? Yes

Comparison between automated classification analog vs scanned sensors – has not been studied.

Would ½ meter work for this project? Yes, it would have worked. 1-foot will be better for photogrammetric uses though.

No licensing restrictions on data. Need to figure out reproduction costs.

4-band solution has been valuable for vegetation applications. Has anyone done a comparison over same area with 4-band and with only natural color? No, this has not yet been studied.

NAIP/High Resolution Orthoimagery in Southern Colorado, NAIP 2009 Funding Support and Calibration of Digital Cameras in Pueblo County, Colorado, *Chris Markuson, Pueblo County GIS Manager.*

- Imagery Projects
 - 2004 – Sanborn – orthos photos and LIDAR
 - 2005 – forest fire – DigitalGlobe – 4-band, 1-meter

- Used for wildland fire assessments
 - Derived products: vegetation, structures, unofficial roadways (dirt paths)
 - 2007 – Pictometry –
 - Oblique 4" – assessment applications, SWAT Teams, address management, vertical element measurement
 - New collect of LIDAR
 - Orthos are from nadir, obliques taken at same time
 - Captured about 1200 square miles
 - Problem with Pictometry - copyright
 - Digital imagery validation range
- Pueblo is a growing area and could use a high frequency of data
- Fountain Creek – storm water runoff from Colorado Springs. Need high frequency for this as well
- Using Imagery
 - ArcSDE
 - Pros: secure (assigning individual permissions for each layer is useful), centralized, rapid display at any resolution, great for online applications
 - Cons: difficult to load data into database, robust server required, very expensive (ESRI license plus a relational database)
 - ArcGIS Image Server
 - Pros: easy and fast to load, rapid display of basic imagery, good capabilities
 - Cons: too complex, no documentation; very expensive, bugs
- Using Elevation Data
 - Store it in ArcSDE – bare earth rasters, works for small areas
 - .LAS format QCoherent LP360
- Southeastern Colorado Regional Initiative
 - Grant from USGS for data repository
 - Each county uses NAIP extensively
 - Doing assessment for all counties in this group including all of their GIS
 - Centralized Data Warehouse, shared software licensing, integrated with Assessor/Treasurer systems
 - VMWare-based powerful server
 - 9 of the 14 counties rely on NAIP – have very little money
 - Community Wildfire Protection Plan – requirement for funding after a wildfire – need NAIP for this program
- 2009 Statewide NAIP Buy-up – trying to get all the counties in this initiative to participate by tying it to the CWPP.

NAIP 2008 Update, *Shirley Hall, Kent Williams, Geoff Gabbott*

Shirley Hall – 2009 Funding

- Plan was signed off
- Partnerships with USGS, USFS and NRCS
- On Continuing Resolution until March and possibly until end of year
- NSGIC advocacy
- NAIP vendors have formed a consortium for advocacy for IFTN plan and support for present NAIP plan

Geoff Gabbott – Contracting

- 2009 – \$25.2 million
- 2008 - NAIP, small aerial photography, resource, Alaska Chugach – graphic with breakdown by cost – see presentation
- 2009 – cost breakdown similar to 2008.
- 2008 20 states – all 1-meter – see graphics in presentation
 - Expanded 4-band requirement
 - Expanding absolute control – vs. relative control
 - 99% of imagery flown
 - 51% CCMs delivered
- 2008 Small area contract
 - NRI – National Resource Inventory sites
 - Puerto Rico
 - Hawaii
 - Alaska
 - Flying season in CONUS and Alaska – Feb-Oct – progress northward during crop season
 - Wetland Reserve Exposure Locations – 98.6% flown
- Resource Aerial Photography – USFS – finished Chugach (many weather issues), Rock River Watershed VT, and many western forests – see presentation
 - Status of 2008 Acquisition, 2009 Funding, 3 Year Cycle Update
 - JPEG 2000
 - Absolute Control, and Seam Line files

Kent Williams – Future Plans – NAIP 2009

- Funding
 - 3-year cycle
 - Plan based on date of existing orthoimagery
 - Goal – trying to get full-state coverage
 - Funding model based on FSA paying for agricultural lands, partners at national level for full-state coverage
 - USGS, NRCS and USFS partnering
 - State partner costs – 10% of FSA contribution minimum
 - These are funding estimates - the exact costs are unknown until bids come back in
- 4-Band – the only buy-up option – graphic of 4-band vs natural color states
 - Problems with J2000 image compression
 - No problems with quarter quads
- Accuracy Specifications
 - Horizontal accuracy – absolute control increasing over relative control
 - The feedback from vendors is good
- Seam Line Polygon
 - 2007 NAIP AZ pilot – ADS40
 - Issue: FSA and other agencies need to know the exact date – problem along seamline
- Distribution – File Based
 - Cost share partner
 - quarter quads delivered after QA on hard drive
 - CCMs delivered to partners after initial delivery from vendor
 - Public Downloads
 - CCMs on USDA Geospatial Data Gateway

- Custom Orders
 - Ordering system built on EarthWhere
- Distribution – Image Services
 - State based projects – image server
 - All years on-line
 - Bulk orders, hard copy, etc.
 - APFO Customer Service Section
- Gateway CCM downloads in FY2007 – potential other Federal agencies to target for cost share
- 4-band imagery will be put on Image Server

Questions/Comments:

Waterton Canada (opposite Glacier NP) – want to partner – how can this be done? Have to get it cleared through the State Department. What if Canada were to initiate the process? Need to know the contacts in Canada, the d Shirley can work with the State Department. What are the specifications? If the plane does not land in the country, then it is not such an issue. If they do land, they need to get the export licenses. What about Canada handling the contract directly (derivative contract)? This might be an easier approach. NAIP has to remain first priority though.

What about states that want to acquire LIDAR and want imagery in same time period? How do they coordinate? Try to do it in NAIP 3-year cycle.

What about state 2-year funding cycle? Was this looked at when NAIP cycle plan was established? No, this was not looked at. Simply having a plan available helps everyone to plan ahead.

Thursday, October 9th

NDOP Chairs Selection, *Jerry Harlow/Tony Kimmet*

- Steering Committee – USGS – George Lee
- Project Subcommittee – Could this committee put together a report about the cooperation and the return on each agencies investment. Target: for our own agencies?; OMB? This idea was tabled for the time being
- Technical Subcommittee – Erik Hund – NOAA
- Acquisition Subcommittee – Geoff Gabbott - FSA

NDOP Spring 2009 Meeting Information (Tony Kimmet)

- Spring Meeting Location – a location was not chosen. There was discussion as to whether it still serves this committee to have meetings in different locations. It was thought that it might be good to have the meeting each time in Washington, DC. The problem is that it requires the same people to have to travel. It appeared that most people prefer to continue to have the meetings throughout the US. Local participation is higher, therefore more involvement in the program.
- May, 2009 – no specific date chosen
- Many thought it would be good to have a topic of focus at each meeting, such as was done at this meeting.

NDOP-NDEP Meeting Review in Alaska (Sensitive)

- NDOP Chairperson (Jerry Harlow/Tony Kimmet)

- NDEP Chairperson (George Lee)

- All presentations from Alaska are on NDOP Quick Place site and on AGDC site.
- What can NDOP do to move forward imagery and DEM needs in Alaska?
 - Alaska representatives should get their needs on the IFTN proposal
 - Inclusion of DEMS in Alaska within the IFTN
- Decisions for Alaska will affect the work done in each subcommittee
 - For example, including DEMs in the contracting process
- Are estimates for DEMs included in the IFTN funding? Partially, but not across the board. Some states averaged the DEMs into the costs. DEMs were not included in costs for Alaska in IFTN. Estimates required elevation data, but not costs for processing into DEMs.
- Contracting – would like to see it as sustained funding with a separate program management oversight, rather than a single agency. Industry will need to fly Alaska together, so there needs to be some oversight, possibly a single contractor will gather the contractors together.
- Issues include processing, storage and serving such a large amount of data
- Is there an agreement as to specific imagery resolutions over specific areas? All Alaska currently has 1-meter. This could be refined during Imagery Workshop. 2.5 meters may suffice for certain areas.
- What elevation data is necessary to satisfy the imagery requirements?
- Need improved elevation model to reach 25 foot accuracy requirement
- Requirement is likely to be 1m-2.5m. Less than that has been done recently.
- NRI and other programs are capturing small villages. Ground control is part of product, but not available. Alyeska owns this data.
 - **Action: Tony – Find out about Ground Control in Alaska**
 - Question: is the Census Bureau collecting control points along pipeline? This was heard at a recent CRSSP meeting. Anne O'Connor stated that she did not believe this to be true. **Action: Anne will check on this.** (Note: after checking with Randy Fusaro, it was confirmed that the Census Bureau is not collecting control points along the Alaska pipeline. Rather, her comment at the CRSSP meeting was that the control points used for the Alaska imagery collected for the Census Bureau was made available with the imagery data.)
- USFS is using classified imagery for control on the Chugach. Could this be used for Alaska? Who would do work?
- Chris Noyles has met with Carolyn Holland on this issue. She is focused on SE area. At this scale this may be accomplished. Slow and tedious.
- Need to create a plan that is consistent with IFTN.
- **Action: Garth will get raw imagery and elevation cost information for Alaska to Jim.** For now, the recommendation is to go with 1-meter for the whole state. Then, at the Imagery Workshop in January, this can be refined. Use this as a basis for elevation costs.
- Keep in mind this is a high level plan, not an implementation plan.
- If you want specific language, please include.
- This would go in technical plan of IFTN. Should Alaska be a separate section? No
- This should not be buried in rest of document. Possibly put special requirements in an Executive Summary.

Briefing on Data Delivery Technologies/IFTN, Douglas Binnie, Kent Williams, Tony Kimmet

Doug Binnie – USGS Access and Distribution Challenges

- Challenges: increased information, aging system
- The National Map Seamless Server – can view data, but downloading data is the main purpose
 - Has been in place over 6 years, but does not work as well for every purpose, especially at slower connection rates
- Graphic of Best Available Imagery – see presentation
- High Resolution orthoimagery that is being processed and expected acquisition graphics
- Increases in the amount of data ingested each month.
- A lot of data is going out by external drive due to the size of files – too large to download
- About 1.2 million visitors per month – traffic getting too large for site
- As new data replaces older in Seamless, the old data moves into a tiled data system silo and has to be requested by tile.
- Image Server
 - It is slow to load data in the Seamless Server (SDE based). Need to load instantaneously for emergency use
 - Benchmark System for Emergency Operations – they have been testing various systems
 - Contracted with Parallel Incorporated to test
 - Found ESRI Image Server and Pixia Server both to be good – chose ESRI Image Server to do emergency imagery distribution (Image Server does not have a proprietary format and was of good speeds)
 - Are they going to run both SDE and Image Server at the same time? Yes, for awhile. Image Server does not run vector datasets. Probably most raster datasets will be migrated over to the Image Server. Image Server will have access to all, not just emergency operations.
- Accessing Data – replacing browser capabilities
 - Have developed a prototype – hopefully will be released by end of 2008
 - Will replace Seamless Server interface

Questions/Comments:

What about working with ArcServer for the vector data? Not yet.

Web mapping service is different from the real data.

USDA – compressed JPEG file vs real data – study in Alaska. JPEG is smaller and faster. Can use less band width. Streaming a JPEG file is faster than GeoTiff compressing into JPEG. Can stream to a PDA. Great for emergency services. Also good for scientists in the field at agencies such as NRCS. Problem: need to be in an area with broadband coverage.

Has USGS ever looked at throttling the downloads or putting a charge on it? How can USGS and USDA achieve a consistent policy? They are not currently throttled for firewire drives. No charge at this point. Is there an estimate for cost for bandwidth at current use? Don't know off hand. Now using 10% of bandwidth for this activity. 2 gigabyte per second capabilities.

What is the current discussion at USGS? Coming out of Geography – Barb Ryan – about not charging. EROS will not be charging at all starting in October, 2009.

USGS Elevation has discussed bulk loading charges.

Food for Thought: Once everything is free, how do you change the paradigm of getting everything you have rather than just what you need at the time?

Can this be put as a concern in the development of the new Image Server at USGS, or within IFTN? Data ingestion and serving costs can be calculated and put into IFTN. Problem, it is just an estimate. Need to touch base with the funding group in IFTN to discuss as an issue.

Seamless (by self-defined area) and Gateway (by county) use different ways to throttle. Data and Delivery Archiving Team will put forward a recommendation as to what method is best for IFTN.

Agency Reports

NGA (Bill Nellist) – NGA Commercial Airborne Imagery Program: FY08-10

- High-resolution imagery coverage – Status Map – see presentation
- 190 imagery set delivered from USGS processing in 2008 – major increase over previous years
- Several off-the-shelf purchases – sent to EROS
 - Example – Simi Valley, CA
- Status map of imagery on order – see presentation
 - There are additional off-the-shelf purchases
- Status map of FY08 – does not include off-the-shelf, or Border Initiative
 - USGS is doing QC work on Border Initiative imagery – public domain
 - Not sure how it will be distributed yet – can Canada and Mexico data be put up? Yes, for Mexico, not sure for Canada yet
 - Does not include Canadian/Alaska border
- National Special Security Events (NSSE)
 - Phoenix – partnership
 - DC, NY – partnership
 - Denver – partnership
 - Minneapolis – GPSE
 - Cedar Rapids – partnership
- Sharing Bare Earth LIDAR – given to USGS to load into NED – 180 areas being evaluated – a joint announcement will be made.
- FY09-FY12 Status Graphic
- FY09 – events: Inauguration, Super Bowl – Tampa, All-Star - St. Louis
- FY10 – events: Super Bowl – Miami, All-Star - Anaheim (not yet contracted)
- List of FY09 and FY10 areas: see presentation –
 - Looking to do entire Washington state
 - El Paso will be on border collection

Questions/Comments:

Is there interest in National Guard bases? Yes – there have been requests for FY09

Is this available through USGS? Yes – most, there was some FOUO (as defined by states) – some have a one-year sunset clause.

What about Juneau, Puerto Rico and Honolulu and other areas that are on FY09, but not yet purchased? May be put on GPSE or delayed to FY10 to find partnerships.

Puerto Rico – what are you trying to acquire? Corps of Engineers just flew 1-foot (07 and 08). EROS has the data. Includes the Virgin Islands.

How often is city collection? Every three years, top cities every 2 years

What about transportation networks between cities, or pipelines? Have not yet acquired this type of imagery, but would like to look into this. Charleston, WV collection for 2009 goes from Charleston to Huntington.

NPS (Mike Story)

- 390 Park Service units – not just National Parks – 84 million acres
- Partnered for satellite data and occasionally with NAIP
- Inventory and Monitoring program – used older NAIP
- Difficult to predict needs for future projects – no central purchasing department
- Used GPSC contract with USGS
- Applications: cultural resources (LIDAR useful), vegetation, fire, search and rescue,
- Partnership with DOI for funding NAIP – putting in more money than before, but receiving a lot of imagery in return
- NPS doesn't have the band width to serve data. It is sent on external drives.
- Historic imagery at EROS. Trying to get Inventory Monitoring units to look at last 50 years of data.
 - Ex: Canyonland – law suit
- Project to acquire imagery for Appalachian Trail – vegetation mapping– would like imagery during fall.
- LIDAR data for landscape dynamics along coast – ex: Assateague – used Earl
- Bathymetric data useful as well

Questions/Comments:

What does Glacier NP want to contribute to? Glacier NP would like Montana to get 4-band. Want to look at change over time.

BLM (Russ Jackson/Garth Olson)

- Historical imagery – stored in Denver – index internal to BLM – may contact Russ with area of interest – film holdings maintained by library - catalog
- Alaska – keeping in close communication with Alaska staff for support
- All digital holdings are not maintained in same place, will eventually be put on same index as film holdings
- IADWG site – hoping to utilize certifications by local contracts
- Developing database for tracking geospatial acquisitions
 - Can now point to dollar amount of contribution to DOI portion for NAIP, can see return on this value

USGS (George Lee/Jim Mauck)

- Orthoimagery Program
 - High-res with NGA and State programs
 - Leaf-off, 1 meter
 - 11 states, 1-meter NAIP

- Current program requirements
 - 1-meter
 - Emergency maps
 - Priority areas
 - DOI and USGS Science Areas
 - IFTN
 - 1-foot
 - Urban areas
 - IFTN
 - NGA Border Project
 - Operational support – validation and QA
 - See status map for borders, urban areas and science program areas
 - Boston, Denver, Chicago, Texas areas
- NGP – FY09 Orthoimagery Program goals
 - Re-scope Urban Area program to be part of IFTN high-res program
 - QA for NGA border project – 40 mile swath (30 in US and 10 in Canada and Mexico) – 38 terrabytes of data
- Elevation Program Goals
 - 10-meter – complete revision of the 10m data over next 3 years
 - 1/9 arc second – continue collaboration with NGA on LIDAR for Urban Areas program
 - Make Alaska a High Priority Area within NGP program
 - Partner with AGDC for elevation and control FY09
 - Partner with AGDC to partner on Alaska for elevation and control
 - LIDAR data
 - Graphic of elevation – see presentation
 - Elevation Acquisitions of note: Kenai Peninsula, AK, Denver, CO; Rainwater Basin, NE-KS
 - Issues: program direction is stabilizing; Alaska; Project Review Process – new process; integration; IFTN vs. National LIDAR Initiative

Questions/Comment

Request: **Action: George Lee: schedule a presentation on the Graphics program and vertical integration at the next NDOP Steering Committee Meeting**

USFS (Bill Belton)

- 2008 Resource Projects – Status Map – see NAIP presentation
- National Level – \$1.65 million funding for orthoimagery – will request \$2 million for next year for NAIP and Alaska projects
- Regions responsible for the imagery for their individual projects – cut back in regional photography
 - Ex: no resource scale photography in Oregon or Washington this year
 - Ex: California – had a five year cycle, now a ten year cycle
- NAIP is being used extensively in the field – leaf-on, natural color meets their needs
- Colorado flew a lot of imagery (see earlier talk), but may not be able to keep up this level of acquisition
- Therefore, the ½ meter requirement in IFTN is of interest to the USFS due to lack of money in regions for resource scale photography.
- There is also an increased need for stereo imagery
- Infrared also useful to the needs of the FS – 4-band useful for many agencies

- RSAC – David Grey – Salt Lake City –
 - ERDAS – Apollo –
 - FS product is at end of Phase 1 – clip, zip and ship format completed

Questions/Comments:

NDOP should try to increasing the funding for 4-band acquisition since this is of interest to so many agencies.

How about a DEMO on the ERDAS/FS technology at the USDA meeting in Salt Lake City on the NAIP contract in November? Yes, this will be worked out. **Action: Geoff or Shirley schedule a DEMO on the ERDAS/FS technology at the November USDA meeting in Salt Lake City**

NRCS (Jerry Harlow, Tony Kimmet)

- NRCS Funding Priorities and Acquisitions for FY09
 - NRCS supports the NAIP 3-year cycle
 - NRCS would like to emphasize Alaska, Hawaii, Pacific Basin, Puerto Rico and Virgin Islands – these have traditionally been underfunded – there is a need for a good funding model for these areas
 - No actively Federally funded, state-wide, leaf-off, orthoimagery – Louisiana (local NRCS) and Michigan (local NRCS and state) particularly interested – 1-meter
 - Has FSA thought about asking NRCS State GIS personnel for assistance in generating funding for NAIP within a state? Discussion: They have some, it depends upon state. Could NRCS do this as well? Something from the national level from both agencies will help those at the local level coordinate. Maybe under Service Center Initiative.
- Orthoimagery Status
 - Hawaii – All has been contracted for except Oahu (done by USGS)
 - Now complete coverage of all the islands except 26 QQs on the big island of Hawaii (due to cloud cover). NRCS will now accept the best of the remaining QQs. Island has been tasked for the last two years.
 - Leica will try and mosaic the island of Hawaii using technology of ER Mapper (the company they bought).
 - Pacific Basin - Digital Globe update – table of areas covered – see presentation
 - New funding for Hawaii and Pacific Basin
 - To purchase new satellite data
 - Working with USFS and NOAA – there are occasionally matching issues
 - USGS/NOAA/USDA are working together using a common set of DEMs. GCPs are being collected.
 - USDA and NGA are working on orthoimagery that may be available through NGA contacts
 - Priority List – see presentation – top priorities are where a soil survey needs to be done
 - Agricultural use is changing in Hawaii
- Increasing trend to digital from film
 - Film and film cameras will be less available in future
 - Requirement for NRI will now require 4-band image
 - Digital imagery pilot test – purpose: evaluate the effects on NRI by going to digital
 - Film and digital at same time frame – 6” – will be able to share this data
 - Project area – croplands, wetlands, and forestlands – clusters of counties in Arkansas, Missouri, Iowa – if counties have LIDAR, that will be used

- Want to evaluate 4-band digital imagery and elevation data to annually monitor over 11,000 to maintain watershed dams

Questions/Comments:

What about using multiple digital sensors for pilot project? This is possible. The details have not been established yet.

Who is responsible for maintaining dams? Local taxing which is no longer done. Program in Farm Bill: Dam Rehabilitation

Tour # 2 – Science on a Sphere

NDOP Steering Committee Governance Discussion

- Action: George Lee will schedule an NDOP teleconference in January
- Action: Shirley and Anne: Take existing NDOP documents (Business Plan) for governance and add concepts from today's discussion.
- Action: Steering Committee will review this document
- Action: Anne: NDOP Report for last five years: What is NDOP? History of NAIP and High-res programs.
 - Action: Shirley and Geoff – get NAIP history to Anne including state participation
 - Action: Jim and Bill Nellis – get High Res history to Anne
 - Action: BLM, USFS, NRCS, Census, FEMA - Cost avoidance from each agency
 - Action: Tony and Russ: Technical analysis examples
 - Action: All – improvements in quality of imagery over the years