GeoBase 101

Introduction to GeoBase Concepts

Lt Col Tom Laffey
HAF Geo Integration Office (AF/ILEI)

U.S. AIR FORCE
A GIS Links Graphical Features (Entities) to Tabular Data (Attributes)
GIS “Black Hole” Behaviors

- **T\text{Image}**
- **T\text{1}**
- **T\text{2}**
- **T\text{3}**
- **T\text{4}**
- **T\text{Present}**

**Data Stewardship**
- **Current Data**
- **Process Breakdown**
- **Obsolete Data**

**Ground Truth**
- **Base Imagery**
- **Weapons Safety**
- **Real Property**
- **Natural Resource Mgt**
- **Security Forces**

**Commander’s Situational Awareness**

**“Notional Maps”**

- **Sample**
One Installation...

Many Missions with GIS ‘Projects’
One Installation... Many Systems Needing a Map

- TBMCS-UL
- FPC2/IBDSS
- ACES
- CITS/CIPS
- ASHS
- IRPIMS

Versions:
- Map v 1.0
- Map v 2.0
- Map v 3.0
- Map v 4.0
- Map v 5.0
- Map v 6.0
One Installation…
Why Not Share a Map?

- Communications
- Civil Engineer
- Command & Control
- Environmental
- Safety
- Force Protection
One Installation...One Map

Command & Control

Communications  Weapons Safety  Airfield Managers  Logistics Plans  Bio Environmental Management  Security Police  Civil Engineers  Environmental Managers
Battlespace Intelligence
Parallels

Mission Specific Data Sets

Feature Data
Transportation
Vegetation
Drainage
Boundaries
Population
Elevation

Terrain Elevation Data
Imagery

WGS-84 Datum

Battlespace Geospatial Information & Services (GI&S)

Installation Geospatial Information & Services (IGI&S)

Feature Data
Transportation
Vegetation
Hydrography
Boundaries
Buildings

Terrain Elevation Data
Imagery

Local Datum

Mission Specific Data Sets
Assembling a New Information Culture

Mission Impacts

Information Resource

‘Process Change Pillars’

Information Resource Principles
GeoBase Objectives

Target Capability:
Attain and sustain a breakthrough capability enabling shared, efficient use of trusted integrated geo-referenced information delivering situational awareness across installations

Target Vision:
One installation… one map
GeoBase ‘Doctrine’

Value GeoBase resources as vital mission assets
Retain skilled, full-time manpower to lead the effort
Focus on culture change, not technology
Plan your GeoBase investment strategy
Evaluate current GeoBase assets before buying ‘new’
Adhere to USAF GeoBase architecture standards
Spiral your GeoBase development effort
Hold GeoBase data stewards accountable
Catalog your GeoBase data investment
Protect your GeoBase resources

USAF GeoBase Foundations
GeoBase Across the USAF Mission

Mission Impacts
Information Resource Process Change Pillars
Information Resource Principles

STRATEGIC INSTALLATION VISUALIZATION
GARRISON BASE MAPPING
SITE PLANNING
EXPEDITIONARY BASE MAPPING
DEPLOYED BASE

SIPRNet
NIPRNet

Information Resource
Process Change Pillars
Information Resource Principles

GeoBase Across the USAF Mission

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Information Resource
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Information Resource Principles

GeoBase Across the USAF Mission
Sustaining GeoBase
Mission Needs

Strategic Base Visualization
Garrison Base Mapping
Expeditionary Site/Base Mapping

Systems Architecture
Information Architecture

USAF GeoBase Foundations

Mission Impacts
Information Resource Principles
Process Change Pillars
Systems Architecture

- Sets IT standards for acquiring and deploying GeoBase capabilities

- The architecture will allow other IT systems to tap into GeoBase capabilities... more than 40 systems have expressed interest!

- AF Chief Information Officer (CIO) approved GeoBase Architecture in Oct 02 and re-distributed it to all MAJCOM CIOs

- Responds to the:
  - Clinger-Cohen Act of 1996, Information Technology Management Reform Act (ITRMA) and
  - Government Accounting Office (GAO) Report 02-6 of 2002, Enterprise Architecture Use Across the Federal Government can be Improved
Information Architecture

Pillar

Information architecture includes:

- Imagery
- Data
- Metadata
- Applications

Imagery architecture published Sep 03
- Satellite Imagery sources/handling
- Airborne Imagery sources/handling
## Spatial Data Standard for Facilities, Infrastructure, and Environment

<table>
<thead>
<tr>
<th>Entity Sets</th>
<th>Entity Classes</th>
<th>Entity Types</th>
<th>Attributes</th>
<th>Domains</th>
</tr>
</thead>
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<tr>
<td>26</td>
<td>181</td>
<td>1,006</td>
<td>25,844</td>
<td>21,542</td>
</tr>
</tbody>
</table>

Utilities ➔ Water System

- Natural Gas
- Wastewater ➔ Drain Sump
  - Grease Trap
- Septic Tank ➔ Capacity
  - Age
  - Composition ➔ Concrete
    - Fiberglass
    - Steel

**SDSFIE Example:**

Septic Tanks
Integrated Situational Awareness

CIP is shared widely across the base LAN.

Functional communities generate fused installation pictures with CIP and select MDS in functional IT solutions.

MDS are stored, where possible, with the CIP and are shared on a need-to-know basis as determined by functional data steward.

CIP is shared widely across the base LAN.
Exploiting One GeoBase ‘Service’

Centrally-Managed, Functionally-Specific Automated Information Systems (AIS)

GeoBase Application (e.g., Base Map Viewer)

GeoBase-Enabled System
- e.g. ACES

GeoBase-Enabled System
- e.g. TBMCS-UL

GeoBase-Enabled System
- e.g. ASHS

GeoBase Service

CIP / MDS
Sizing the Garrison

CIP Footprint

Dependent on Installation Mission Site & Situation

- Anti-Terrorism/Force Protection
- Critical Infrastructure Protection
- Urban Encroachment
- Accident Potential Zones
- Noise Contours
- Common Civil-Military Concerns
- Installation Commander Approval
Information Technology
Can’t Do It Alone

USAF GeoBase Mission Needs

USAF GeoBase Foundations
USAF GeoBase Program

Mission Impacts

Information Resource Principles

Systems Architecture

Financial Management

Policy & Guidance

Education & Training

People & Workflow

Information Architecture

USAF GeoBase Foundations
Financial Management Pillar

- Develop Formal Programming Strategy for GeoBase
- Link GeoBase Investments to POM
- Annual Cycle
- Investment Discipline Emphasized
- Enables Rapid GeoBase Alignment with Enterprise Architecture
**GeoBase Investment Phases**

**GeoBase Management Reviews Held Jan-Mar 03**
- Compliance with GeoBase CONOPS & Architecture
- Low Risk, High Return with Expeditionary Priority
- Conservative, Achievable, Sustainable Strategy
- Challenge New Application Development
- Seek Fiscal Economies of Scale

**Controlling GeoBase Investments**
- GeoBase Website Provides Latest Updates
- Monitor GeoBase Inventory Via Website
- GeoBase Policies Guide Investments
- Quarterly Investment Reports
- Worldwide Monthly Telecons
- Portfolio Management
- GIS Software Inventory
- Accountability is the Aim

**Evaluating GeoBase Investments**
- Annual GeoBase Management Review
- Assess Expected Versus Real Impacts of Architecture
- Identify Necessary Investment Plan Changes
- Revise GeoBase Investment Management Process Based on Lessons Learned
Policy and Guidance Pillar

- **GeoBase CONOPS**
  - Interim version published Jan 02
  - Version 2.0 published June 03 (GeoBase Website)

- **GeoBase Architecture**
  - Sets IT standards for acquiring, deploying, and assuring common GeoBase capabilities
  - The Common Installation Picture (CIP) is the focal component
  - Version 1.0 distributed 10 Jan 03 across ALMAJCOM GIO/CIO
  - Version 1.1 to be distributed Dec 04

- **GeoBase Policy Memo**
  - AF/CV Memo – May 01
  - AF/IL Memo -- Key Responsibilities – Oct 02
    - Coordinated through AF CIO with AF/IL signature
    - Policy memo tasked ALMAJCOM/DRUs to “implement a strategic planning process to guide GeoBase investment
  - AFCS/SECAF Memo:
    “All AF Installations Mapping to be GeoBase Compliant” -- Dec 03
Education and Training

Pillar

Education and Training Venues Underway

- GeoBase Integrated into 3E5X1 Tech Training (Ft Leonardwood)
- Defense Mapping School incl Expeditionary Site Mapping (Ft Belvoir)
- Silver Flag, Eagle Flag Ex Sites Expose Prime BEEF to GeoBase Tools
- GeoBase Concepts Shared in AFIT Civil Engineer Courses
- US Air Force Academy – In Curriculum and Field Exercises
- AF SNCOA/ABC/On-Scene CC Course/SOS (working)
- ANG Regional Trainers (6 Sites)

Outreach Sessions with Private Sector Companies Ongoing (eg. ESRI)
Greatest Challenge Today Given Manpower Turbulence
- Outsourcing and Privatization
- Downsizing of Military Forces
- Civil Service System Not Responsive to Needs

Intent is to Assimilate GeoBase Capabilities
- Near-term solution requires outsourced contract support
- Mid-term goals include government assuming more responsibilities

Civil Service Program Becoming Engaged
- Precedents for Civil Service GeoBase Managers Exist
- HAF GIO Seeking to Aggressively Expand Opportunities
- Civilian GS Series Core Docs Completed (GS-14, 13, 12, 11, 9)
- XP Coordination and approval process for Civilian and FTE positions
Expeditionary GeoBase

- Expeditionary GeoBase provides forward operating locations with vital situational awareness
- Intelligence, logistics and civil engineer sectors teaming to better plan forward base layouts
- More than 200 forward sites have been mapped by GeoReach teams in the Combat Air Forces
- Expeditionary Site Mapping (ESM) Conops Approved by Gen Jumper, Apr 04
Traditional employment of geospatial technologies for mapping AF major installations

Unprecedented service-wide program acknowledging the unique value of geospatial information resources

Critical training ground for expeditionary basing

“One installation… one map… forward & rear!!”
**Strategic GeoBase**

**Background**

- The Jan 02 Origins
- Driven by AF Secretariat (I&E)
- BRAC 2005 Requirements
  - Originally Included 91 Major Bases
    - Lower 48 States
    - Hawaii and Alaska
      - Guam
    - Expanded to Worldwide Scope in Feb 03
  - Unprecedented Geospatial Technology Initiative
Strategic GeoBase

Data Layers – 9 Each

- Reqts Shaped by BRAC 2005
- Commercial Satellite Imagery
  - Base Boundary
  - Range Complex Boundary
- Noise Contours (DNL 65+ db)
- Accident Potential/Clear Zones
- Explosive Safety Arcs
- Floodplain (100 year)
- Wetlands
- Range Complex Airspace

- Visualization = Situational Awareness
MAJCOM GIOs Guide Acquisition and Sustainment of Common Installation Pictures Per GeoBase Architecture For All USAF/DOD Missions
**GeoBase Integration Strategy**

| HQ PACAF GIO | FOA GeoBase Contractor Teams with Functional IT Implementation Staff to Interface with GeoBase Architecture |
| HQ ACC GIO | |
| HQ AMC GIO | |
| HQ AFMC GIO | |
| HQ USAFE GIO | |
| HQ AFRC GIO | |
| HQ AFSPC GIO | |
| HQ AETC GIO | |
| HQ ANG GIO | |
| HQ AFSOC GIO | |
| HQ USAFA GIO | |
| 11th WG GIO | |

**AF/XI** | **AF/XOF** | **AF/XIC** | **AF/ILE** | **AF/ILE**
---|---|---|---|---
| TBMCS - UL... | FP/C/BDSS... | ASHS... | CITS/GCSS... | ACES... |
| IRPIMS... | C2 | ATM/FP | SAFETY | COMM | CIVIL ENGR | ENV MGT |
| AFC2ISRC GIO | AFSFAC GIO | AFSC GIO | 38EIG GIO | AFCESA GIO | AFCEE GIO |
GeoBase Integration

Strategy

MAJCOM and FOA GIOs
Team to Implement an Enterprise GeoBase Capability IAW Architecture

C2
SECURITY
SAFETY
COMM
CIVIL ENGR
ENV MGT

AF/XI
AF/XOF
AF/SE
AF/XIC
AF/ILE
AF/ILE

C2
AF2ISRC GIO
SECURITY
AFSFC GIO
SAFETY
AFSC GIO
COMM
38 EIG GIO
CIVIL ENGR
AFCESA GIO
ENV MGT
AFCEE GIO
Geo Integration Office Organizational Chart

HQ USAF GIO (HAF GIO)
- Policy and guidance
- GeoBase Enterprise Architecture
- Program oversight and requirements
- Program investment strategy

MAJCOM/DRU GIOs
- Guide acquisition and sustainment of GeoBase capabilities across respective installations
- Program for GeoBase resources
- Installation/DRU GIOs
  - Maintain the CIP and GeoBase service
  - Coordinate MDS maintenance with functional communities

FOA GIOs
- Discover functional requirements for exploitation of GeoBase capabilities
- Assist functional communities to interface mission processes and IT solutions with GeoBase capabilities
GeoBase Compass Headings

A bi-monthly report from LtCol Tom Laffey, Interim Chief, HAF GIO

At the upcoming third annual GeoBase Compass Conference, 15-19 August, there will be a variety of educational workshops, information briefings, and MAJCOM breakout sessions for all of our Air Force Geospatial team members to attend. In particular, we have provided specific times at the beginning of the conference for the separate MAJCOMs to meet prior to all of the education briefings/workshops, in order to smartly select the right mix of attendance at each of the sessions for their MAJCOM/Base GIO team members. Additionally, we have added many educational workshops to focus on training and sustainment of the Common Installation Picture (CIP) for the geospatial experts in the career field, as well as many classes on specific Mission Data Set (MDS)
Compass Conference Flow

- GeoBase Orientation -101
- GeoBase Workshops/Seminars
- GeoBase and DISDI Plenary Sessions
  - MAJCOM Sessions
  - Vendor Workshops/Exhibits
GeoBase 101

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