

12.540 Principles of the Global Positioning System Lecture 21

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Summary

- Sources of GPS data and results
 - Major international organizations involved in GPS
 - Examine access to GPS data
 - Examine access to GPS results

IGS

- Data for each IGS station is openly available usually within <1 day of collection. Some sites are available hourly.
- The central bureau of the IGS is located at: <http://igs.cb.jpl.nasa.gov/>
- Explore site for structure: Web site index gives an overview of page content.

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US Groups

- There are a number of large US groups that run GPS networks.
- Largest array in the US is the Plate Boundary Observatory (PBO) <http://pbo.unavco.org>
- Other groups in the Western United States have networks of 20-50 stations. In all over 1600 geophysical class stations in Western US and Alaska.
- Many other stations, often transmitting in real-time (1-sec latency) are available from local governments and private companies.

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Plate Boundary Observatory (PBO)

- Installation of 875 new GPS stations across the Pacific-North America plate boundary and a large number of bore-hole strain-meters and 5 long baseline strain-meters.
- Project part of NSF funded Earthscope project with contributions from USGS and NASA.
- Started in late 2003 and will be completed November 2008.
- Web site: <http://pbo.unavco.org/>

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National Geodetic Survey CORS

- Main reference frame of the United States.
- Continuously Operating Reference Stations (CORS)
- <http://www.ngs.noaa.gov/CORS/>
- Serves the geodetic control needs of the US.
- About 300 GPS sites currently in the network many of them shared with other institutions.

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Western US Groups

- Networks in the Western United States
 - Plate Boundary Observatory (PBO)
<http://pboweb.unavco.org/>
 - BARD (Bay Area Regional Network)
<http://quake.geo.berkeley.edu/bard/>
 - PANGA (Pacific Northwest Geodetic Array)
<http://www.panga.cwu.edu/>
<http://www.geophys.washington.edu/GPS/gps.html>
 - For list of arrays see:
<http://sopac.ucsd.edu/cgi-bin/dbShowArraySitesMap.cgi>
- Explore these web sites.

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Availability of processed GPS data

- Many of the network groups put analyzed results on their web pages as well as access to data.
- IGS also sponsors 8 global analysis groups (funding comes from other sources).
- SCIGN uses three analysis groups:
<http://sideshow.jpl.nasa.gov/mbh/series.html>
<http://reason.scign.org>
<http://geoapp03.ucsd.edu/gridsphere/gridsphere>

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Other important groups

- University Navstar Consortium (UNAVCO) facility and corporation
<http://www.unavco.org>
- Unavco is installing the Plate Boundary Observatory (PBO).
- Supports a variety of applications of GPS. Initially tectonic deformation but now Antarctic Research and low-precision GIS applications
- Supports US Universities in installing GPS through out the world for geophysical studies.

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Summary

- Data from thousands of GPS stations are collected and processed each data
- Largest single array is in Japan (>1400 stations) with PBO following closely (1100)
- GPS developments are like the internet development: Many active contributors but often quality is debatable.
- Examine the nature of these networks for the remainder of the lecture.

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