NGS Continuously Operating Reference Systems (CORS) West Facility

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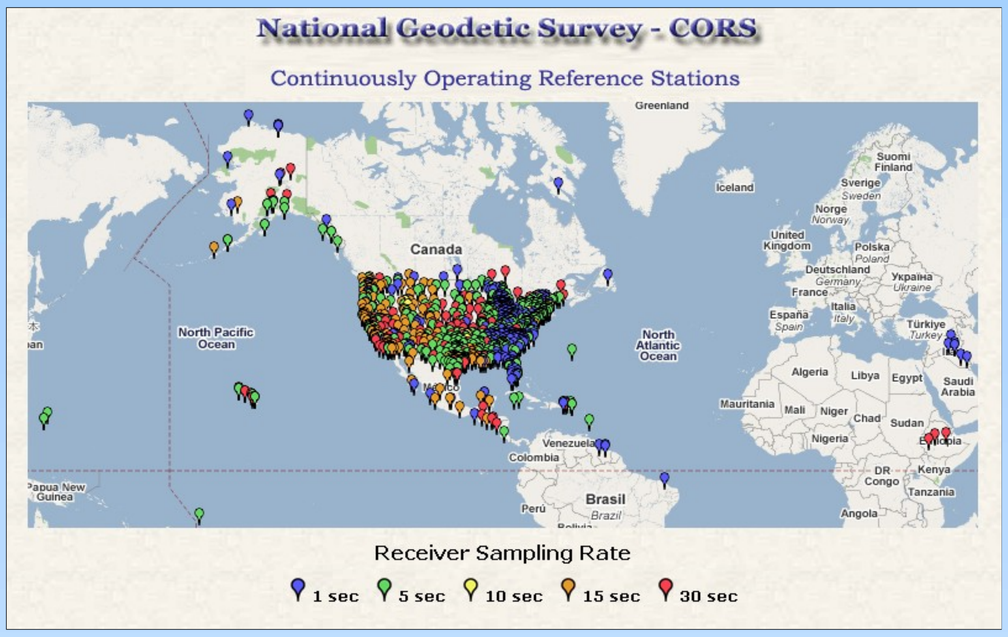
The National Geodetic Survey (NGS), an office of NOAA's National Ocean Service (NOS), manages a network of Continuously Operating Reference Stations (CORS) that provide Global Navigation Satellite System (GNSS) data consisting of carrier phase and code range measurements in support of three dimensional positioning, meteorology, space weather, and geophysical applications throughout the United States and its territories.

Surveyors, GIS users, engineers, scientists, and the public at large that collect GPS data can use CORS data to improve the precision of their positions. CORS enhanced post-processed coordinate approach a few centimeters relative to the National Spatial Reference System (NSRS), both horizontally and vertically.

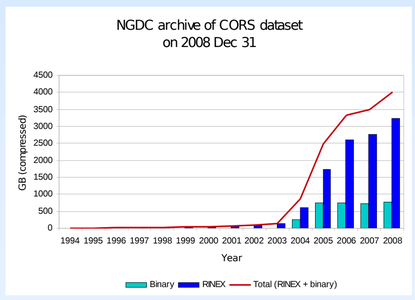
The CORS program consists of a number of products and services that directly supports NGS's mission of "defining, maintaining and providing access to the NSRS for the civilian sector of the US government."



National Geophysical Data Center

The National Geophysical Data Center (NGDC) houses the alternate CORS facility ('CORS-West') as required under the Continuity of Operations Plan for national critical functions. CORS-West is not a mirror of the main facility located in Silver Spring, MD ("CORS-East"), the focus instead is to assure parallel operations. Future efforts for CORS-West include the installation of NGS-tools such as the Online User Positioning Service (OPUS).

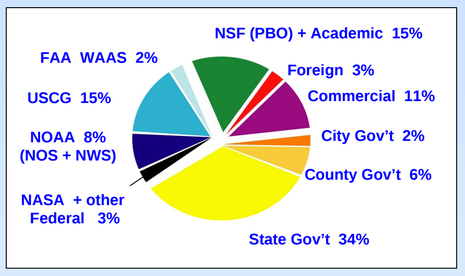
As a separate function, NGDC provides archive support for select CORS data. NGDC also coordinates with NGS the distribution of near real time CORS data to internal NOAA users in support of the US-Total Electron Content operational product and the GPS-Meteorology product (see below).



The NGDC archive includes observational RINEX files, meteorological RINEX files for select sites, and the raw observables used as input in the production of US-TEC and GPS-Met. In 2004, NGDC began archiving RINEX files at the original sampling rate rather than the 30-sec decimated rate as found on the NGS CORS facility online repository.

CORS Network

As of February 2009, the CORS network consists of 1290 sites. The network is >98% volunteer, (i.e. non-NGS owned) from a variety of participants ranging from academic institutions to multiple levels of county and state governments. In 2008, there were ~270 sites added to CORS.

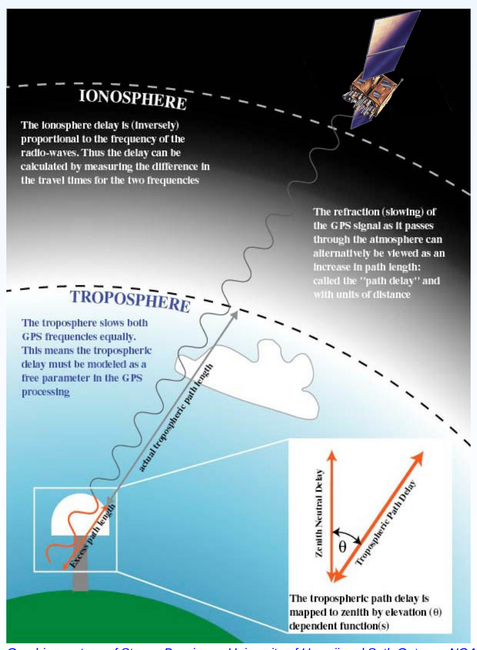


Data Access

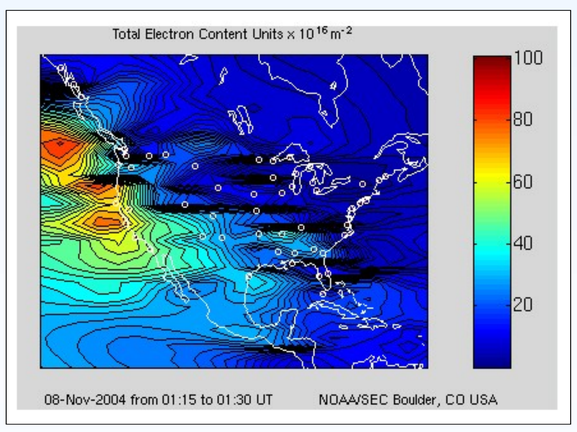
CORS-East main facility	web:	http://www.ngs.noaa.gov/CORS
	FTP:	ftp://www.ngs.noaa.gov/cors/rinex
CORS-West facility	web:	http://alt.ngs.noaa.gov/CORS
	FTP:	ftp://alt.ngs.noaa.gov/cors/rinex

Space Weather and Water Vapor applications of the GNSS signal

Delays of the GNSS signal are used to estimate values of the total electron content in the ionosphere and water vapor in the atmosphere. The CORS-West facility at NGDC provides near-real-time CORS data from the Federal Aviation Administration Wide Area Augmentation System (FAA WAAS) and US Coast Guard Maritime and Nationwide Differential GPS (USCG M/NDGPS) for input into these models.

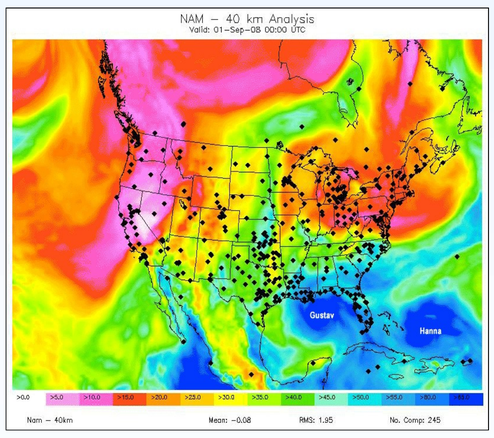


Graphic courtesy of Steven Bussinger, University of Hawaii and Seth Gutman, NOAA



Total Electron Content in the Ionosphere

GNSS data are used to measure quantities of electrons along the wave path from GNSS satellites to the ground-based receivers over CONUS by NOAA's Space Weather Prediction Center (SWPC). The TEC product is designed to estimate the signal delay for single and dual-frequency GNSS applications. This image shows TEC values during the November 2004 ionospheric storm.



Water Vapor in the Atmosphere

CORS stations are used for water vapor measurements by NOAA's Earth Systems Research Laboratory Ground Systems Division (ESRL - GSD) GPS-Meteorology Program. This image shows values for Hurricanes Gustav and Hanna in September 2008.

National Geodetic Survey

National Geophysical Data Center (NGDC)
NOAA Satellite and Information Service

CIRES

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