Fixed Reference Stations

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CORS Overview

- ~2100 stations – United States, Pacific, Caribbean, Asia, Central America.
- Geodetic quality receivers / antennas
- GPS to GNSS upgrades at many stations

- 24/7 operation; data streams (1, 5, 10, 30 seconds)
- Transmission via TCP/IP, cellular modems, frame relay
- Data formats – native binary, RTCM, RINEX

- Data freely available – cors.ngs.noaa.gov
- Anonymous FTP; UFCORS web interface

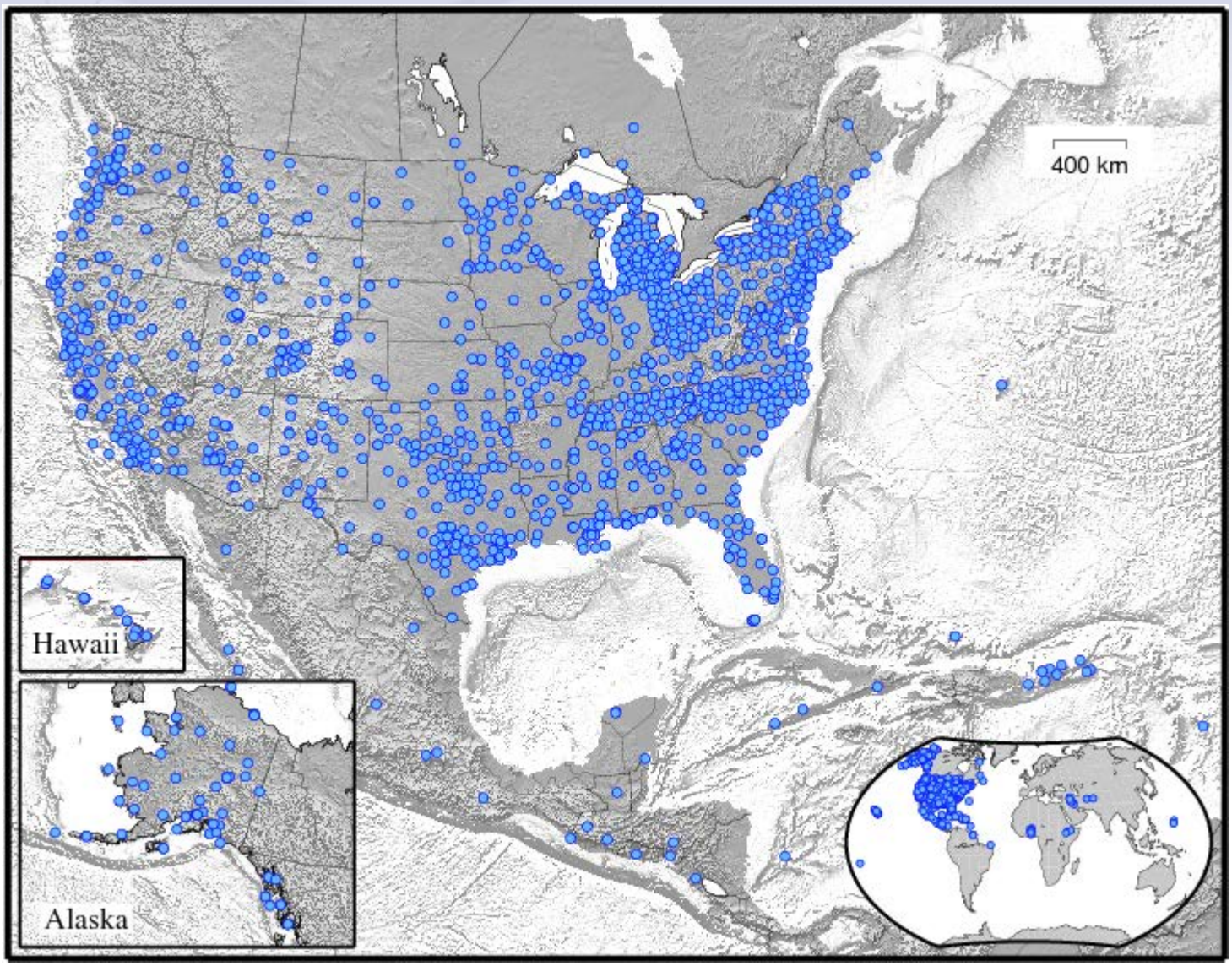
CORS Products

- RINEX Data (hourly and daily sets) available
- GLONASS data from subset of stations.
- UFCORS 4.x (custom RINEX datasets) will support GNSS
- Horizontal Time Dependent Positions (HTDP)
- GLONASS orbit production and processing
- IGS products – RINEX data, ephemerides, coordinates, log files

CORS Supported Services

- DGPS – Coordinates for US Coast Guard differential corrector system
- LORAN – Backup system ?
- Constellations – GPS, GLONASS, Galileo (5 satellites)
- Precise positioning – 24/7 web-based access to OPUS
- Short term water vapor forecasts
- Ionospheric modeling
- Third party survey/engineering applications
- OPUS-DB – store user-contributed data and positions
- OPUS-Projects – Process multi-day, multi-session GPS projects

CORS Network – Foundation for the NSRS



CORS – Selection Criteria

70 Km CORS Spacing – NGS can meet and support NOAA mission requirements with a spacing at this distance. A higher CORS station density results in excessive redundancy and places a significant impact on NGS resources.

Other Considerations

- Receiver / Antenna Equipment – GPS vs GNSS
- Monumentation
- Scientific Interest – i.e. subsiding area
- Geographic Location / co-location with other observing system
- Collection Rate

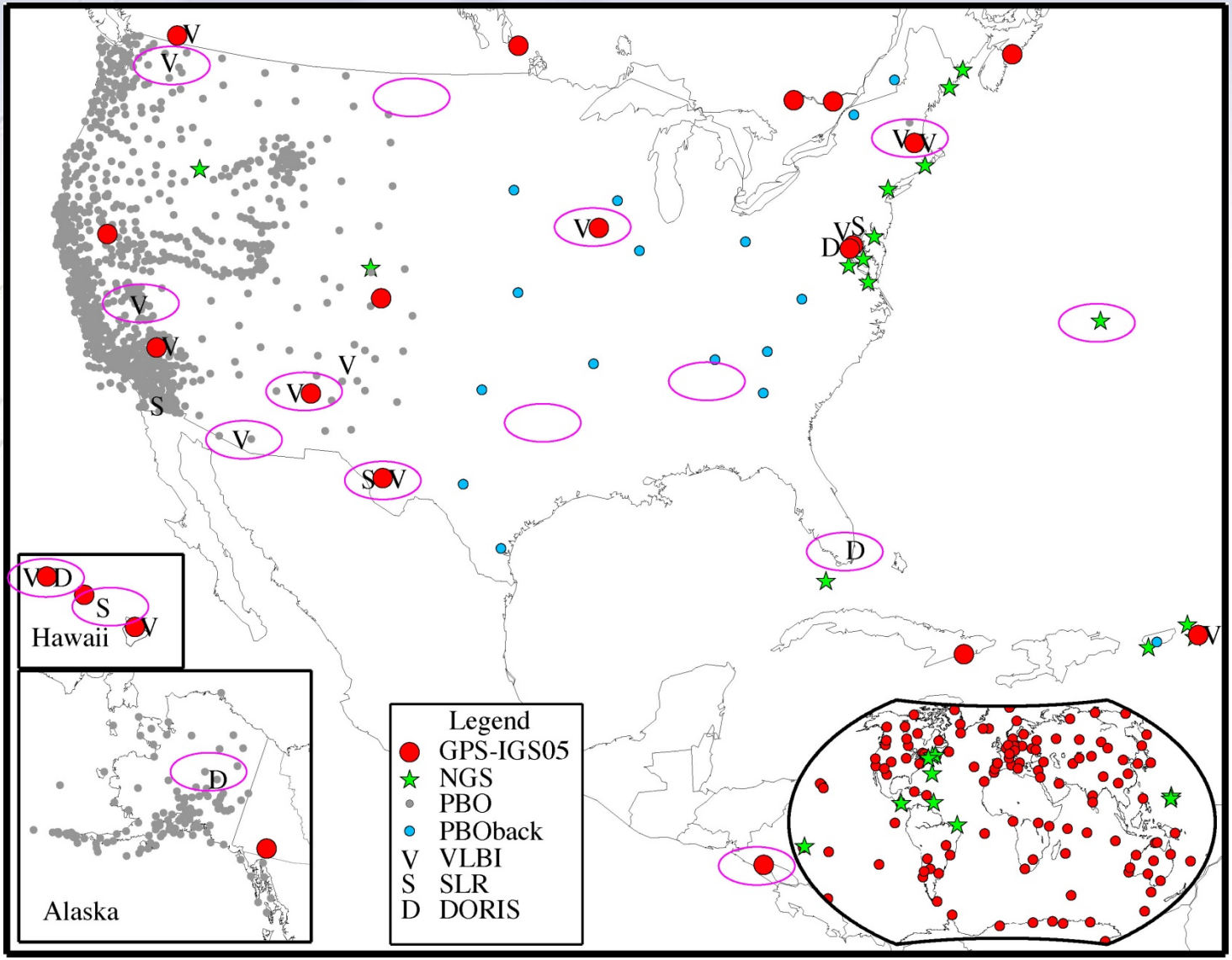
Foundation CORS

- Support GGOS – Global Geodetic Observing System
- Link to ITRF at sites co-located with VLBI, SLR, DORIS

- Drill braced monumentation
- GNSS equipment

- Install ~12 stations in the United States, Alaska and Hawaii. Possible site at US Territory in Pacific.
- Timeline: ~2 sites/year starting by FY14
- Current Installation: Near Miami, Florida

Foundation CORS



New Geometric Datum

- Cartesian coordinate system
- Designed to be Earth Centered, Earth Fixed (ECEF)
- Positions represented as an X,Y,Z set with (0,0,0) located at the origin of the coordinate system – center of the Earth
- Allow for individual plate motions
- Coordinates will have velocity components

- WGS 84 and IGS08 are ECEF systems
- NAD 83 is a plate-fixed system – North American plate
- 3-4 foot magnitude difference between NAD 83 and WGS 84 / IGS

- Define new SPC system ?

UN-Global Geospatial Information Management

- United Nations Initiative
- Promote a Global Reference Frame
- International Association of Geodesy
- Based on International Terrestrial Reference Frame
- Consistency
  - National
  - Continental
  - Global

- UN Resolution
- Roadmap
  - Definitions
  - Benefits

Thank You

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