

The Plate Boundary Observatory: GPS Operational & Data Status

Greg Anderson

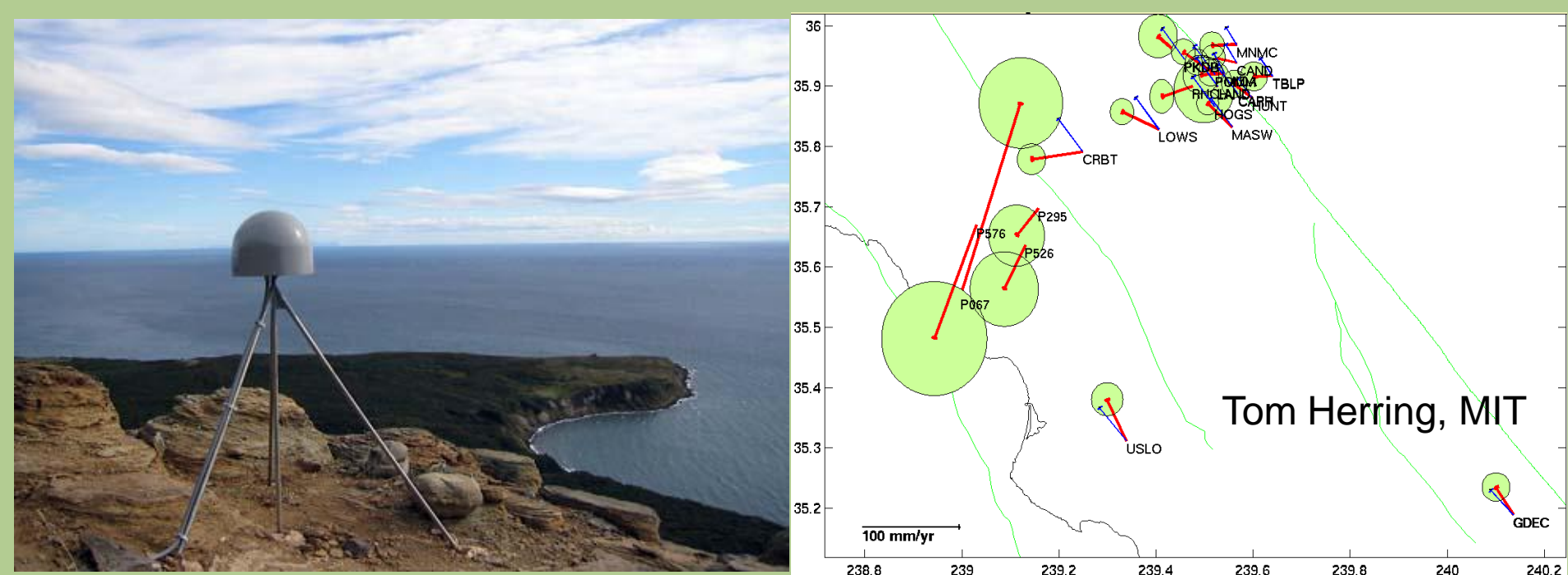
PBO Data Products Manager

anderson@unavco.org

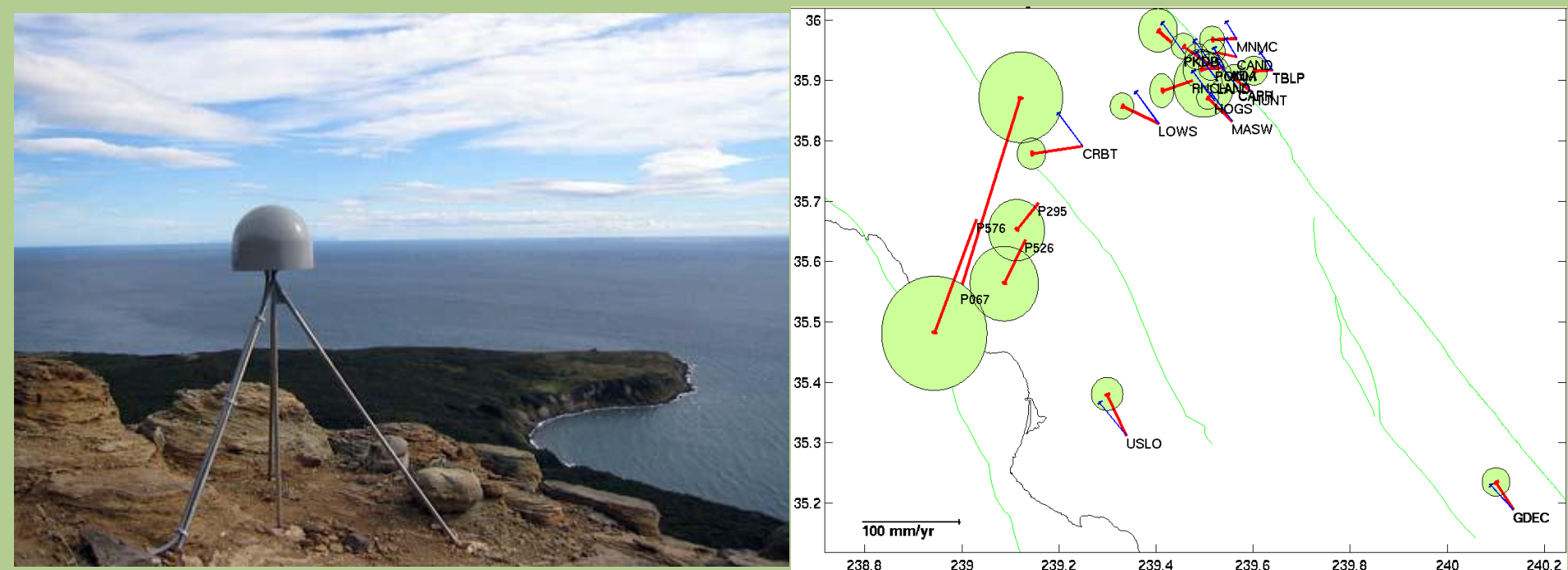
CORS Users Forum, 21 Sep 2004



- What is the Plate Boundary Observatory?
- Network Operations/Construction Status
- Data Management Status



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- Data Management Status



What is PBO?

- Geodetic component of NSF-funded EarthScope project
- Install & run large geodetic network to study:
 - Earthquake processes & seismic hazards
 - Magmatic processes & volcanic hazards
 - Active deformation & tectonics
 - Continental geodynamics

PBO Network Design

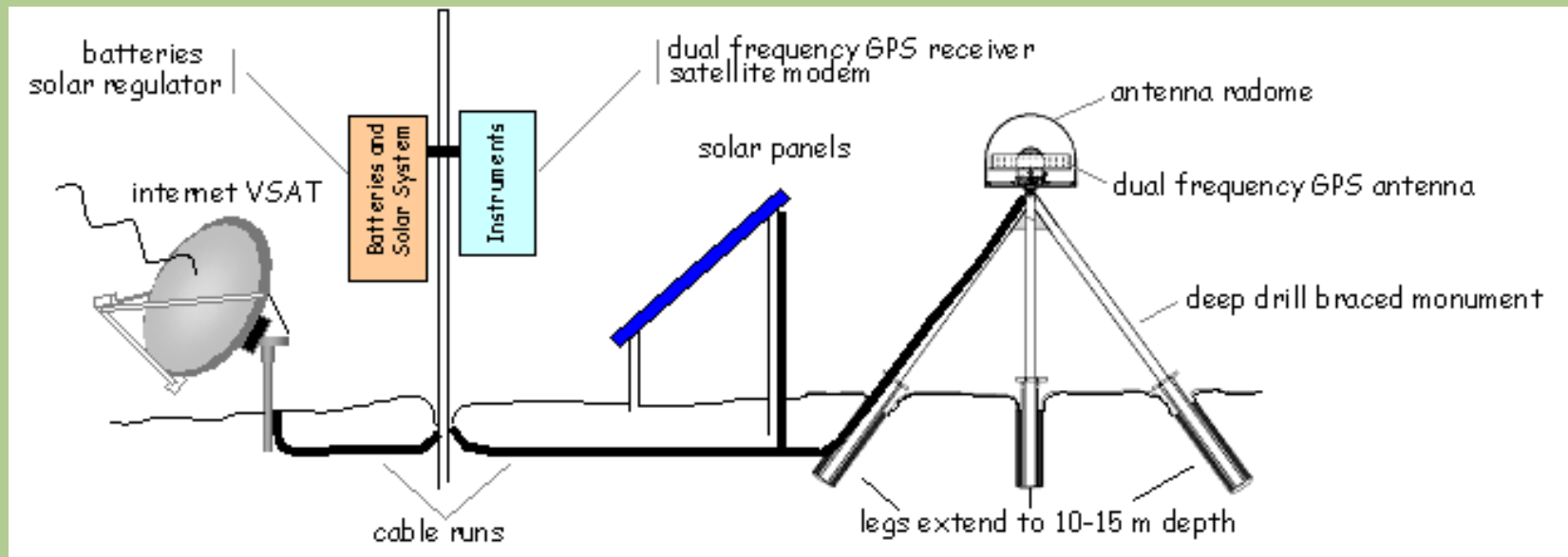
- 875 new CGPS stations
 - 225 existing CGPS stations
 - 100 SGPS receivers
 - 143 BSM stations
 - 5 LSM stations
-
- Year 1 goals:
 - 50 installed CGPS stations
 - 1 installed BSM station



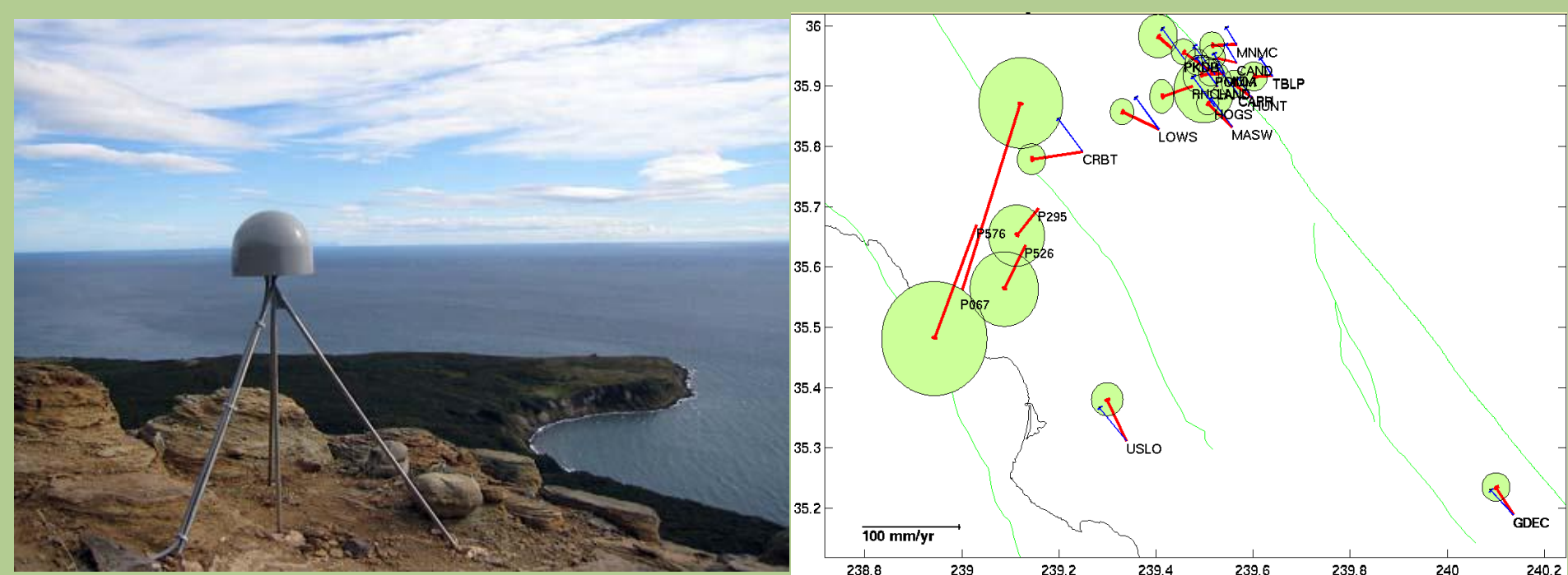


GPS Instrumentation

- Trimble NetRS receivers and choke-ring antennas
- SCIGN-type deep- and shallow-drilled monuments
- Solar/wind DC power, AC where possible
- IP-based data comms over CDMA, VSAT, Internet radio, etc.



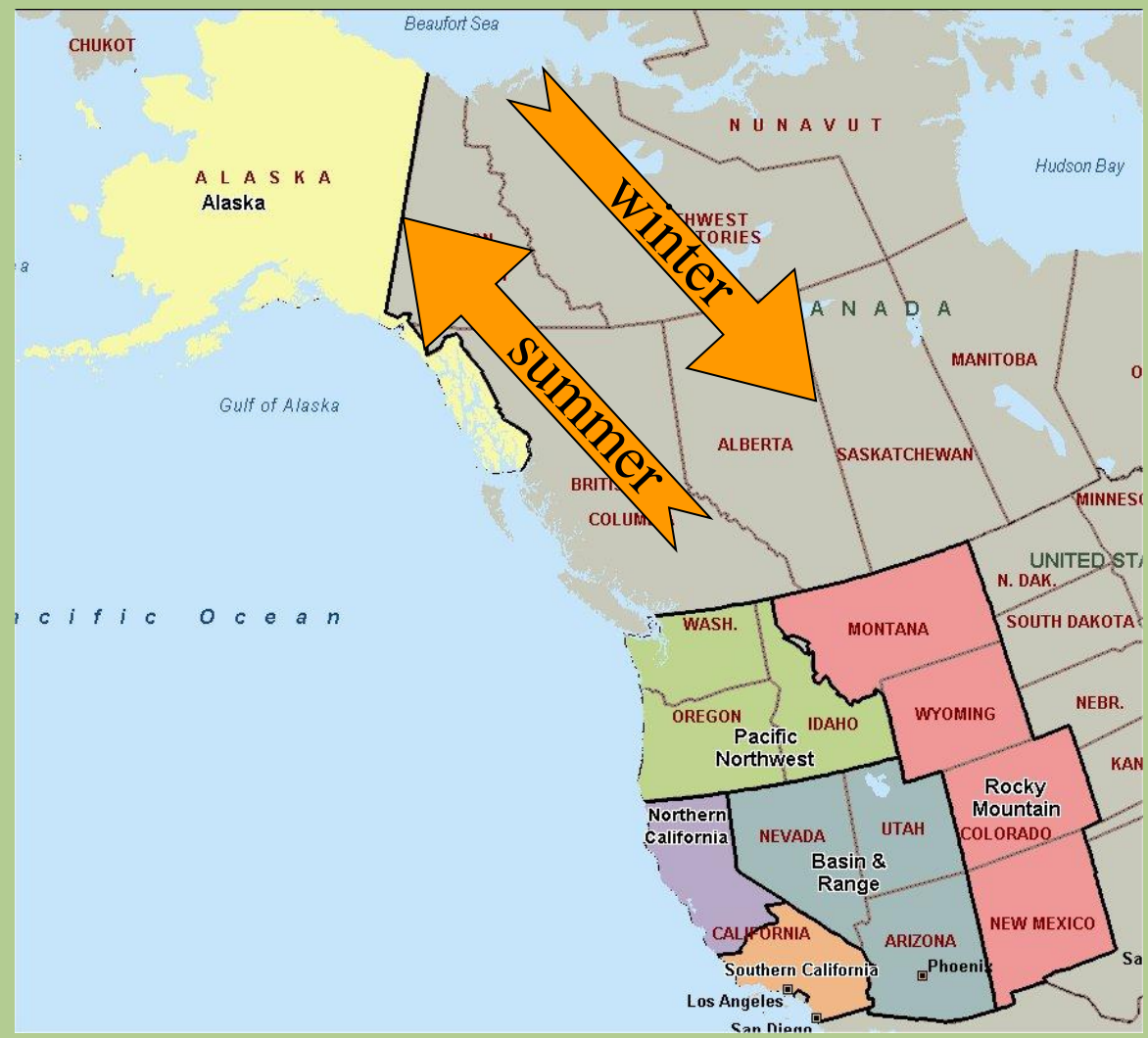
- What is the Plate Boundary Observatory?
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PBO Regions

- Project broken down into 6 regional offices.
 - Rocky Mountain
 - Basin & Range
 - Pacific Northwest
 - Northern California
 - Southern California
 - Alaska
- Use UNAVCO Facility engineers, when available.
- Installations occur simultaneously in all regions





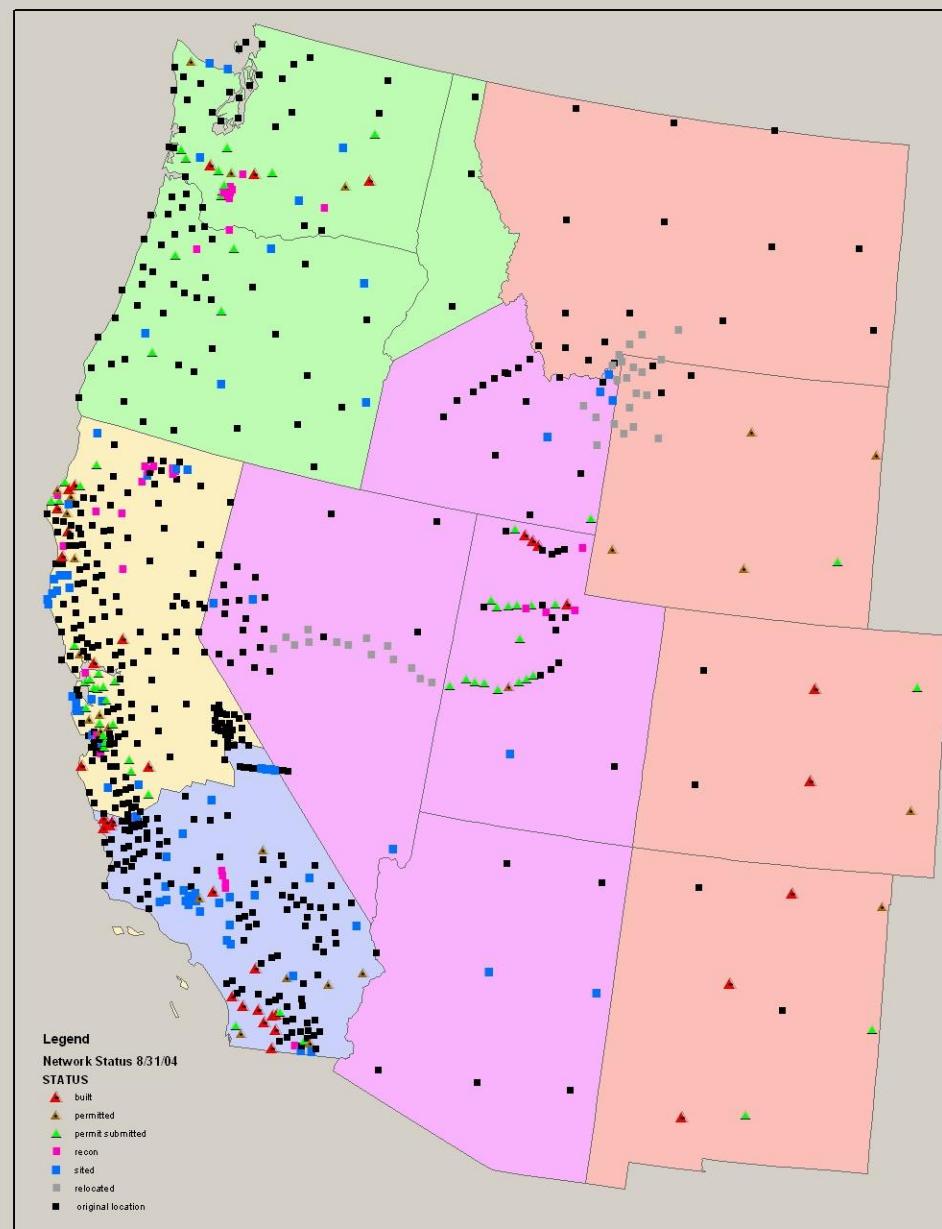
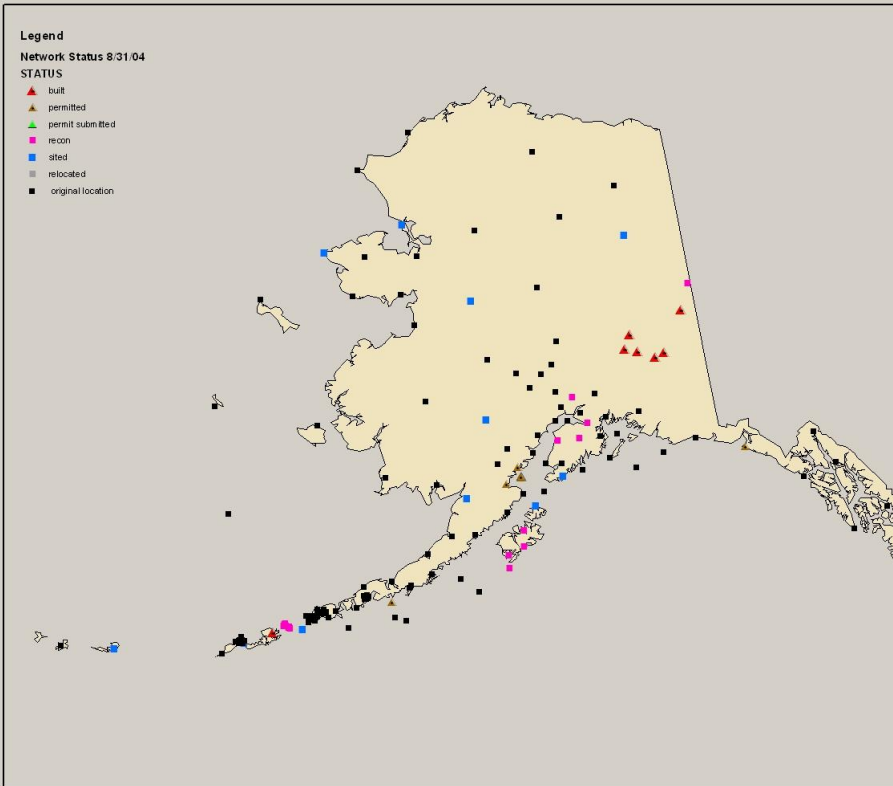
Network Progress: 21 Sep 2004

Preliminary station locations identified	342
Final station locations identified	203
Permits submitted	154
Permits accepted	80
Monuments installed	48
Data available	29
Routine archiving	22

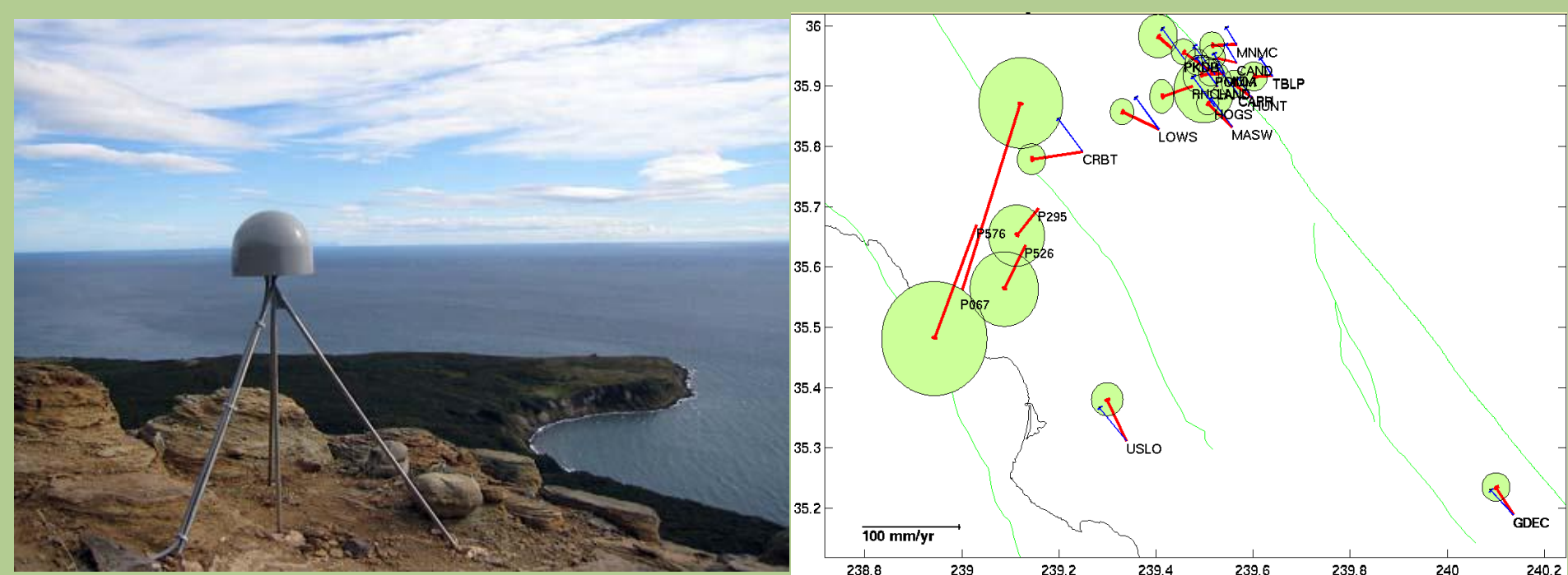




Status Maps: 1 Sep 2004



- What is the Plate Boundary Observatory?
- Network Operations/Construction Status
- Data Management Status



Data Management Overview

- Data Status
 - 29 of 46 stations have returned data
 - 22 stations archived routinely
 - Others lack comms or have comms problems
 - Data for Jan-Sep available via GPS archives
- Data Analysis
 - 2 Analysis Centers & 1 GPS AC Coordinator
 - Data products: position & velocity solutions, time series, etc.
 - Archived at GPS Archives
 - All products available from Archives & EarthScope Data Access System
- Data Management
 - Data Management web site: <http://pbo.unavco.org/data>
 - GPS ACs/ACC RFPs in final review

PBO GPS Data Products

Less

Level 0: Raw data & Metadata

- 15-sec, 24-hour BINEX files, at least daily download
- 5-sps BINEX, triggered download
- 1-sps real-time BINEX & RTCM, where possible

Level 1: Processed data

- GPS position solution
- Processing input & output files
- Created by 2 ACs, TBD

Level 2: Derived quantities

- Combined position & velocity solutions
- Position & baseline time series
- Coseismic offsets
- Created by ACC, TBD

Level 1 & 2: 3-day, 15-day, 6-month latencies

Archived at PBO GPS Archives

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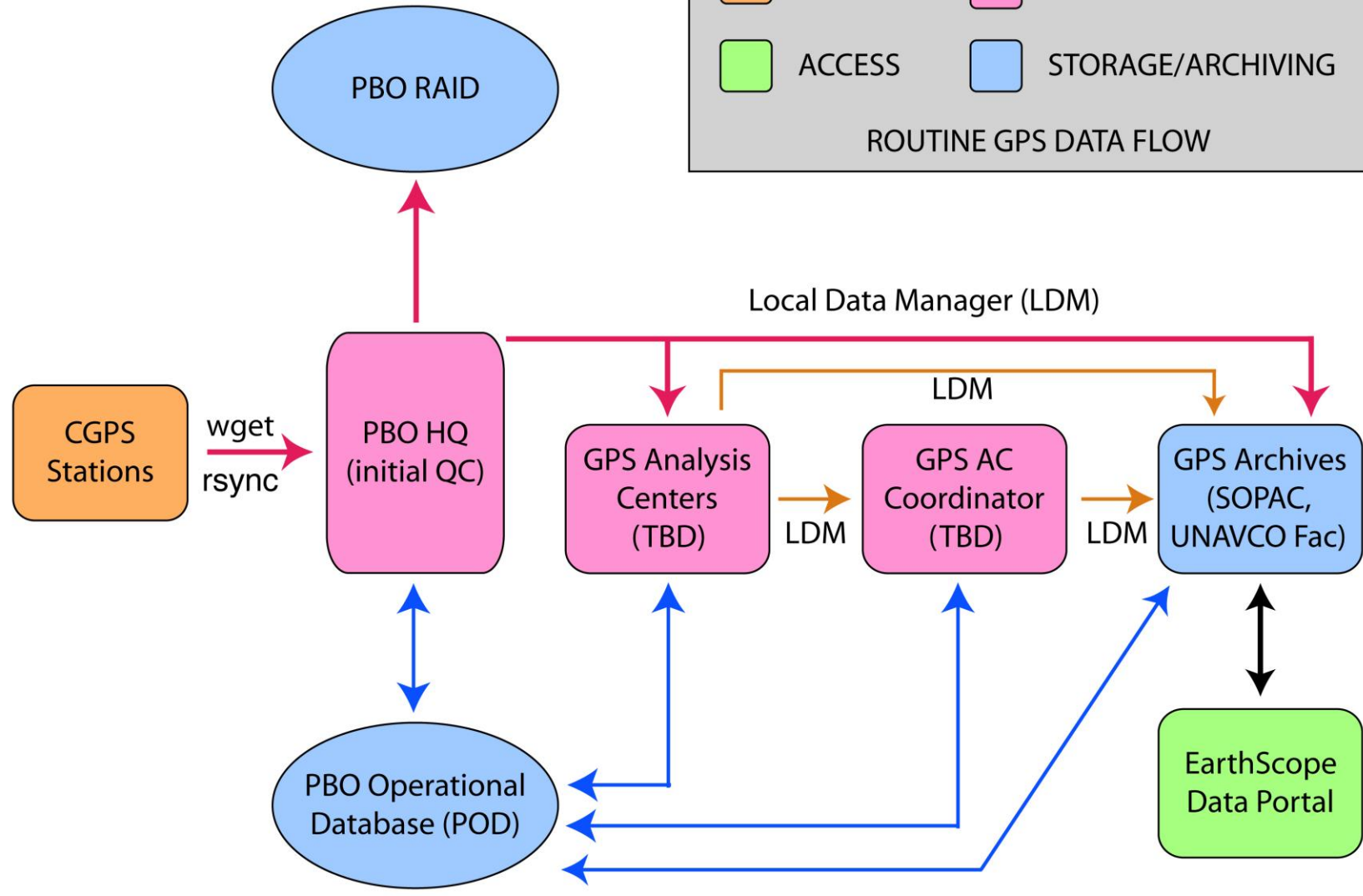
More



GPS Data Flow

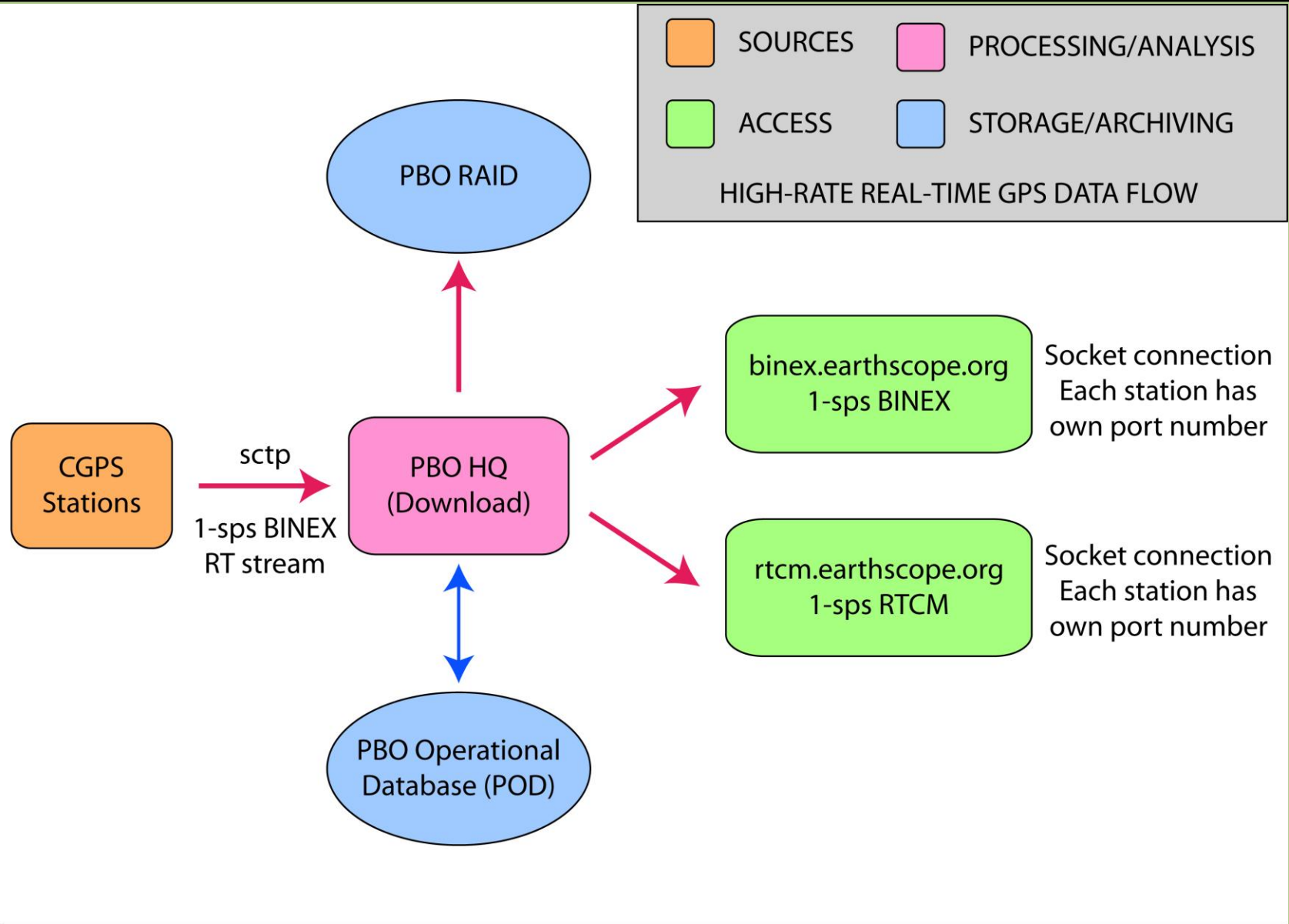
	SOURCES		PROCESSING/ANALYSIS
	ACCESS		STORAGE/ARCHIVING

ROUTINE GPS DATA FLOW



	RAW DATA		METADATA		DERIVED PRODUCTS		ALL DATA
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High-rate RT GPS Data Flow



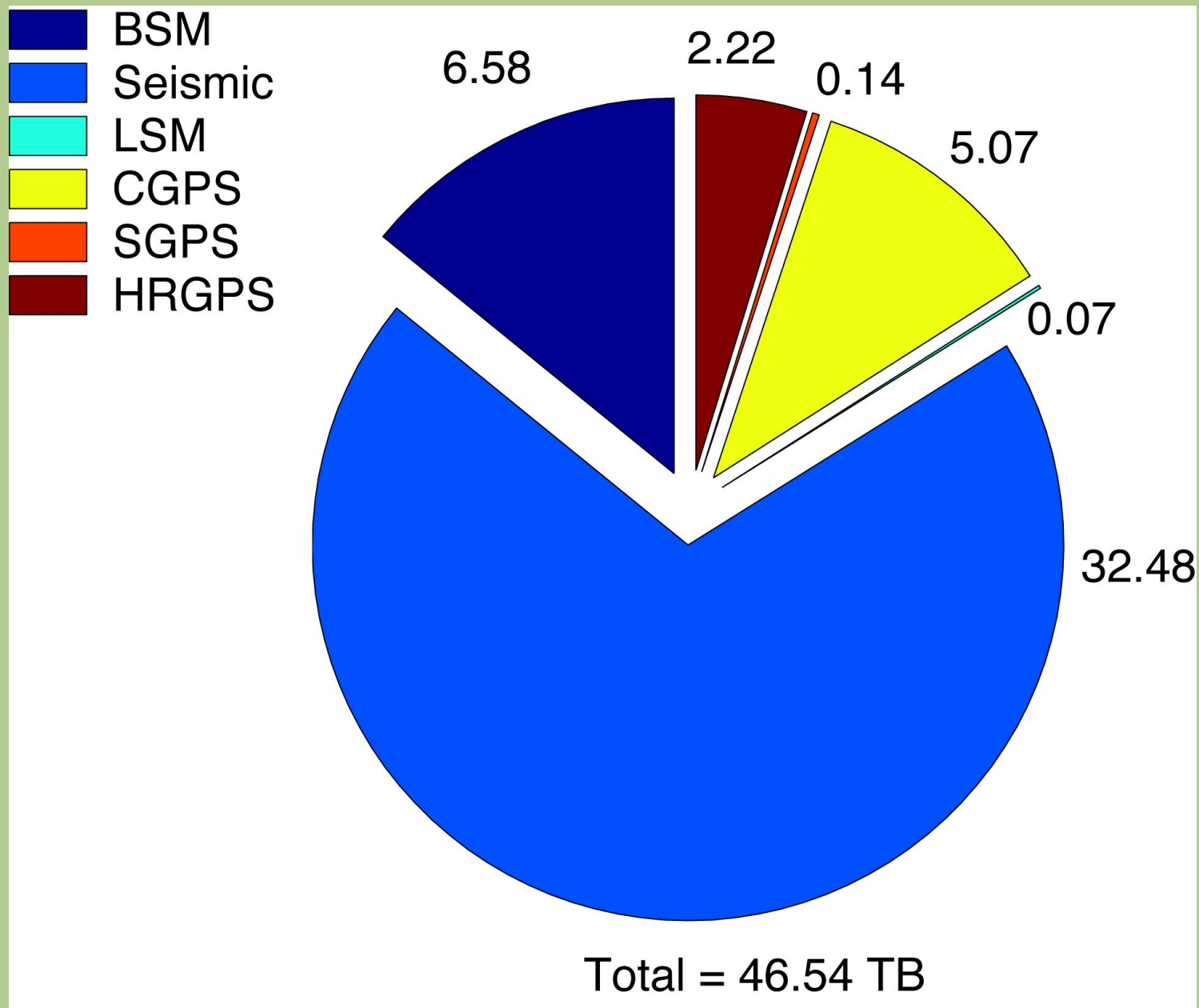
Legend for data flow types:

- Orange box: SOURCES
- Pink box: PROCESSING/ANALYSIS
- Green box: ACCESS
- Blue box: STORAGE/ARCHIVING

HIGH-RATE REAL-TIME GPS DATA FLOW

— RAW DATA — METADATA — DERIVED PRODUCTS — ALL DATA

PBO Network Total Data





Summary

- PBO is geodetic component of EarthScope project
- Network Operations Status
 - 875 new CGPS stations over next 5 years
 - 48 new stations are installed
- Data Management Status
 - Data Management web site: <http://pbo.unavco.org/data>
 - 29 of 48 stations have returned data, 29 routinely
 - Data for Jan-Sep available via GPS archives
- Data Analysis
 - RFPs for Analysis Centers & AC Coordinator in final review
 - Data products: position and velocity solutions, time series, etc.
 - All products available from Archives and EarthScope Data Access System



For more information...



<http://pbo.unavco.org>

www.earthscope.org

Plate Boundary Observatory (PBO)

UNAVCO Apple News Weather Yahoo! Morning

Plate Boundary Observator...





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Plate Boundary Observatory

Augustine Volcano Installation Update

September 16, 2004



Yesterday, workers completed about 98% of station AC27. Fortunately the weather was nice, with a little bit of a breeze keeping the mosquitoes away for the majority of the day. Once again the crew was safe from bears, but was joined by a small herd of caribou near the station.

[More Details >>](#)
[Updates Archive >>](#)
[Augustine Web Cam >>](#)

GPS Monument Overviews and Design

- [Deep Monument Overview](#)
- [Short Monument Overview](#)
- [Design and Specifications](#)

PBO Strainmeters

Pages related to PBO Strainmeters is now available [click here to access](#)

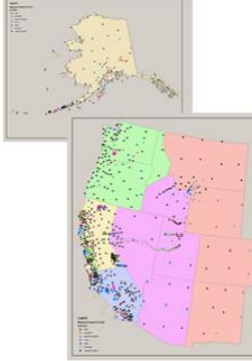
PBO Data and Data Products Plan

The PBO Data and Data Products Plan is on line [click here to access](#)

Network Status Updates - 08/31/04

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

- [More Updates](#)



PBO Operations

- Station siting
- Operations Documents
- Strainmeter Design Specifications

Personnel

- Organizational Chart
- Current UNAVCO, Inc. Job Openings

[Related links](#)

Data and Data Products

- PBO Data Management Plan
- Download PBO RINEX Data via ftp
- Download PBO RINEX Data via GSAC

Data Questions? Contact Greg Anderson at anderson@unavco.org or (303) 381-7555

Related Publications

- PBO/EarthScope Publications
- PBO/EarthScope Presentations

[PBO Frequently Asked Questions](#)

Education & Outreach

- Map Tools
- Classroom Resources
- Related Links
- Documents

PBO Procurement


- Documents
- Request for Proposals
- Drawings
- UNAVCO Procurement Page

[Email Discussion Forums](#)

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 \(login required\)](#)



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)