

The background of the slide is a topographic map of the Earth, showing the Americas and surrounding oceans. The colors range from dark blue for deep ocean trenches to green and yellow for lowlands, and brown and red for high mountain ranges and plateaus. The EarthScope Project logo is centered at the top, with the word "earth" in a white serif font, "scope" in a larger white serif font where the "o" is a globe, and "PROJECT" in a smaller, spaced-out, orange sans-serif font below it.

earth
scope
PROJECT

EarthScope Plate Boundary Observatory Status Update

Greg Anderson

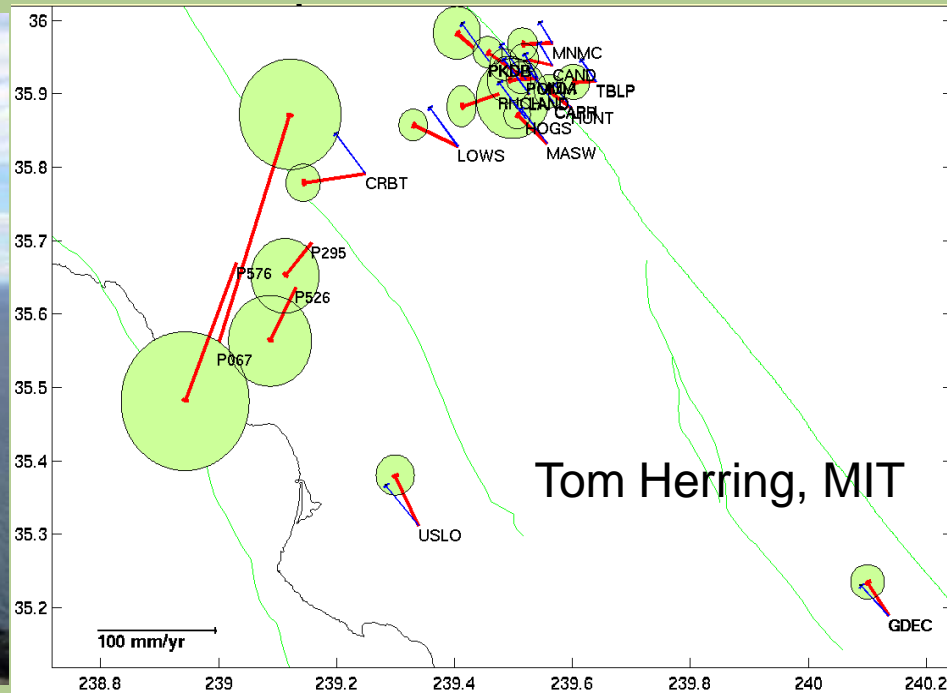
PBO Data Products Manager

CORS Users Forum, Fort Worth, TX

26 September 2006

Topics

- What is the Plate Boundary Observatory?
- Network operations/construction status
- Data management
- Web tools
- Real-time progress/plans





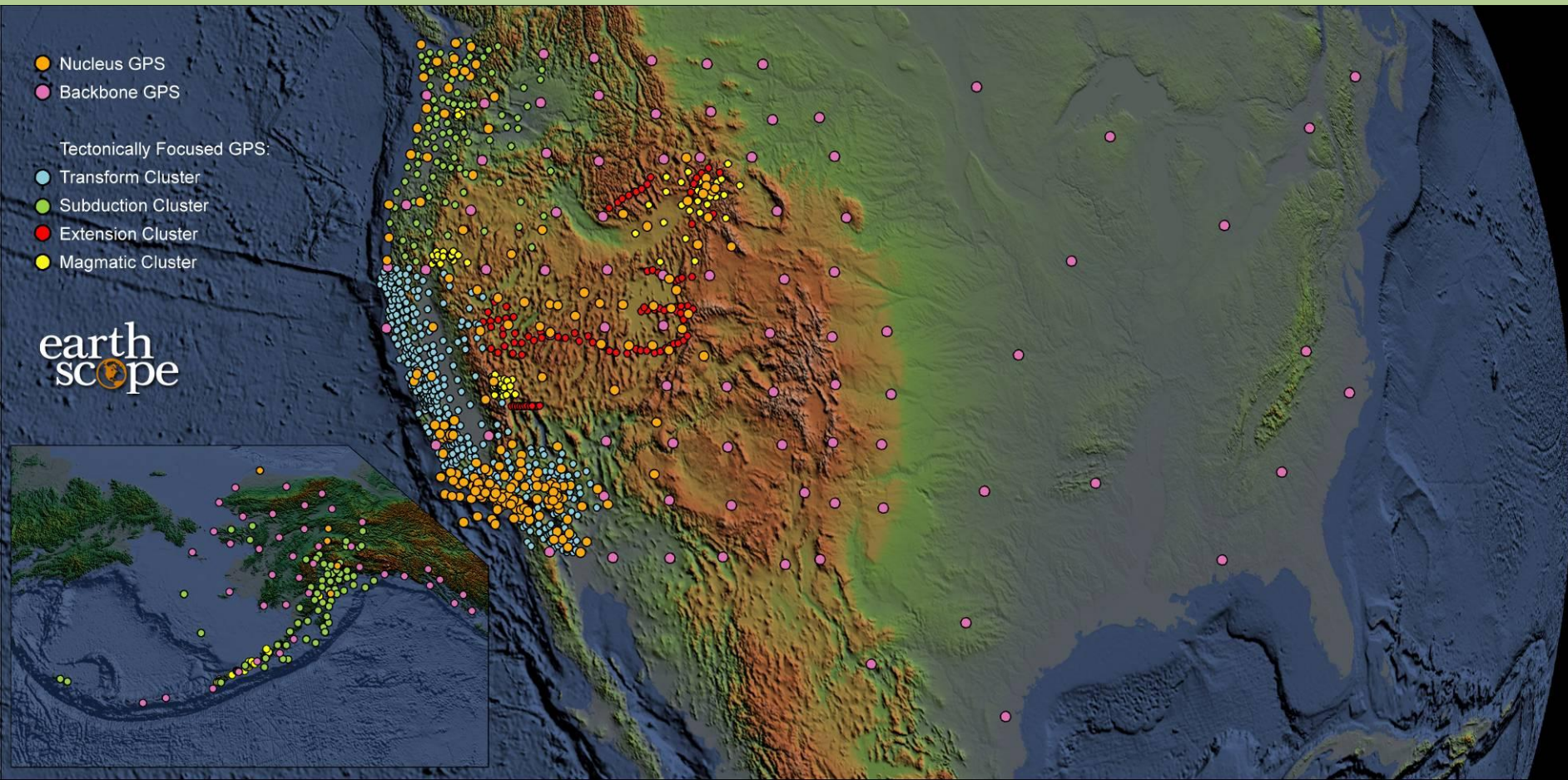
What is PBO?

- Geodetic component of EarthScope, installed and operated by UNAVCO and funded by the National Science Foundation.
- Install & run large network to study:
 - Earthquake processes & seismic hazards
 - Magmatic processes & volcanic hazards
 - Active deformation & tectonics
 - Continental geodynamics

PBO GPS Network

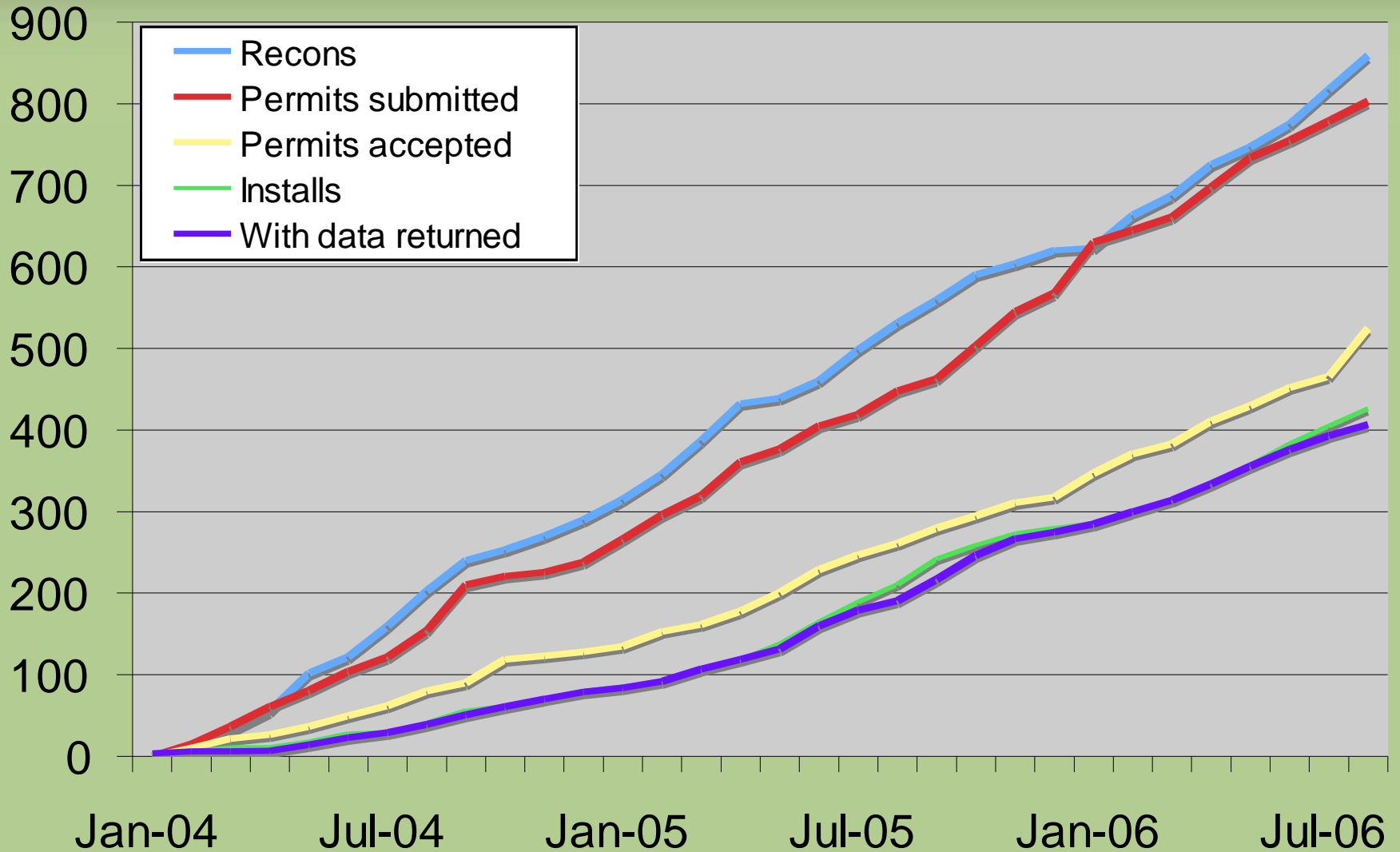
852 new stations 209 existing stations

100 survey-mode receivers



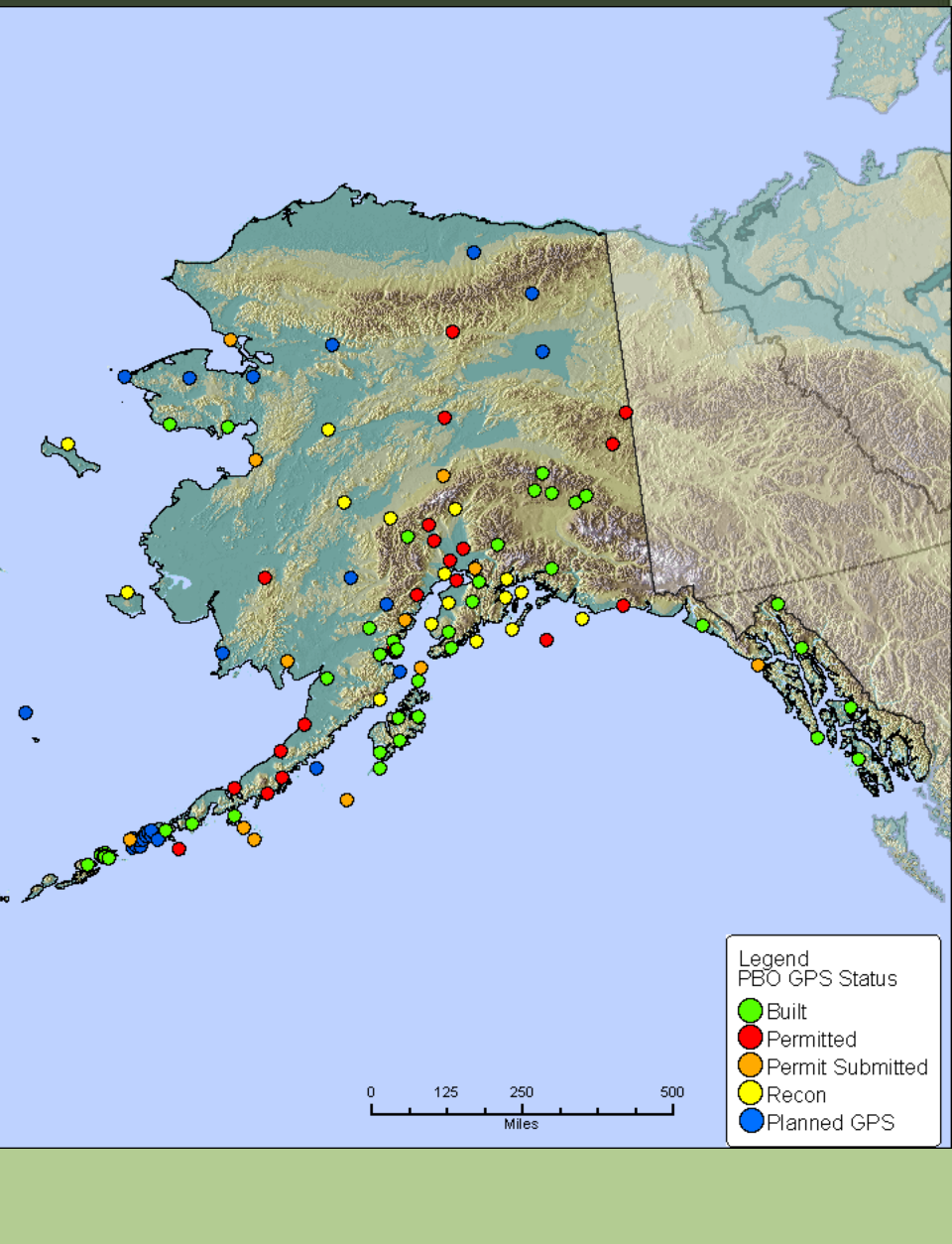
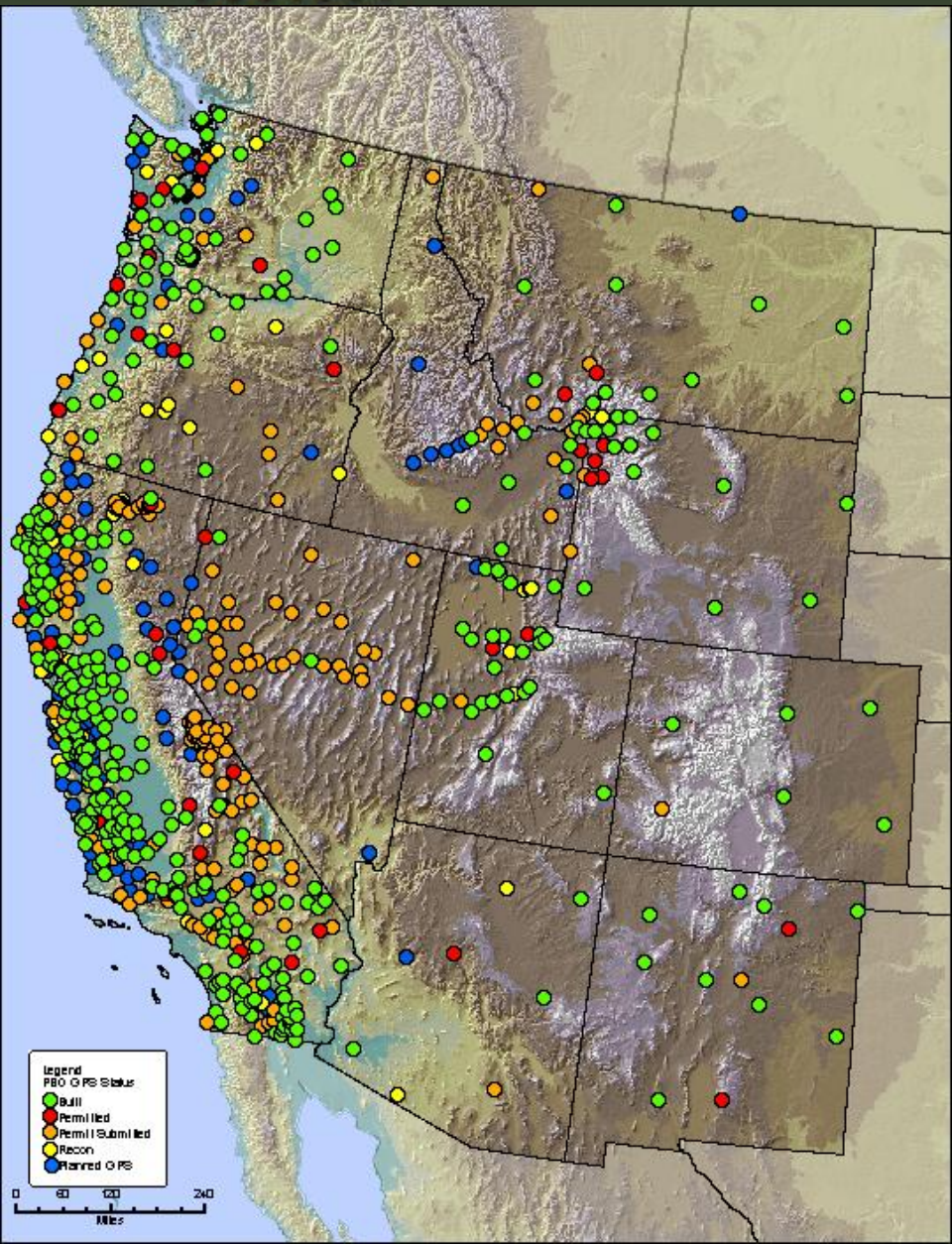


PBO GPS: Halfway Done



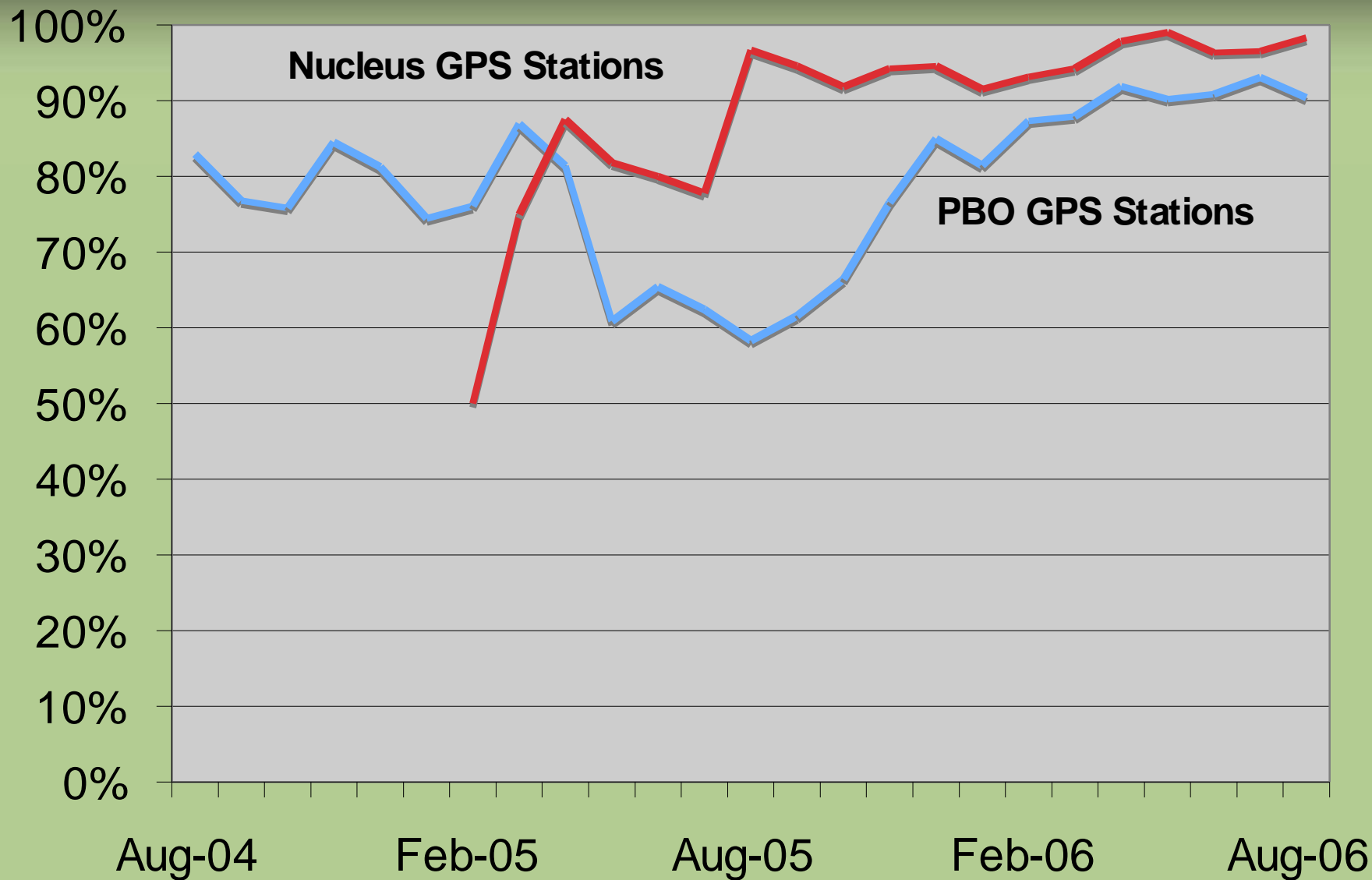


PBO GPS: Halfway Done



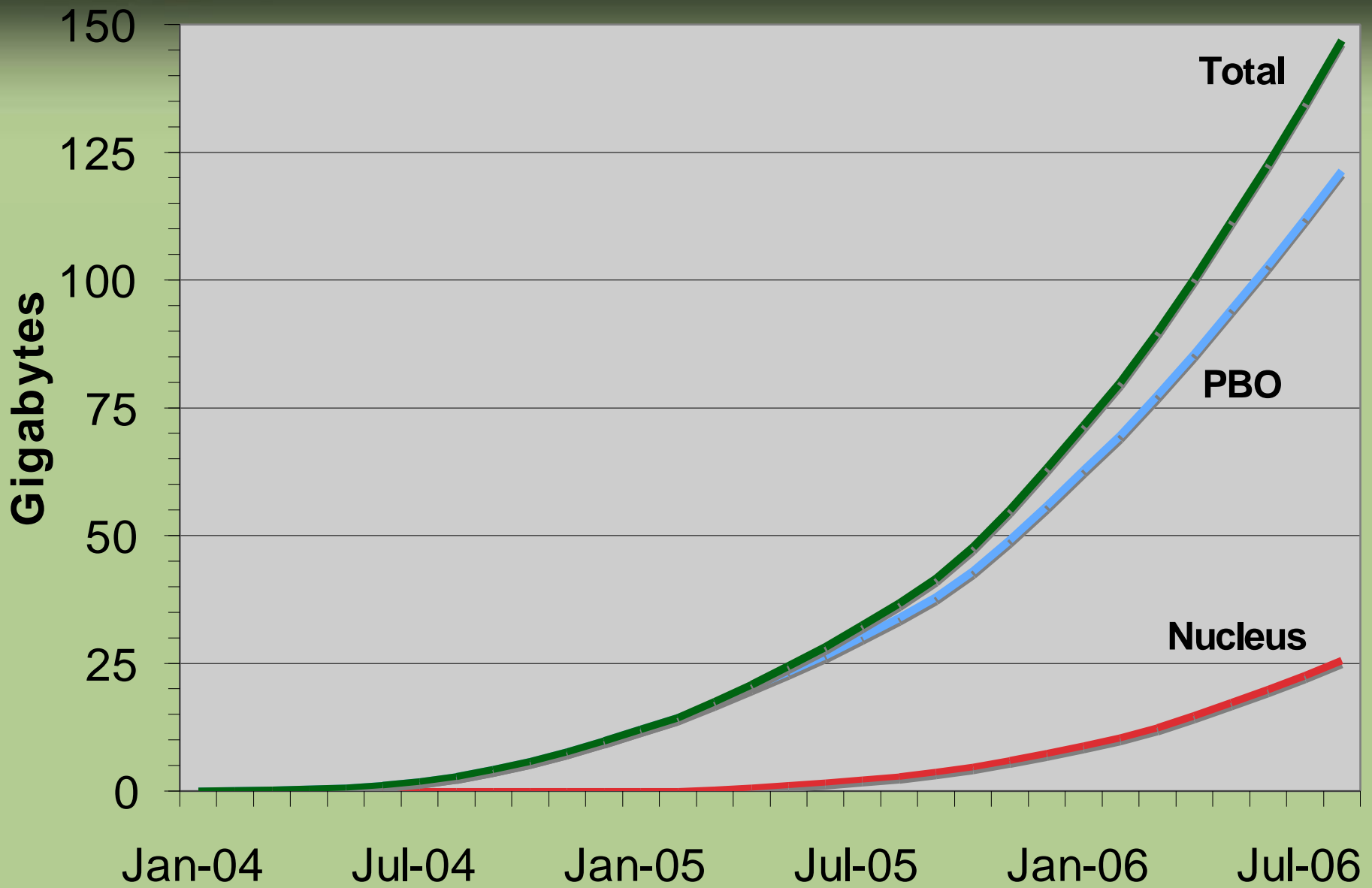


GPS Operational %

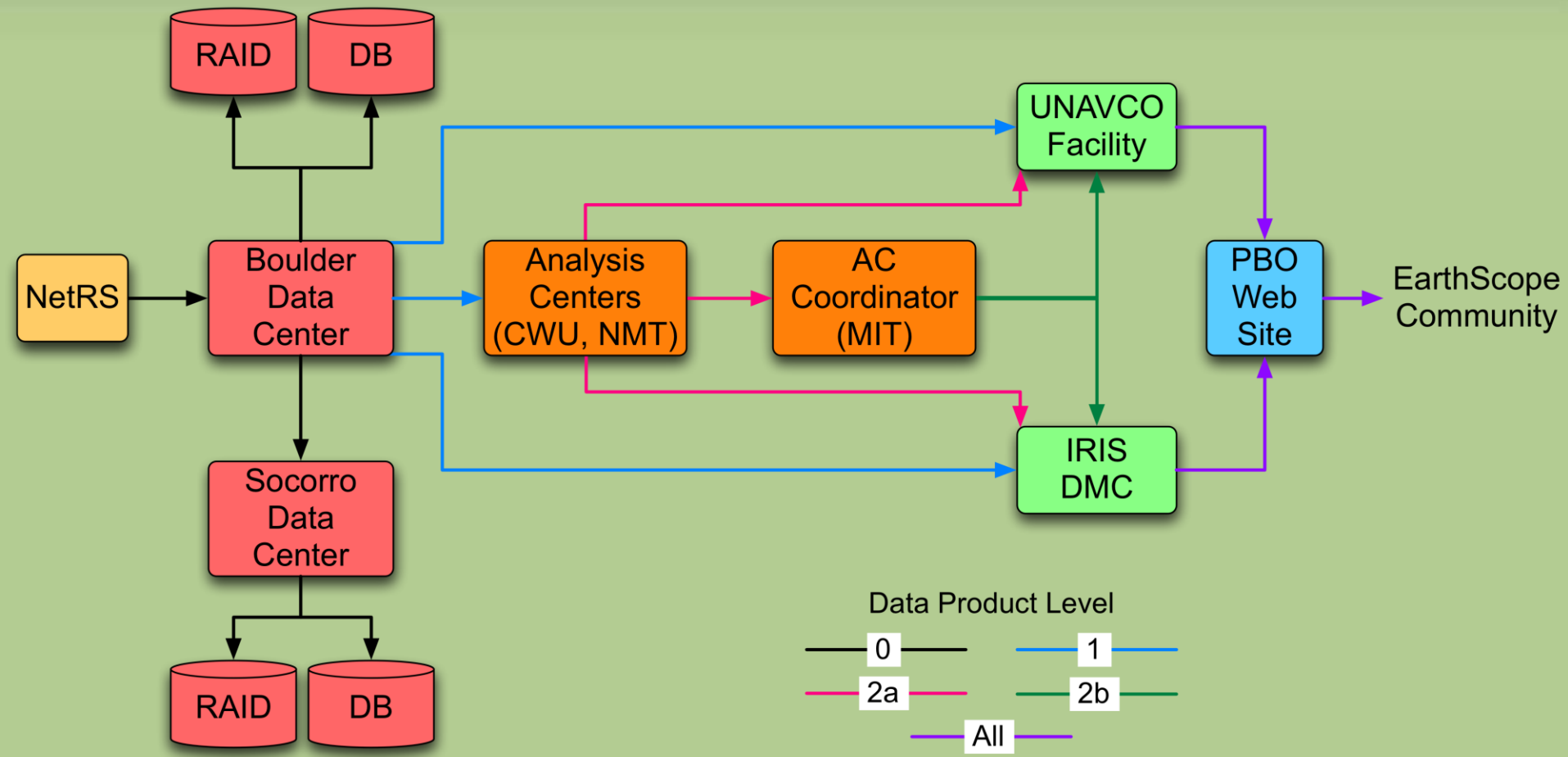




Raw GPS Data Volume



Current GPS Data Flow





PBO GPS Data Products

Less

P
r
o
c
e
s
s
e
d

Level 0 (at least daily)

- 15-sec raw, routine download
- 5-sps raw, triggered download
- Survey-mode raw files

Level 1 (automated QC @ PBO HQ)

- 15-sec, 5-sps, survey-mode RINEX

Level 2 (1-, 15-day and 1-yr latencies)

- Individual AC position solution
- Individual AC processing input and output files
- Combined position & velocity solutions & time series (ACC)
- Combined baseline time series (ACC)
- Coseismic offsets (ACC)

Archived at UNAVCO Facility, IRIS DMC

More



Which stations are built/planned?

UNAVCO: Plate Boundary Observatory (PBO)

http://pbowmsdev.int.unavco.org/shared/scripts/mapping/status_map.shtml

UNAVCO About Us Contact Us Support Search Facility PBO

UNAVCO Plate Boundary Observatory Supporting EarthScope Geodetic, Seismic, and Tectonic Research earthscope PROJECT

PBO Site Status Map

Legend

X: -178.21
Y: 36.976

Map Navigation and Info

- About PBO
- GPS Operations
- Strainmeter Operations
- Data Management
- GPS Data Products
- Strain Data Products
- Publications and Reports
- Education and Outreach
- News and Announcements
- Procurement and Purchasing
- GeoEarthScope
- EarthScope GPS Campaigns
- PBO Nucleus
- PBO Internal

Advanced Search Site Map Find

http://pboweb.unavco.org/status_map



Which stations are operating?

UNAVCO: Plate Boundary Observatory (PBO)

http://pbowmsdev.int.unavco.org/shared/scripts/mapping/soh_map.shtml

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PBO Network State of Health Map

Legend

X: -148.16
Y: 23.728

Advanced Search Site Map Find

http://pboweb.unavco.org/soh_map



Tell me more about station X

UNAVCO: Plate Boundary Observatory (PBO)

http://pboweb.unavco.org/stations/?checkkey=P066&groupstype=1


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UNAVCO Plate Boundary Observatory

Supporting EarthScope Geodetic, Seismic, and Tectonic Research

UNAVCO » Plate Boundary Observatory »

P066 - HOMEPAGE

| | | |
|---|---|--|
|  | 4-Char P066 | Latitude, Longitude 32.617, -116.170 |
| | Station Name JacumbaAp_CS2004 | Elevation 820 m / 2690 ft |
| | Station Status Station Built | Monument Type Deep |
| | Project PBO | Location (City, State) Jacumba, CA |

» [Main Album](#)
» [Installation Album](#)

Geological Summary
Not Available

Additional Information
Not Available

Summary
Region: SCAL
Station Installation Date: 2004-08-07 00:00:00

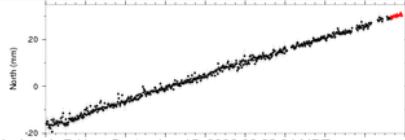
Monument
Monument Installation Date: 2004-08-07 00:00:00

Equipment
Receiver Installation Date: 2005-12-06 00:00:00-07
Receiver Model: TRIMBLE NETRS
Receiver Firmware Version: 1.1-2
Receiver Configuration File: Not Available

Antenna Installation Date: 2004-08-07 00:00:00-06
Antenna Model: TRM29659.00
Antenna Serial Number: 0220335642

Comms Serial: 4420233962
Comms UNAVCO ID#: 15390
Comms Summary: At this time the CDMA modem is not installed due to poor cell reception. A V-stat modem is being considered for the site. At this time manual down loads are being done. This will be a real-time network prototype site where we will be working with SCRIPPS and the county to provide real-time data while fulfilling requirements of the PBO

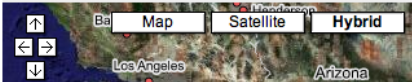
Data Products



Updated: Friday, September 15, 2006 06:22:34 MDT
» [Time Series Plots](#)
» [Raw Data Access](#)
» [Download Rapid Time Series](#)
» [Download Final Time Series](#)
» [Additional Data Products](#)

Education and Outreach
Not Available

Station Map



Map Satellite Hybrid

Advanced Search Site Map Find

M 4.9, Kuril Islands

http://pboweb.unavco.org/stations/P067



How do I get data?

pbweb.unavco.org/gps_data

pbweb.unavco.org/stations/gps

UNAVCO: Plate Boundary Observatory: Data Management and Information Technology: GPS Products

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Plate Boundary Observatory

Supporting EarthScope Geodetic, Seismic, and Tectonic Research

UNAVCO > Plate Boundary Observatory > Data Management and Information Technology >

GPS PRODUCTS

> [Documentation](#)
> [Station Homepage Index](#) (Find out more about F...)

Raw (Level 0/1) Products

The PBO GPS network will consist of 852 continuously o...
collected by these stations are available at the UNAVCO...
these stations are available in standard IGS site log form...
You can access these products using the links in the tab

| | |
|---------------------|---------------------|
| Trimble T00 Format | RINE |
| FTP | FTP |

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Plate Boundary Observatory

Supporting EarthScope Geodetic, Seismic, and Tectonic Research

UNAVCO > Plate Boundary Observatory >

PBO NETWORK STATION INDEX

GPS

- [PBO GPS](#)
- [Nucleus GPS](#)
- [US Array GPS](#)
- [Mt. St. Helens GPS](#)
- [Center for Earthquake Research and Information](#)
- [Louisiana State University GPS](#)

> [Back to Station Index Page](#)

PBO GPS - (432 stations)

| Dot# | Station Name | St |
|------|------------------|----|
| AB06 | FalsePass_AK2005 | St |
| AB07 | SandPoint_AK2004 | St |
| AB11 | Nome_ArvilAK2006 | Pe |
| AB15 | Nyac_Gold_AK2006 | St |
| AB21 | AdaKIAleuAK2006 | St |
| AB22 | IllimnaHPAK2006 | St |
| AB28 | Rainy_PassAK2006 | St |
| AB36 | Manley_HotAK2006 | St |
| AB37 | Paxon2__AK2004 | St |
| AB42 | Akwe_Peak_AK2006 | Pe |
| AB44 | SkagwayUSCAK2005 | St |
| AB48 | portalexanak2005 | St |
| AB49 | KlawockAirAK2006 | St |

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Plate Boundary Observatory

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Processed (Level 2) Products

PBO has two GPS Analysis Centers at Central Washing...
Center Coordinator at MIT, that process raw GPS data fr...
range of GPS data products, including position solutio...
PBO GPS Processing Plan and the Preliminary Design P...
You can access these products using the links in the tab

| | |
|---------------------------------------|--|
| Product | Central Washing... GPSY Analysis |
| SINEX by GPS Week | FTP |
| Phase RMS Data by GPS Week | FTP |
| Position Time Series by Station | FTP |
| Position Time Series for all Stations | Rapid (tar.gz) Final (vel) |
| Network Velocity Field | Final (vel) |

Special Products

- [Augustine Volcano](#) - (Time Series and Plots) - (ta...
Time series for stations near Augustine Volcano, KOD1, and SELD.

UNAVCO: Plate Boundary Observatory (PBO)

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Plate Boundary Observatory

Supporting EarthScope Geodetic, Seismic, and Tectonic Research

UNAVCO > Plate Boundary Observatory >

P066 - HOMEPAGE

| | | | |
|----------------|------------------|------------------------|------------------|
| 4-Char | P066 | Latitude, Longitude | 32.617, -116.170 |
| Station Name | JacumbaAp_CS2004 | Elevation | 820 m / 2690 ft |
| Station Status | Station Built | Monument Type | Deep |
| Project | PBO | Location (City, State) | Jacumba, CA |

> [Main Album](#)
> [Installation Album](#)

Geological Summary

Not Available

Additional Information

Not Available

Summary

Region: SCAL
Station Installation Date: 2004-08-07 00:00:00

Monument

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Data Products

Updated: Friday, September 15, 2006 06:22:34 MDT

- > [Time Series Plots](#)
- > [Raw Data Access](#)
- > [Download Rapid Time Series](#)
- > [Download Final Time Series](#)
- > [Additional Data Products](#)

Education and Outreach

Not Available

Station Map

pbweb.unavco.org/stations/XXXX



Special Data Request Tool

UNAVCO: Plate Boundary Observatory (PBO)

http://pboweb.unavco.org/shared/scripts/datarequests/

Janine UNAVCO Apple Weather News Morning CPR Webmail SCOUT Gmail

UNAVCO: Plate Boundary Observat...

and Tectonic Research

DATA REQUESTS

Use the following form to request data from the Plate Boundary Observatory (PBO).

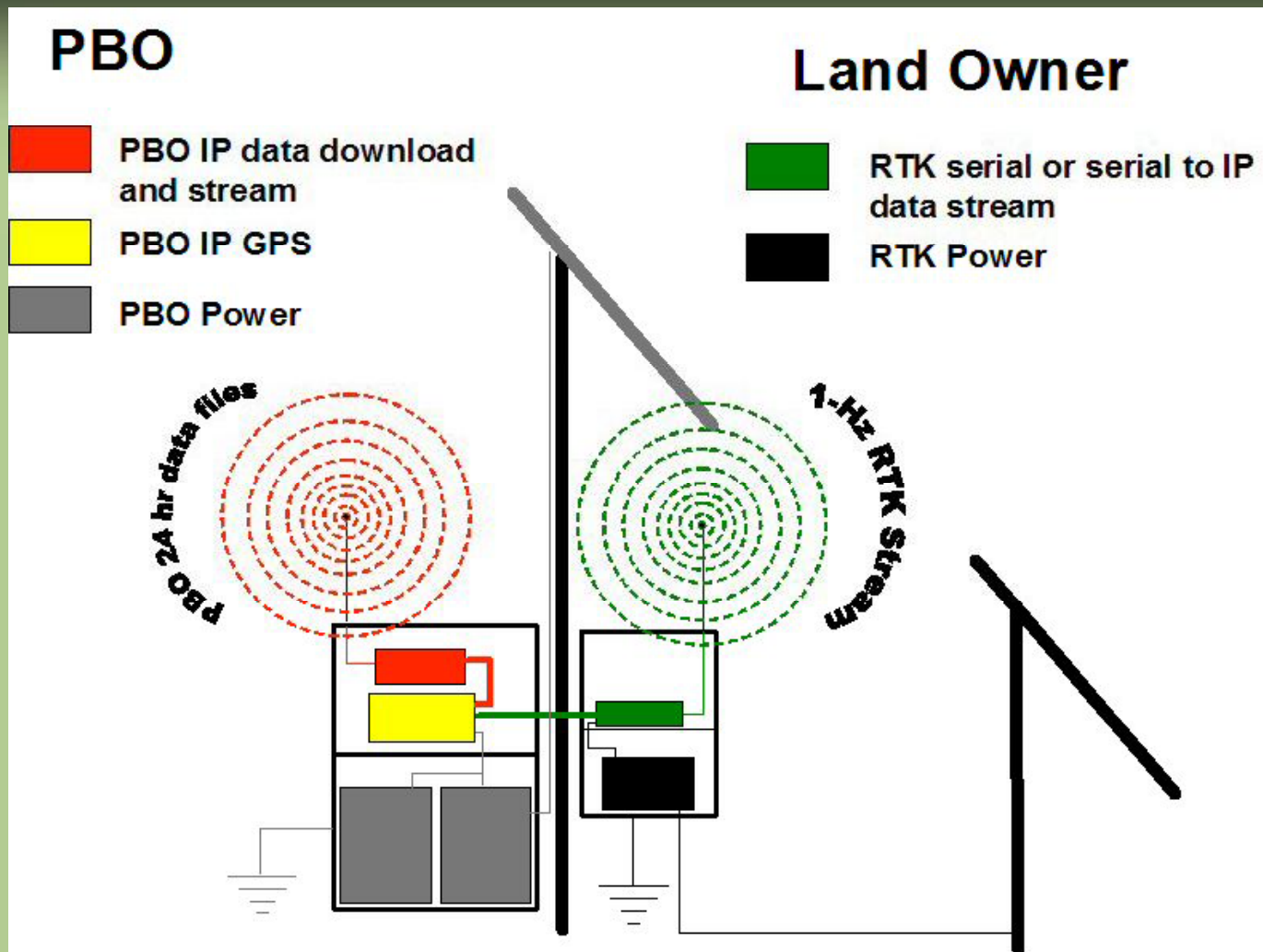
| | |
|--------------------------|--|
| Name (First and Last): | Daffy Duck |
| Email Address: | d.duck@disney.com |
| Telephone: | 888-555-1212 |
| Role: | Project Principal Investigator Other Role: <input type="text"/> |
| Institution: | Disneyland |
| Data you are Requesting: | Quack! |
| Source of Funding: | Secret gold reserves |
| Data Start Date: | 2005-10-02 <input type="text"/> YYYY-MM-DD |
| Data End Date: | 2005-10-08 <input type="text"/> YYYY-MM-DD |

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PBO Operations
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Data Management
Publications and Reports
Education and Outreach
News and Announcements
Procurement and Purchasing

Advanced Search Site Map
 Find

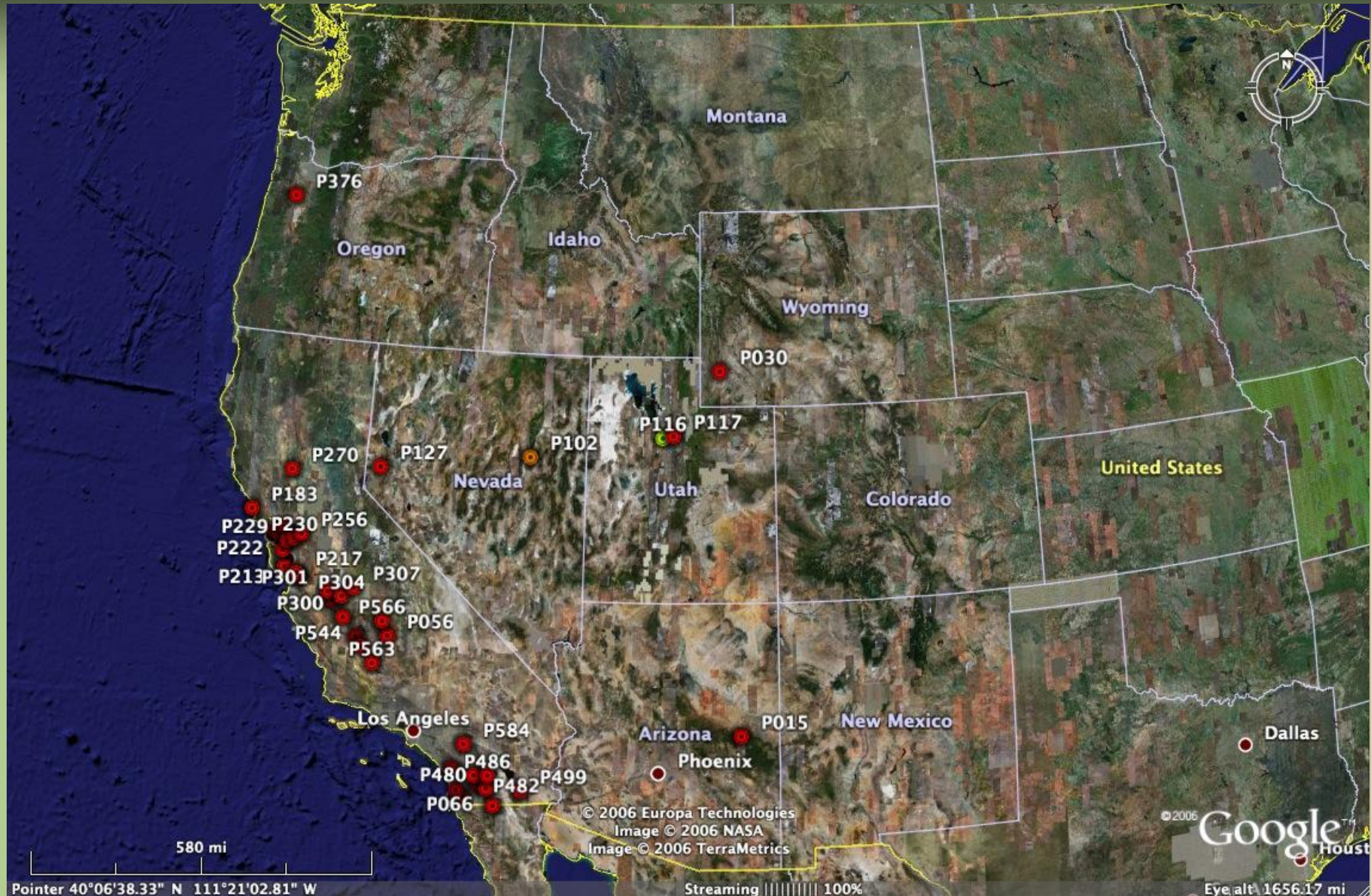
http://pboweb.unavco.org/data_request

PBO RTK for Landowners



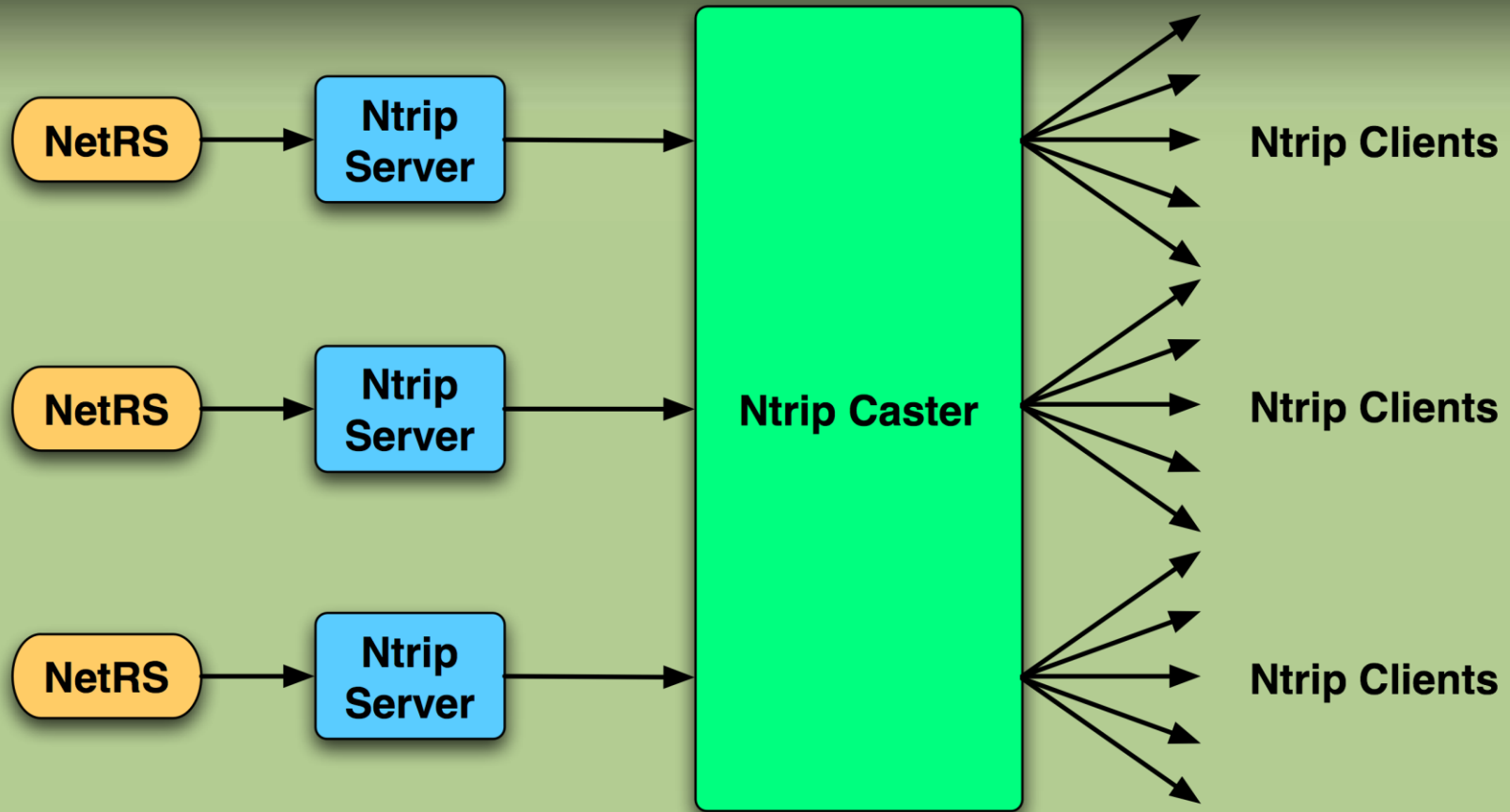
Generally, PBO can provide access to RTK feeds for landowner
Request during permitting process

RTK Stations (Planned/Active)





IP-based real-time via Ntrip



Prototype testing with interested groups

Contact me at anderson@unavco.org or 303-381-7555



Summary

- PBO is geodetic component of EarthScope project
- Network Operations Status
 - Half of 852 new CGPS have been installed
 - Typically, 90+% operational
- Data Management Status
 - 96% of stations have returned data
 - ~150 GB raw data (Jan 2004-present) available
 - Special data requests: http://pboweb.unavco.org/data_request
- Real-Time Data Progress & Plans
 - RTK feeds now available to landowners, 40 active/planned
 - Prototype Ntrip IP-based real-time system available for testers



For more information...

<http://pboweb.unavco.org>

www.earthscope.org

UNAVCO: Plate Boundary Observatory (PBO)

Janine UNAVCO Apple Weather News Morning CPR Webmail SCOUT

UNAVCO: Plate Boundary Observat...

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earth scope

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- Data Management
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- Education and Outreach
- News and Announcements
- Procurement and Purchasing

Extension Site Selection Working Group Convenes in Tucson to Discuss PBO Basin & Range GPS Site Locations
Date Posted: Feb 08, 2005 Date of Activity: Feb 03, 2005 - Feb 04, 2005

A well defined and timely action plan recommendation is the result of a two-day Extension Working Group meeting held in Tucson, Arizona. Led by Rick Bennett, chair of the working group, the committee discussed the prioritization and possible re-location of planned GPS sites in the Basin & Range region. Made up of scientists familiar with the Basin & Range region, the group discussed where stations should be installed to capture the most significant and scientifically relevant data to best meet the EarthScope project goals. A formal statement summarizing the committee's recommendations will be submitted to PBO management. This document will be available online after it is released.



During the two-day meeting, the Extension Working Group came up with several recommendations for site relocations in order to best achieve EarthScope science goals. From left to right: Wayne Thatcher, Bill Hammond, John Oldow, and Geoff Blewitt.
[Click to Enlarge]

» [More Details](#)

» [Station Installation Updates](#)

» [News and Announcements](#)

PBO Network Status Updates
February 1, 2005

Click on the image to the right to see enlarged maps of the Alaska and Lower 48 regions.

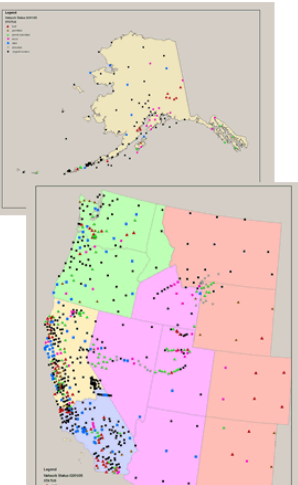
» [More Network Status Updates](#)

» [PBO Internet Map Server \(ArcIMS\)](#)

PBO Quick Contacts

- » [Data Products](#)
- » [Operations](#)
- » [Information Technology](#)
- » [Website Questions/Comments](#)
- » [Education and Outreach](#)
- » [General PBO Questions/Comments](#)

» [More Contact Information](#)



EarthScope Homepage

UNAVCO Apple News Weather Yahoo! Morning

EarthScope Homepage

Exploring the Structure and Evolution of the North American Continent

What is EarthScope?

Current Status

Data Portal

Educational Opportunities

Meetings/Workshops

Instrumentation Systems

- Drilling (SAFOD)
- Geodetic (PBO)
- Seismic (USARRAY)

Image Gallery

News

Publications

Contact Information


Project Management

- Project Change Request
- Internal Site (login required)

NSF National Science Foundation

EarthScope is sponsored by the National Science Foundation and conducted in partnership with the US Geological Survey.


EarthScope Visits Augustine Volcano



EarthScope is installing seven short-drilled braced GPS stations in and around Augustine Volcano to better characterize magma plumbing systems, dynamics of intrusive and eruptive processes, volcanic unrest, and eruption prediction.

Click here for [more information and daily updates](#).

San Andreas Fault Drilling Update



Drilling of the borehole into the San Andreas Fault began on June 11, 2004 and is currently about halfway through the activities planned for this year. Cuttings were collected and photographed at regular intervals; real-time mud gases were monitored; and distinct anomalies were observed in several shear zones. A number of other scientific activities have been going on at the site in real-time, including a seismic imaging experiment using drill-bit energy. On July 29th, an intermediate target depth of 4740' was reached with the planned hole diameter of 17 1/2". At this point a suite of scientific activities were carried out (geophysical logging, coring, fluid sampling and stress measurements). The hole has been cased with 13 3/8" casing and drilling has resumed.

Click here for daily updates and photos.

Job Announcement: Education and Outreach Manager

EarthScope invites applications for the position of EarthScope Education and Outreach Manager at the EarthScope Headquarters Office in Washington, DC. The successful candidate will be responsible for coordinating the development of a high-profile education program for EarthScope that emphasizes the integrated nature of the project and the importance of EarthScope's research initiatives.

Click here for additional information.

Announcements & Events

- Sept. 15-17, 2004: Rocky Mountain EarthScope Workshop I (Socorro County, NM)
- Oct. 8-9, 2004: EarthScope Workshop - SAFOD Sample Analysis (San Jose, CA)
- Nov. 7-10, 2004: EarthScope Exhibit Booth at Geological Society of America Annual Meeting (Denver, CO)