



Meeting the need for accurate  
and reliable positioning  
in a dynamic state

CALIFORNIA SPATIAL REFERENCE CENTER

Providing California's  
geodetic framework for  
scientific, surveying, engineering,  
and geographic information systems



<http://CSRC.UCSD.edu>

# CSRC Programs & Activities

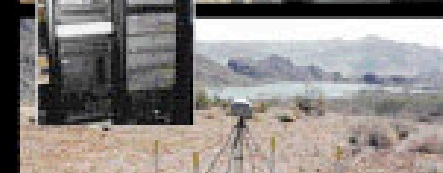
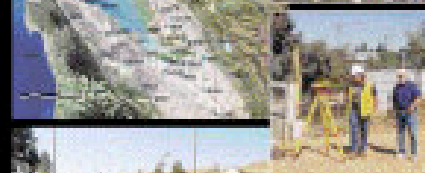
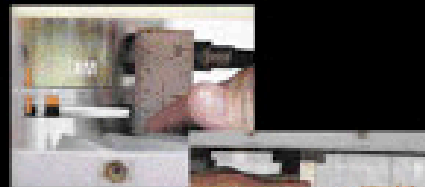
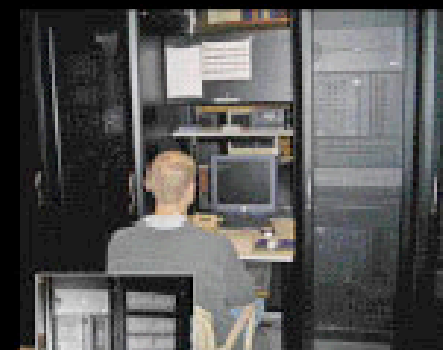
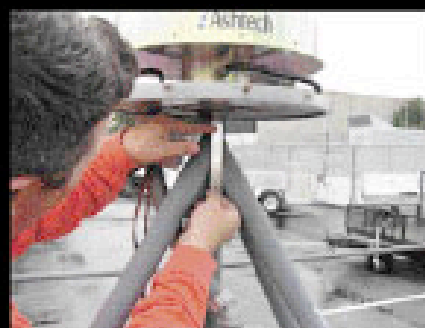
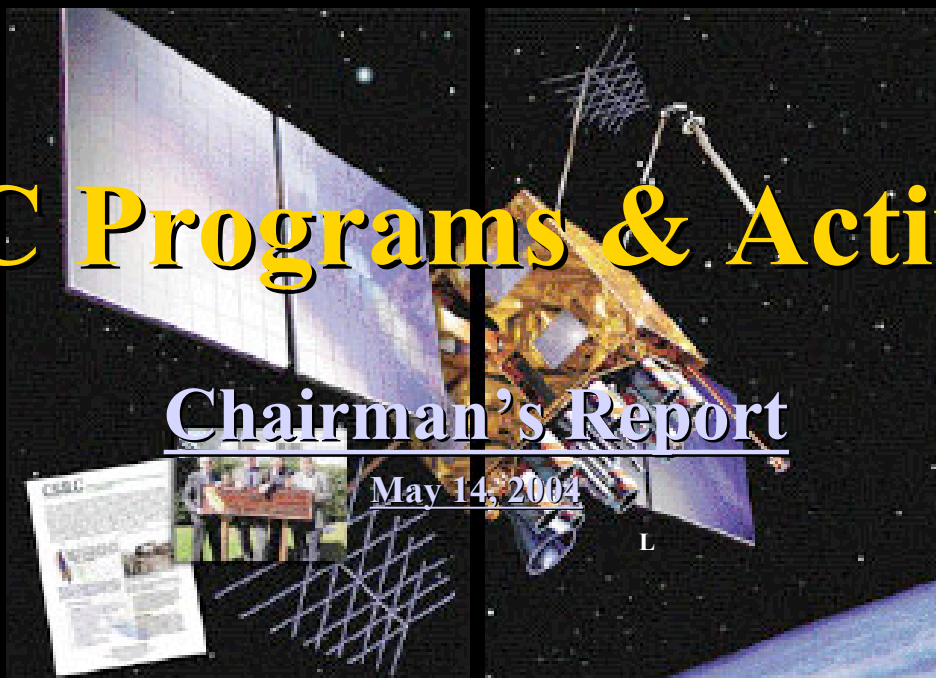
## Chairman's Report

May 14, 2004

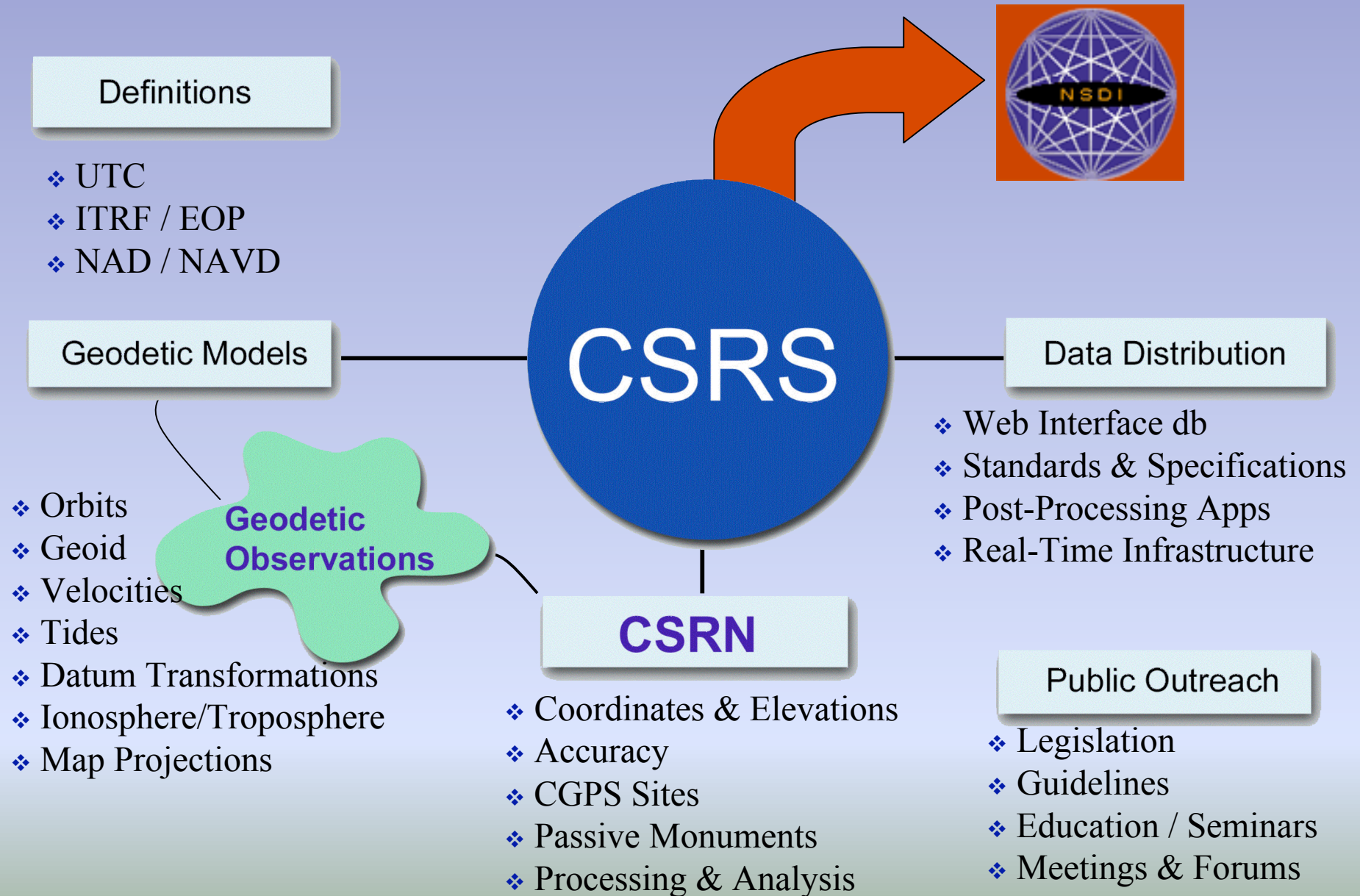
California Spatial Reference Center  
web and home page and data portal contents



- Established a statewide network of GPS/GNSS stations
- Research and develop GPS and geodetic technology
- A major GPS/GNSS and geodetic reference system for California
- GPS/GNSS and geodetic technology for public sector
- A statewide GPS/GNSS reference system for California
- A statewide GPS/GNSS reference system for California



# California Spatial Reference System





# Master Plan Networks

Yolo Co  
Contra Costa Co  
South SF Bay  
Glenn Co

San Joaquin  
Valley

Tuolumne Co

CGPS Only  
CORS  
Leveling

40 0 40 80 Kilometers

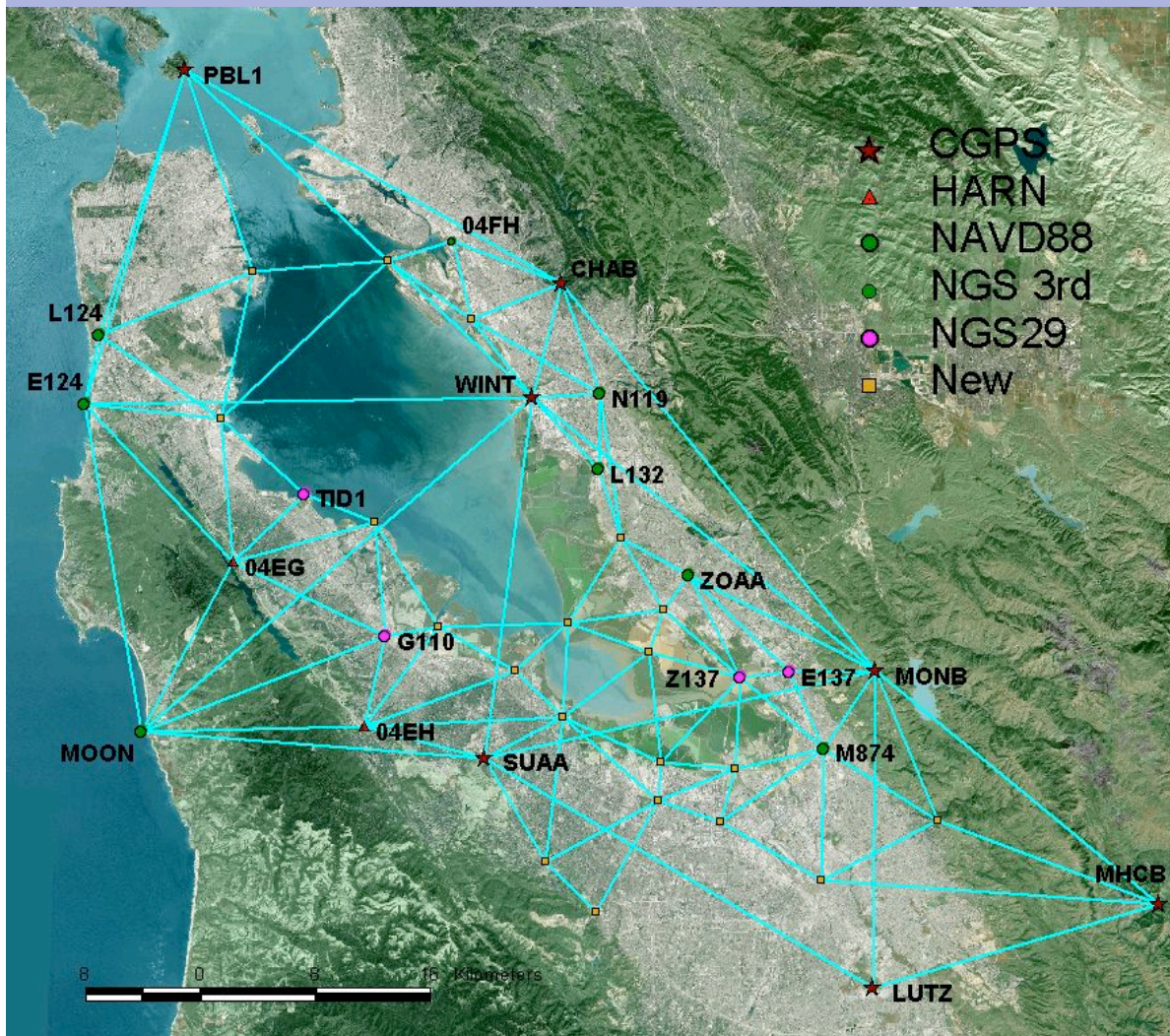
- Proposed PBO Sites
- ★ Proposed CSRC CGPS
- ★ Existing CGPS Sites
- CGPS Only Regions
- ∇ Passive Stations Corridors (7 km Spacing)





# Passive Control Networks

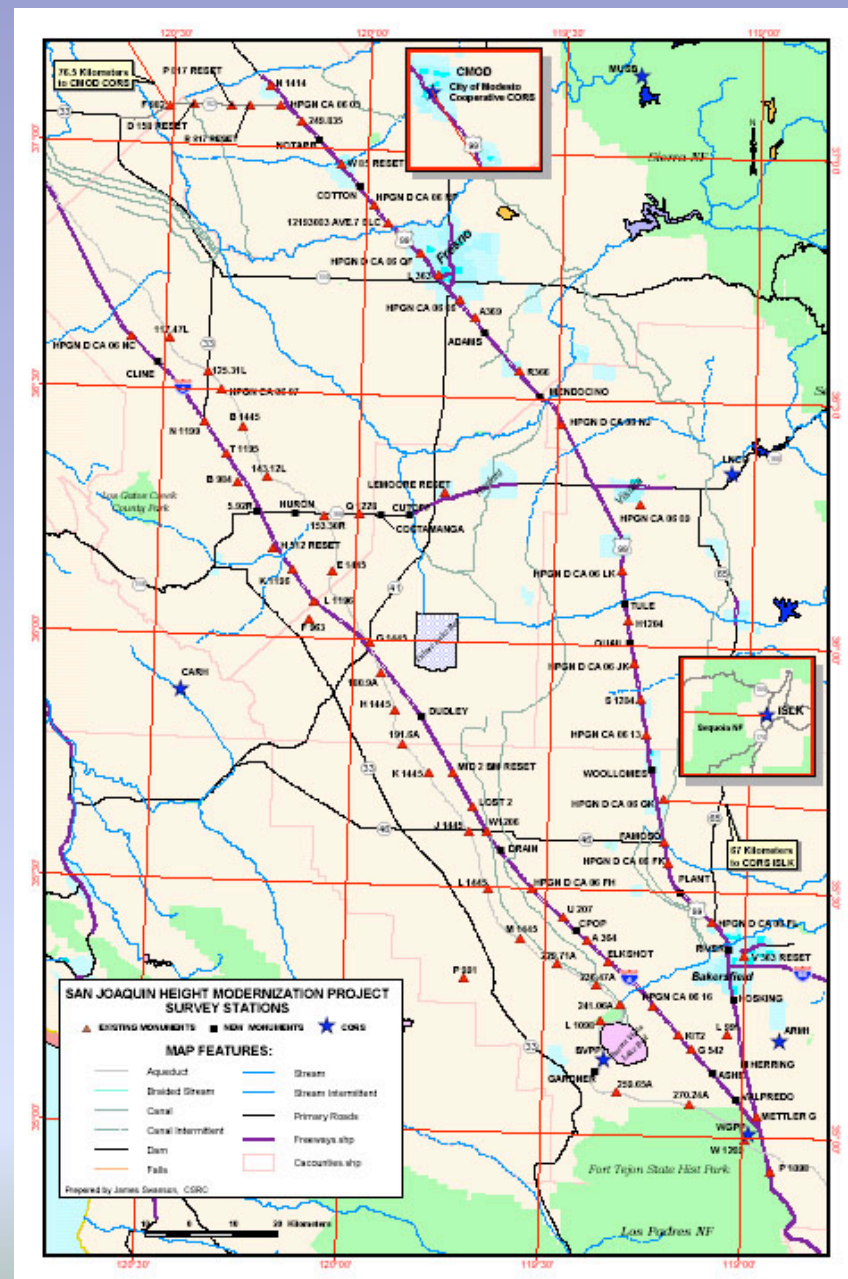
## South San Francisco Bay Height Modernization



- NAVD88  
1991, 1994 & 2001
- NGVD29 Transformed  
Vertcon
- Geoid 99
- Geoid 2003

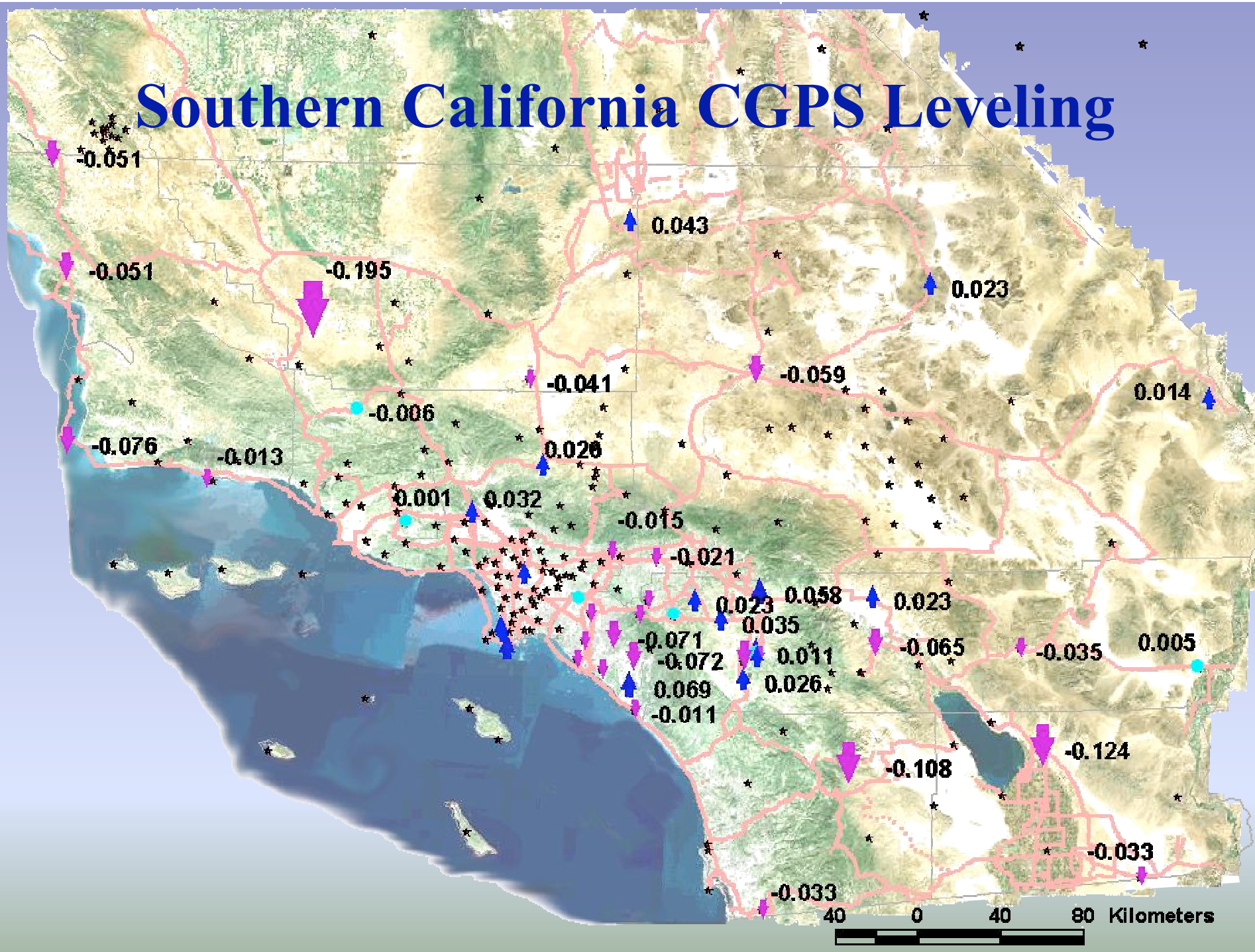
# San Joaquin Valley Network

- 105 Stations
- Caltrans Leveling (E-W Hwys 152 & 198)
- Caltrans Hght Mod GPS
- Consultant proposals in review



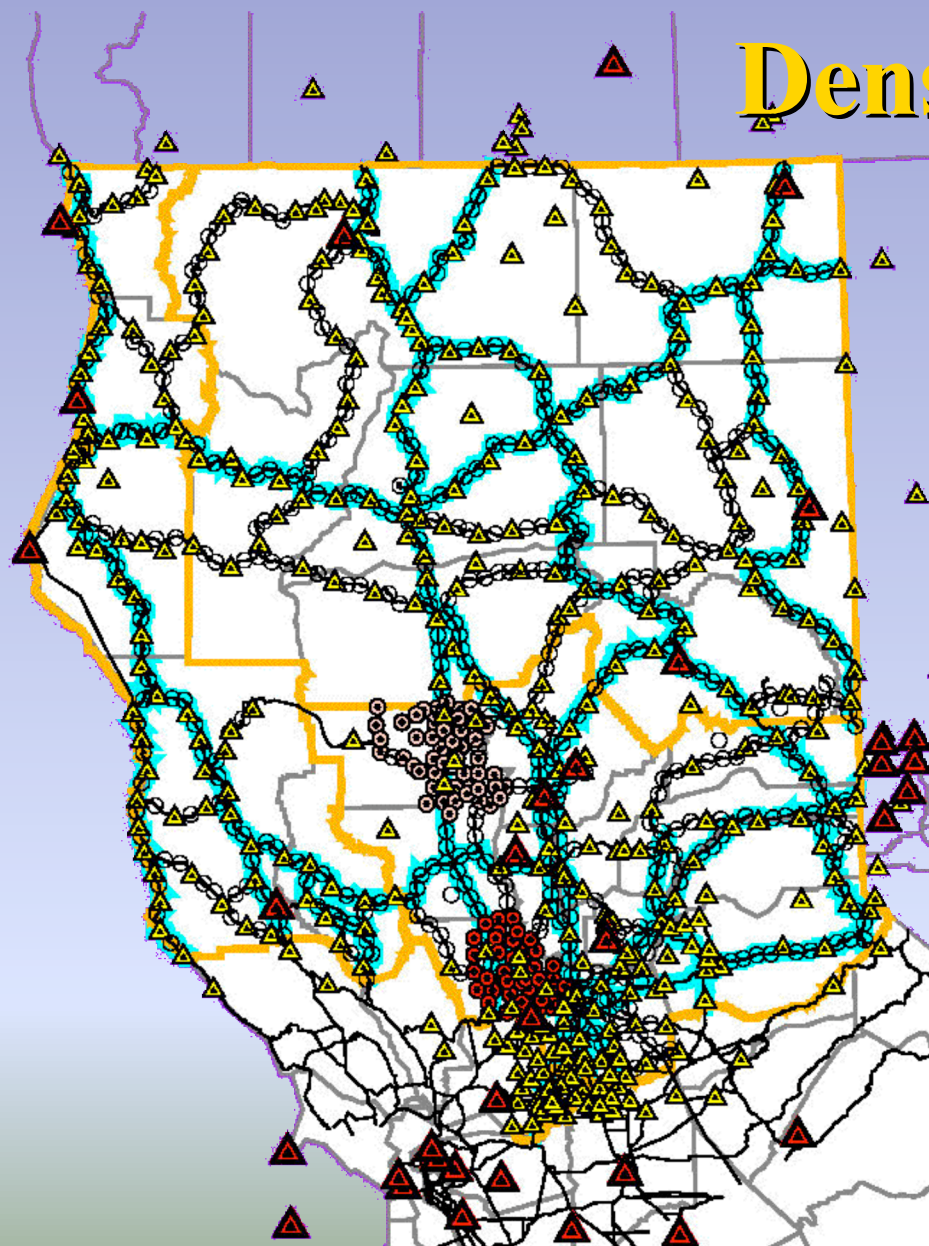











# Southern California CGPS Leveling



# Northern California Densification Network

Caltrans Districts  
800-900 Stations  
~ 2 Years  
2cm Hgt Mod



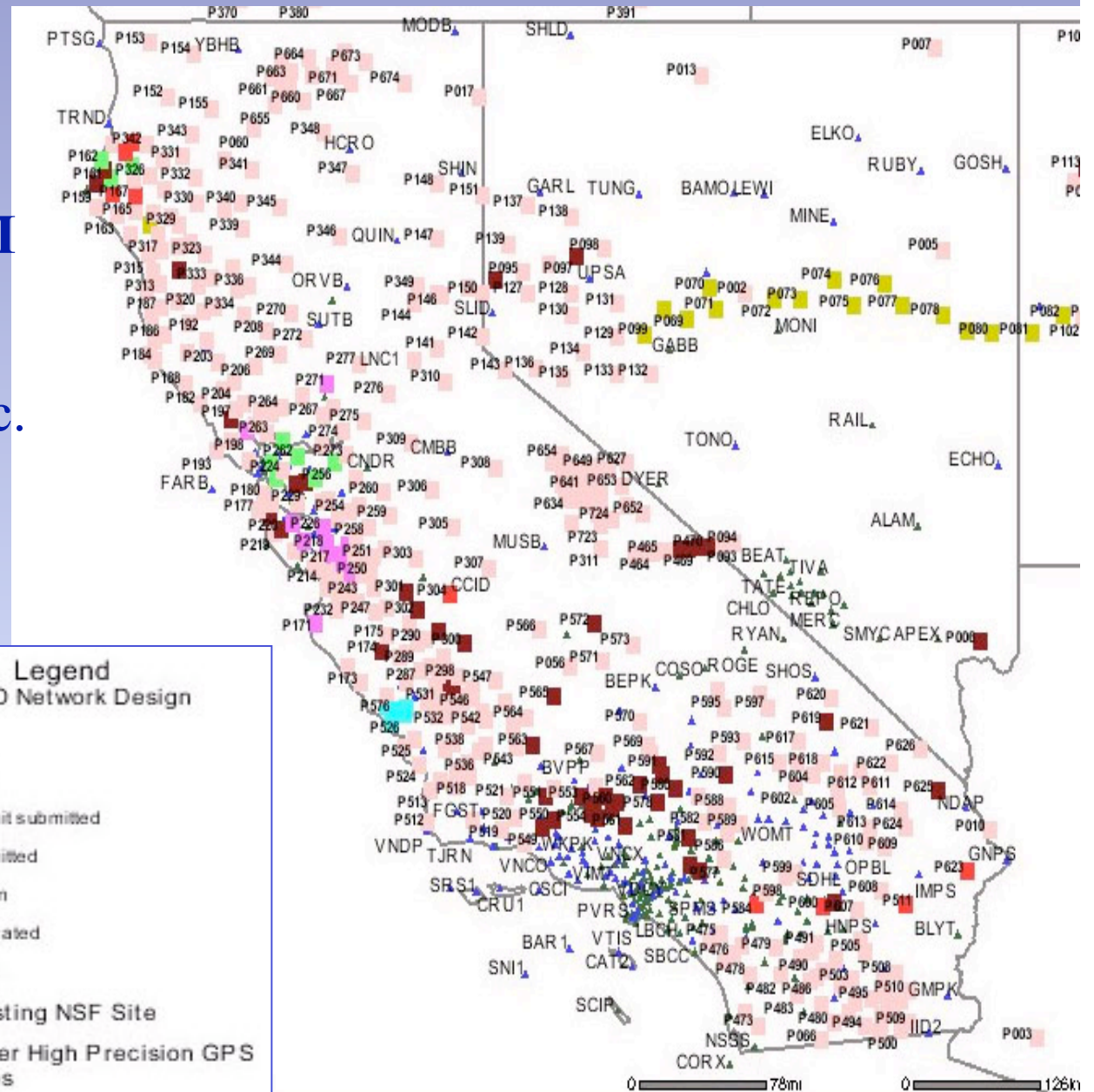
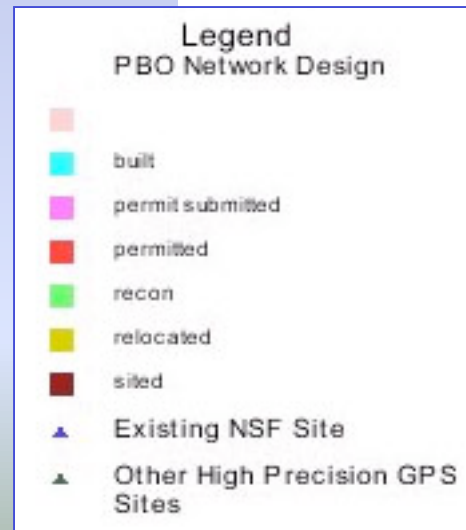
-  CORS
-  NORTH REGION HPGN/HPGN-D
-  YOLO COUNTY SUBSIDENCE NETWORK
-  GLENN COUNTY PROJECT
-  NORTH REGION DISTRICT BOUNDARIES
-  NORTH REGION COUNTY BOUNDARIES
-  CSRC MASTER PLAN CORRIDORS
-  STATE HIGHWAYS
-  NEW STATION LOCATION





**1<sup>st</sup> Five Years: \$219M**  
**PBO \$30M FY03/04**

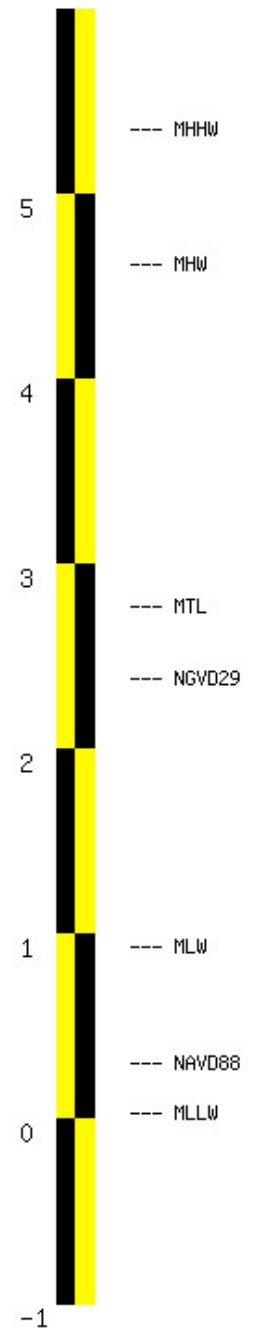
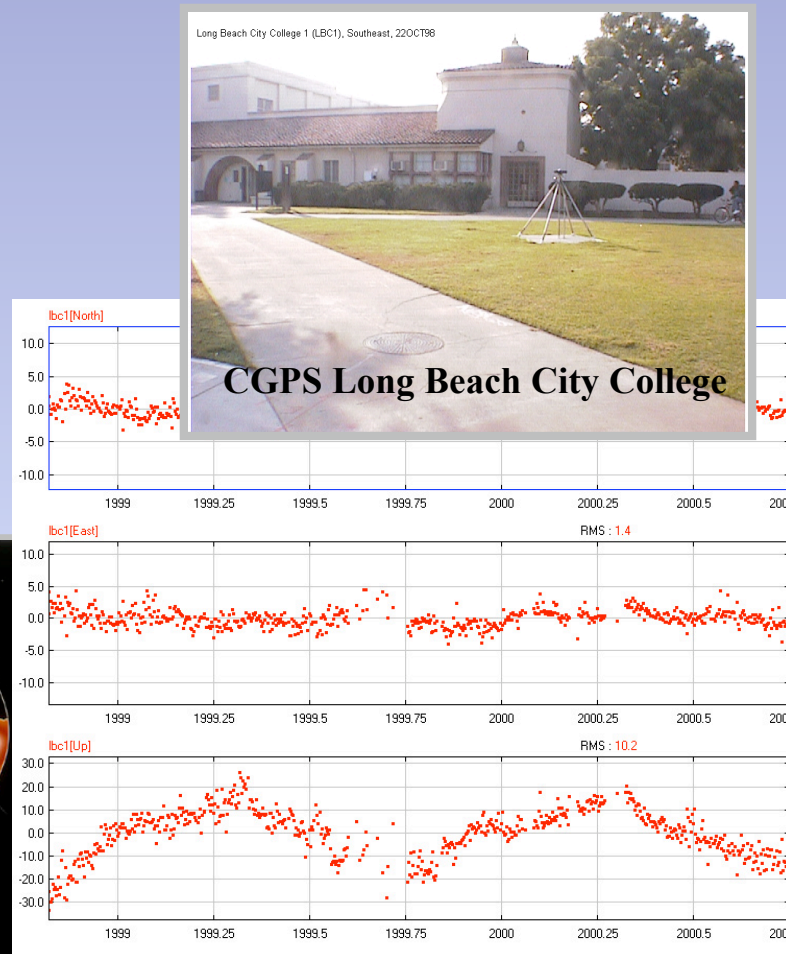
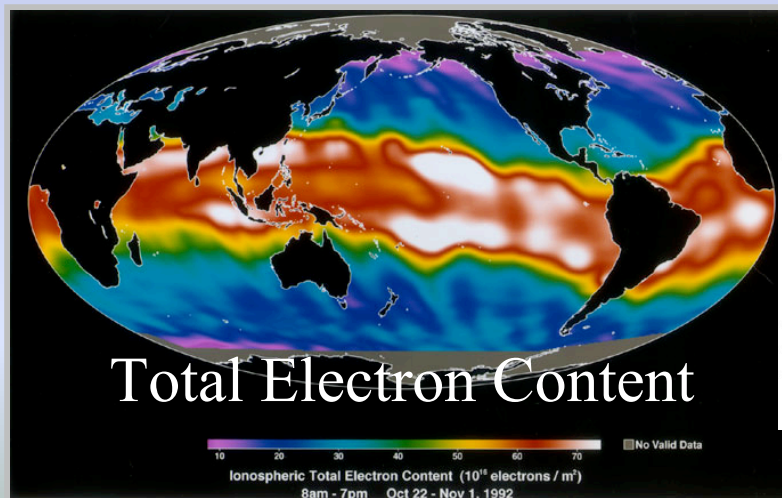
- NSF / UNAVCO, Inc.
- 12 Years 800 CORS
- High-Speed Data





# Geodetic Models

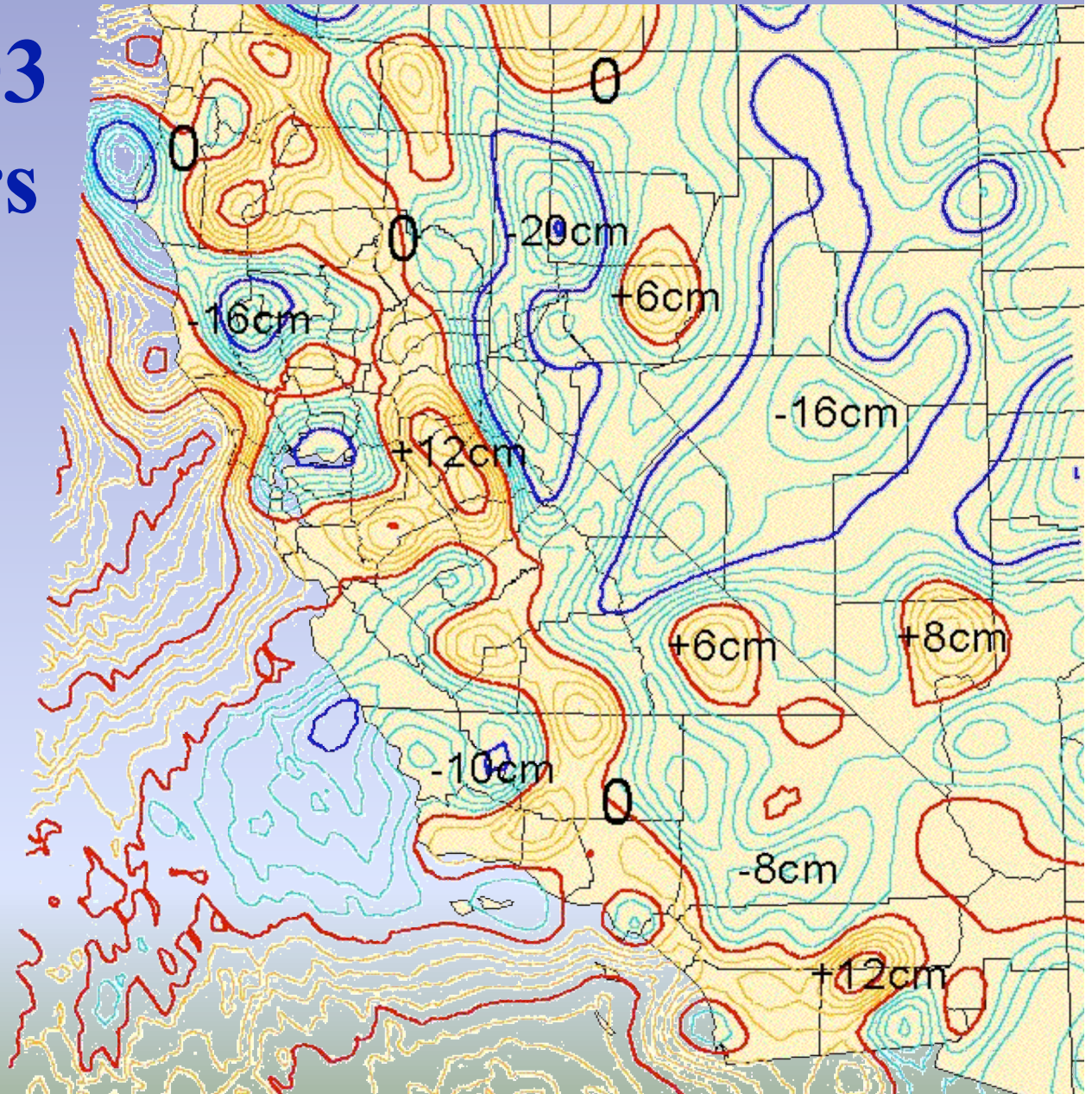
- GPS Orbits
- Antenna Phase Center
- Ionosphere
- Troposphere
- Geoid
- Velocity Models
- Subsidence
- Datum Transformations



# Spatial Reference System Infrastructure

## Geoid 99 to 03 2cm Contours

Data Management  
Metadata  
Communication  
Terminology





# Data Management Infrastructure

## CSRC Data Portal

**CALIFORNIA SPATIAL REFERENCE CENTER**

Home | Index | Map | Data | Reports | Contact

Enter CSRC Data Portal | Maps | Projects

CSRC Data Portal: Map Browser Jump to: [Current Data](#) View Portal Resources

**Map Mover**

**Map Layers**

☐ Data California Points

☒ Callibri

☒ Callibri

☒ Callibri

☒ Callibri

☒ Callibri

☒ Callibri

**Larg**

75C

125C

175C

200C

250C

**SOPAC SITE INFORMATION MANAGER 1.3**

Site: sio3 Go To -Site Functions- -Site Metadata-

Site Metadata Type: Antenna / Dome  
Site: sio30000  
SIM User: anonymous

Effective Date: 04/12/2000:01:50:00

Antenna Type (scroll to current model):  
ASH701945B\_M  
ASH701945C\_M  
ASH701946.2

Antenna Serial Number: CR519991721

Antenna Reference Point: BPA

Marker->ARP Up Ecc. (m): 1.7452

Marker->ARP North Ecc. (m):

Marker->ARP East Ecc. (m):

Alignment from True North (deg): 0

Antenna Radome Type: SCIS

Radome Serial Number: 79

Antenna Cable Type:

Antenna Cable Length (m):

Print Query Contact User Login Help

View/Edit site-related information. Internet

## NGS Data Sheets

DATABASE = Sybase ,PROGRAM = datasheet, VERSION = 6.98  
1 National Geodetic Survey, Retrieval Date = FEBRUARY 28, 2004

AC6794 \*\*\*\*\*  
AC6794 PACS - This is a Primary Airport Control Station.  
AC6794 DESIGNATION - IFP C  
AC6794 PID - AC6794  
AC6794 STATE/COUNTY- AZ/MOHAVE  
AC6794 USGS QUAD - DAVIS DAM (1983)  
AC6794  
AC6794  
AC6794 \*CURRENT SURVEY CONTROL  
AC6794  
AC6794  
AC6794\* NAD 83 (1992)- 35 10 01.60424(N) 114 33 34.40302(W) ADJUSTED  
AC6794\* NAVD 88 - 188.21 (meters) 617.5 (feet) GPS OBS  
AC6794  
AC6794 X - -2,169,593.428 (meters) COMP  
AC6794 Y - -4,747,654.265 (meters) COMP  
AC6794 Z - 3,653,129.415 (meters) COMP  
AC6794 LAPLACE CORR- 1.17 (seconds) DEFLEC99  
AC6794 ELLIP HEIGHT- 158.22 (meters) (01/12/01) GPS OBS  
AC6794 GEOID HEIGHT- -29.97 (meters) GEOID03  
AC6794  
AC6794  
AC6794 HORZ ORDER - B  
AC6794 ELLP ORDER - FOURTH CLASS I  
AC6794  
AC6794  
AC6794.This mark is at Laughlin/bullhead Intl Airport (IFP)

## Online GSAC Access Points

**GSAC Wizard Web Client**

**Command-Line Client**

**Interactive**

**Batch**

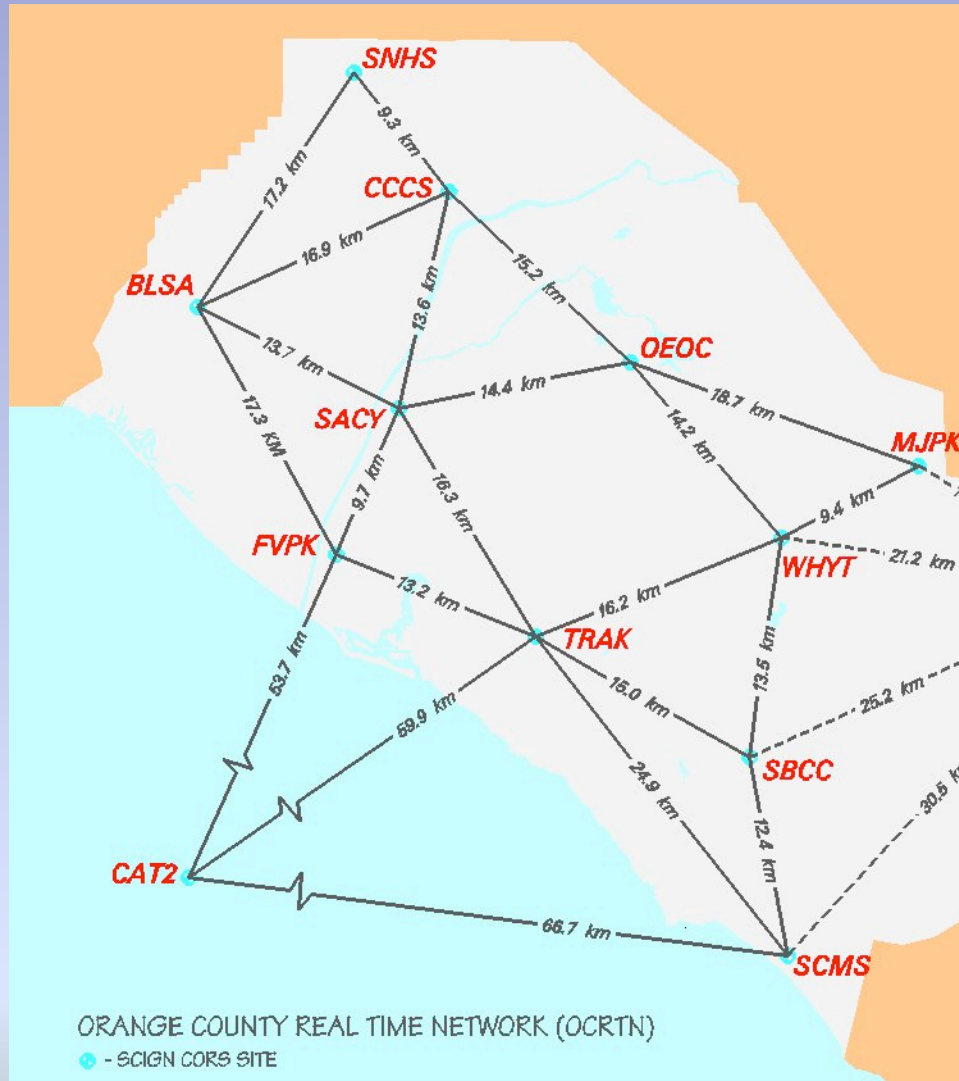
**Maps**

**Service**

GPS  
Seamless  
Archive

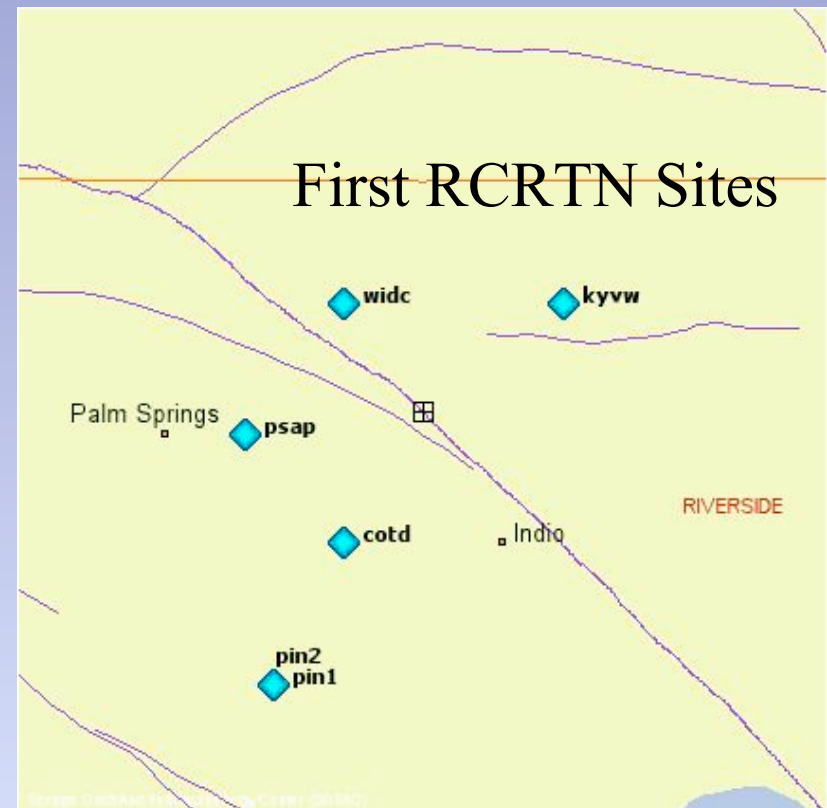
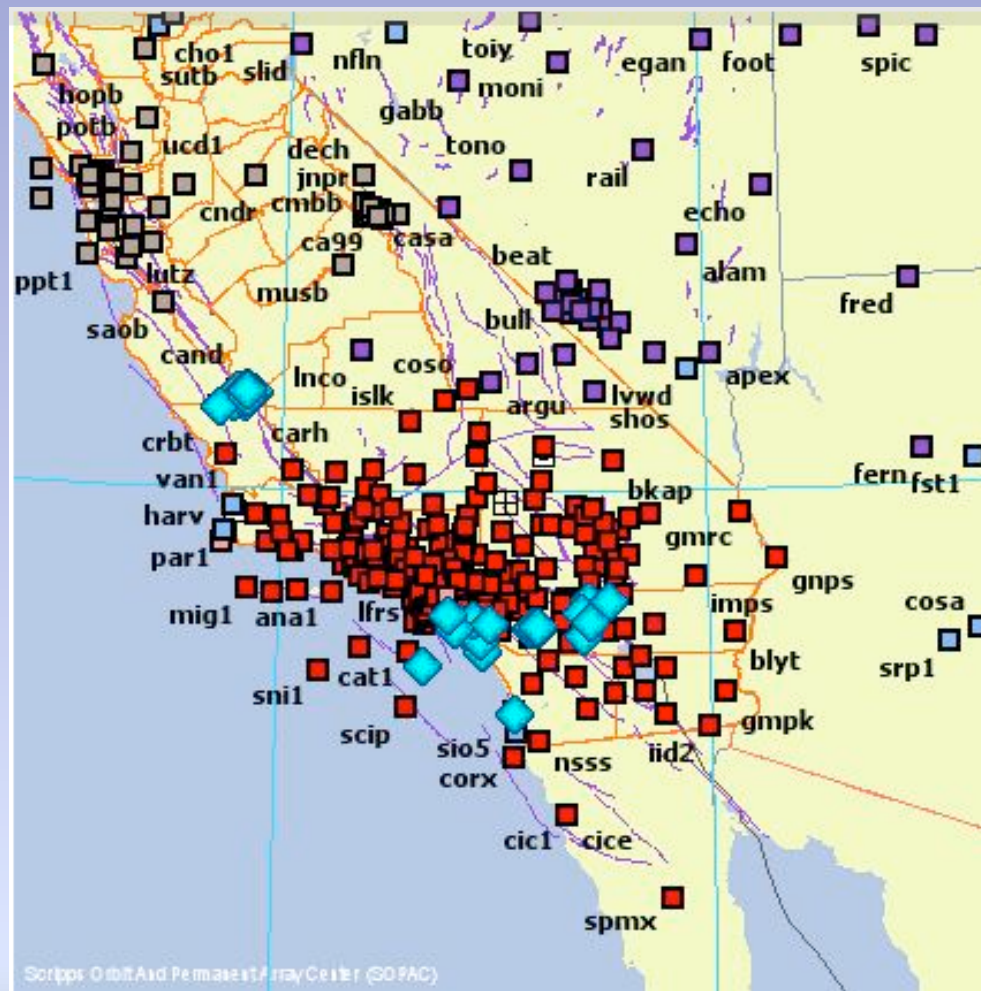


# Real-Time Networks



OCRTN - Operational  
Parkfield - Operational  
Riverside Co. - In Progress  
Bay Area  
LA County  
San Diego Co. - In Progress

# Real-Time High-Rate CORS



**Diamonds:** Real-Time (1 s)  
High-Rate (1 Hz) Sites

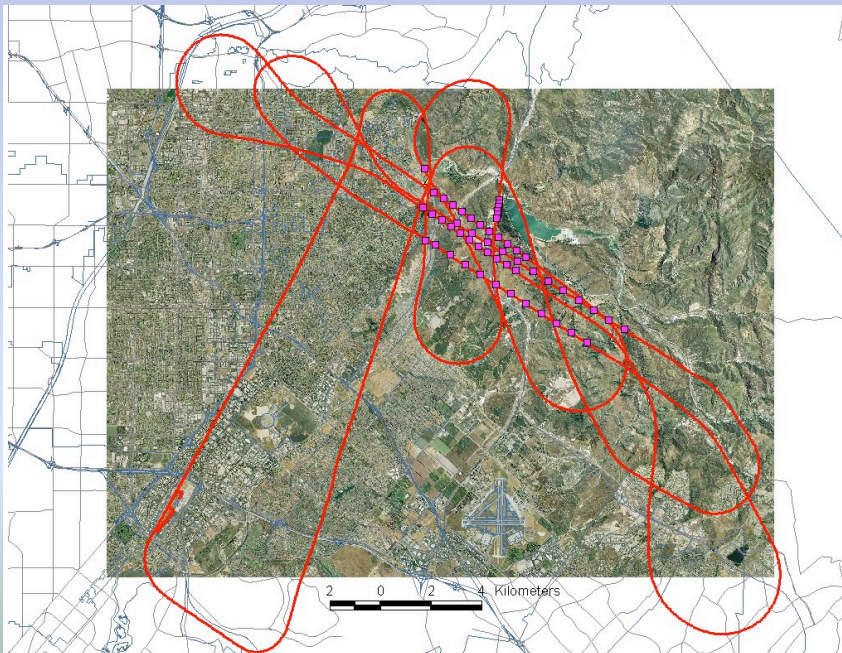
**Squares:** 6-24 hr download,  
5-30 s sampling rate.



# Real-Time Applications

~ Demand

- Machine Guidance
- Intelligent Vehicles
- Precision Navigation
- Emergency Warning Systems

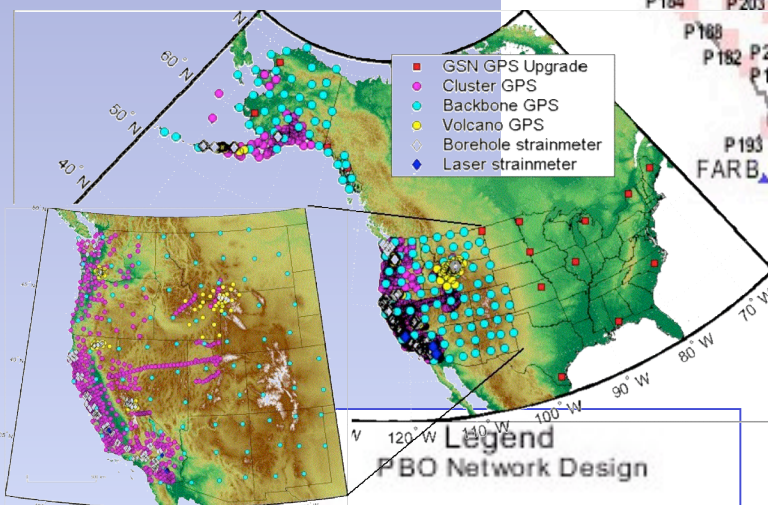


- Weather Monitoring
- Seismic Analysis

**Data Distribution  
Infrastructure**



# earth scope



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