> Presented to: Los Angeles County

LA County Kickoff Meeting
Team Introduction

By: Greg Tilley

October 26, 2005

VARGIS
An Infotech Enterprises Company

> Introductions *The Geospatial Experts*

MERRICK® BUILDING QUALITY SOLUTIONS

3001® the geospatial company

PHOTO SCIENCE Geospatial Solutions

Stantec

GE Energy

VARGIS
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> Introductions *The Geospatial Experts*

VARGIS Team

- VARGIS
  - Prime Contractor
  - Project Mgt. / QA
  - Ortho production, DTM and Contours (Area 1 and 3)
- Geodetic / Stantec
  - Surveying
- 3001
  - DMC Acquisition (Area 1)
  - Ortho Production (Area 1)

> Introductions *The Geospatial Experts*

VARGIS Team

- GE Energy
  - DMC Acquisition (Areas 1 and 2)
  - Ortho Production (Areas 1 and 2)
  - DTM and Contours (Area 2)
- Photo Science
  - DMC Acquisition (Area 1 and 3)
  - LiDAR Acquisition / Processing (Area 1)
- Merrick
  - LiDAR Acquisition / Processing (Area 1)
  - Breakline collection (Area 1)

> Presented to: Los Angeles County

LA County Kickoff Meeting
Project Overview

By: Gerhard Sehnalek

October 26, 2005

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> Project at a glance *The Geospatial Experts*

- Project area covers 3,954 sq. miles
- Color Digital Aerial Imagery Acquisition
- Digital Ortho Imagery
- LiDAR Acquisition
- Digital Terrain Model
- Contours

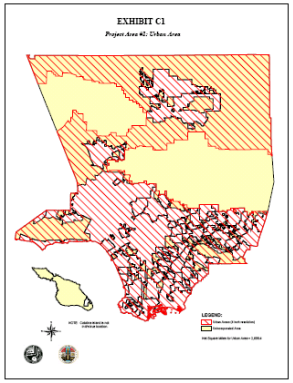
> Project at a glance *The Geospatial Experts*

Purpose for LA County Consortium:

- High resolution orthorectified imagery
- 4 inch ground pixel size
- 1 foot ground pixel size
- County-wide Digital Terrain Model
- High accuracy 2 foot and 5 foot contours

> Deliverables *The Geospatial Experts*

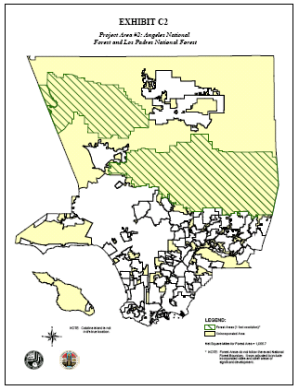
LAR-IAC Project Area #1 (Urban 4-inch Ortho)



> Deliverables

The Geospatial Experts

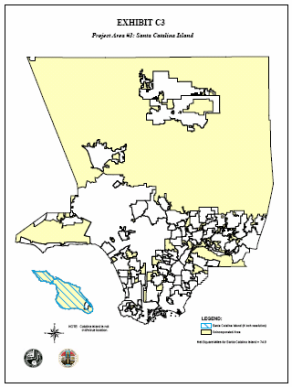
LAR-IAC Project Area #2 (Forest Areas 1-Foot)



> Deliverables

The Geospatial Experts

LAR-IAC Project Area #3 (Catalina Island)



> Project at a glance

The Geospatial Experts

Objectives for LA County:

- **Objective 1:** Obtain high accuracy aerial imagery to support all government needs
- **Objective 2:** Unify aerial imagery to improve communication among LA County government entities
- **Objective 3:** Integrate aerial imagery with GIS parcel database and other GIS layers
- **Objective 4:** Eliminate multiple acquisitions from government agencies for the same area
- **Objective 5:** Save taxpayer money
- **Objective 6:** Important tool for effective government operations (local, state and federal level).

> Project at a glance

The Geospatial Experts

Objectives for VARGIS Team:

- **Meet all LAR-IAC Objectives**
- **Provide Timely Deliveries**
- **Provide products that meet first time acceptance**
- **Provide products that meet standards & specifications**
- **Support LAR-IAC with timely response to requests**

> Project at a glance — *The Geospatial Experts*

- **Geodetic Control :**
  - 300+ points
  - Targeting November 2005
  - Tie to existing NGS control
  - Utilize existing control within project area
  - Establish new control where needed (H / V)
  - Develop geodetic network
  - Final adjusted coordinates for each point
  - Epoch to be confirmed by LAR-IAC

> Project at a glance — *The Geospatial Experts*

- **Digital Aerial Image Acquisition:**
  - Three (3) state-of-the-art digital sensor (DMC)
  - Color and CIR Digital Aerial Imagery Acquisition
  - 3,000' above mean terrain (nominal .3' pixel)
  - 12- bit original imagery converted to 8 bit
  - > 34,000 exposures
  - >13,530 line miles

> Project at a glance — *The Geospatial Experts*

- **Special Considerations** – Image Collection
  - Steep terrain considerations
    - Line breaks for altitude change
    - Forward gain adjusted within lines
    - Raw pixel size will vary on steep models
  - Radiometry considerations
    - Representative land cover samples supplied
    - Rapid review by selected LAR-IAC representatives
    - Approved image chips distributed to each team member

> Project at a glance — *The Geospatial Experts*

- **LiDAR Acquisition:**
  - Two (2) state-of-the-art sensor ALS50
  - 9,500' above mean terrain
  - Raw data collection interval 2' – 10' (ave. 1.7m)
  - > 1,200,000 collected points / sq. mile
  - > 800,000 usable points / sq. mile
  - Surface Model Delivery (gridded or raw – TBD)
  - Bare Earth Delivery (gridded or raw – TBD)

> Project at a glance — The Geospatial Experts

- **Aerial Triangulation:**
  - Combination of Automated and Manual
  - Process >33,000 models
  - each model 100+ points
  - Geo-referenced to ground control
  - Least square adjustment (bundle adjustment)
  - Final adjusted coordinates for each point
  - RMSE 10 microns on passpoints/tiepoints
  - RMSE 12 microns on ground control
  - Blocks tied between production units

> Project at a glance — The Geospatial Experts

- **Digital Orthophotos:**
  - High resolution imagery (4 inch and 1 foot)
  - 4" delivered in color and CIR
  - Tile grid and pixel dimensions confirmed with LAR-IAC
  - Tiles – will form seamless imagery
  - Color Balanced over project area
  - Selected Areas with mitigated building lean
    - 80/80 forward and sidelap
    - Spot shots on buildings over 20 stories

> Project at a glance — The Geospatial Experts

- **Digital Orthophotos:**
  - Tiles at 1"=100' map scale with 4 inch pixel
    - Meet ASPRS accuracy for 1"=100'
    - > 4.2 Terabyte (1000+ DVDs)
  - Tiles at 1"=200' map scale with 1 foot pixel
    - Meet ASPRS accuracy for 1"=200'
    - > 60 Gigabyte (15+ DVDs)

> Project at a glance — The Geospatial Experts

- **Contours:**
  - From LiDAR data acquisition (masspoints)
  - Photogrammetrically collected breaklines
  - Seamless
  - High accuracy at 2 foot and 5 foot interval
  - Cartographic pleasing product
  - Meet ASPRS accuracy requirements

> Deliverables

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The VARGIS Team deliverables will:

- Meet Specification and conform to Standards
- ASPRS, FGDC, NOAA, FEMA, NSSDA
  - 4 inch pixel orthos 1"=100' map scale
  - 12 inch pixel orthos 1"=200' map scale
  - 2 foot contours 1"=100' map scale
  - 5 foot contours 1"=200' map scale
- FGDC Metadata

> Deliverables

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- **Natural Color Digital Ortho Imagery**
  - ***Project Area #1 & #3***
  - 4 inch pixel orthos
  - ***Project Area #2***
  - 1 foot pixel orthos
- Format
  - Geo-TIFF (header tags to be confirmed)
  - JPEG 2000

> Deliverables

The Geospatial Experts

- **Near Infrared Imagery**
  - ***Project Area #1***
  - 4 inch pixel orthos
- Format
  - Geo-TIFF
  - JPEG 2000

> Deliverables

The Geospatial Experts

- **Contours with 5 foot interval**
  - **Project Area #2**
  - DTM mass points and breaklines
  - Generate TIN
  - Software generated
- **Format**
  - ArcGIS shapefile
  - ACAD drawing file

Acceptance Criteria

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- **Acceptance Criteria:**
  - Industry Standards
  - Accuracy Specifications
  - RFP
  - Response
  - New document approved by all parties
  - Approved prior to acquisition

Acceptance Criteria

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Acceptance Criteria:

- Measurable Criteria (errors, RMSE, spacing, etc. specifications)
- Interpretable Criteria (color, radiometry, smoothing, etc.)

- **Image Chips & Pilot Project**

- **Understanding between**
  - **LAR-IAC**
  - **Independent QA/QC Contractor**
  - **VARGIS Team**

Schedule

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- **Project Schedule Risks**
  - Bad weather conditions for long period
  - Independent QA/QC contractor selection delayed
  - QA/QC review periods extended
  - County provided information (Control, tile grid)

Schedule

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- **Project Schedule**
  - Redundancy of image sensor (DMC)
  - Redundancy of LiDAR equipment (ALS50)
  - Team Experience
  - Early mobilization to LA County
  - Extensive Resources
  - Project Planning
  - Based on Work Breakdown Structure (WBS)
  - All mandatory products delivered by 6/30/2006

VARGIS Communication Plan

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Communication Plan will document:

- How information will be collected and distributed
  - E-mail / telephone protocol
  - Meetings and conference calls
  - Formal documentation of information
- Methods to be used (who will get what information)
- LA County is the point of contact for all LAR-IAC members and public.
- Process for documenting changes (Project Change Control)
  - Project Scope
  - Project Schedule
  - Project Cost

Tracking Database

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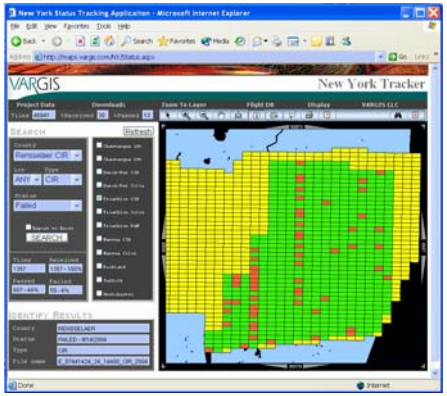
VARGISTracker Database

- Web Based project tracking
- Custom designed for LAR-IAC
- Password protected
- Updated daily as production tasks are completed
- Imagery and LiDAR acquisition updates within 36 hours of flight

Tracking Database

The Geospatial Experts

Query of Rensselaer County, NY for failed imagery on internal QC process.



Questions and Answers

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