

USArray



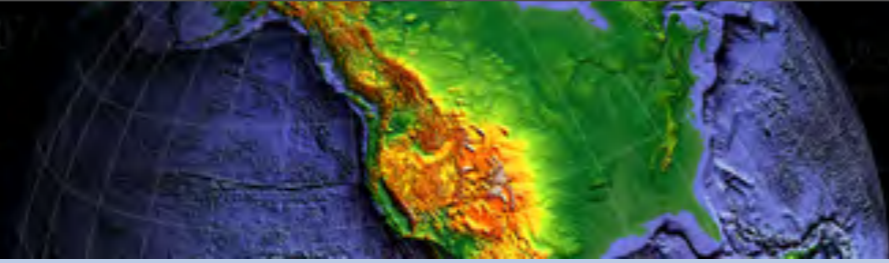
Frank Vernon for the ANF
IGPP
UCSD

Antelope User Group
Allegro Papagayo, Costa Rica
4-6 November 2013



earthscope
USArray

the
IRIS
CONSORTIUM

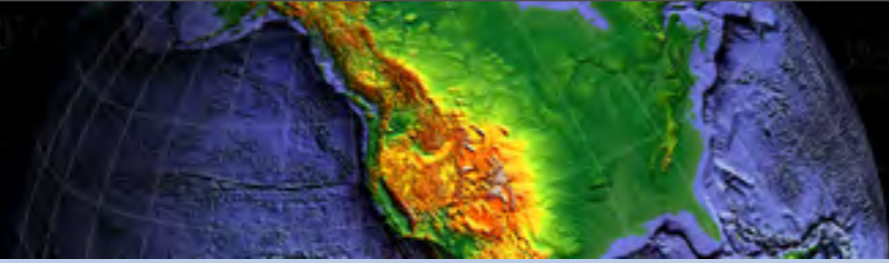


- Number of stations
 - TA operated
 - 1693 so far
 - 471 current
 - Contributed via ORB
 - AZ 3
 - BK 20
 - CI 50
 - NN 3
 - Contributed via Seedlink
 - IU 9
 - LD 1
 - PO 32
 - US 50
 - UU 1



- Staffing
 - 2 FTE system/networking admin
 - 2.5 FTE seismic data QC
 - 1 FTE seismic operations
 - 0.5 FTE met/infrasound data QC
 - 1.5 FTE programmer
 - 1 FTE program management
- NSF Funded

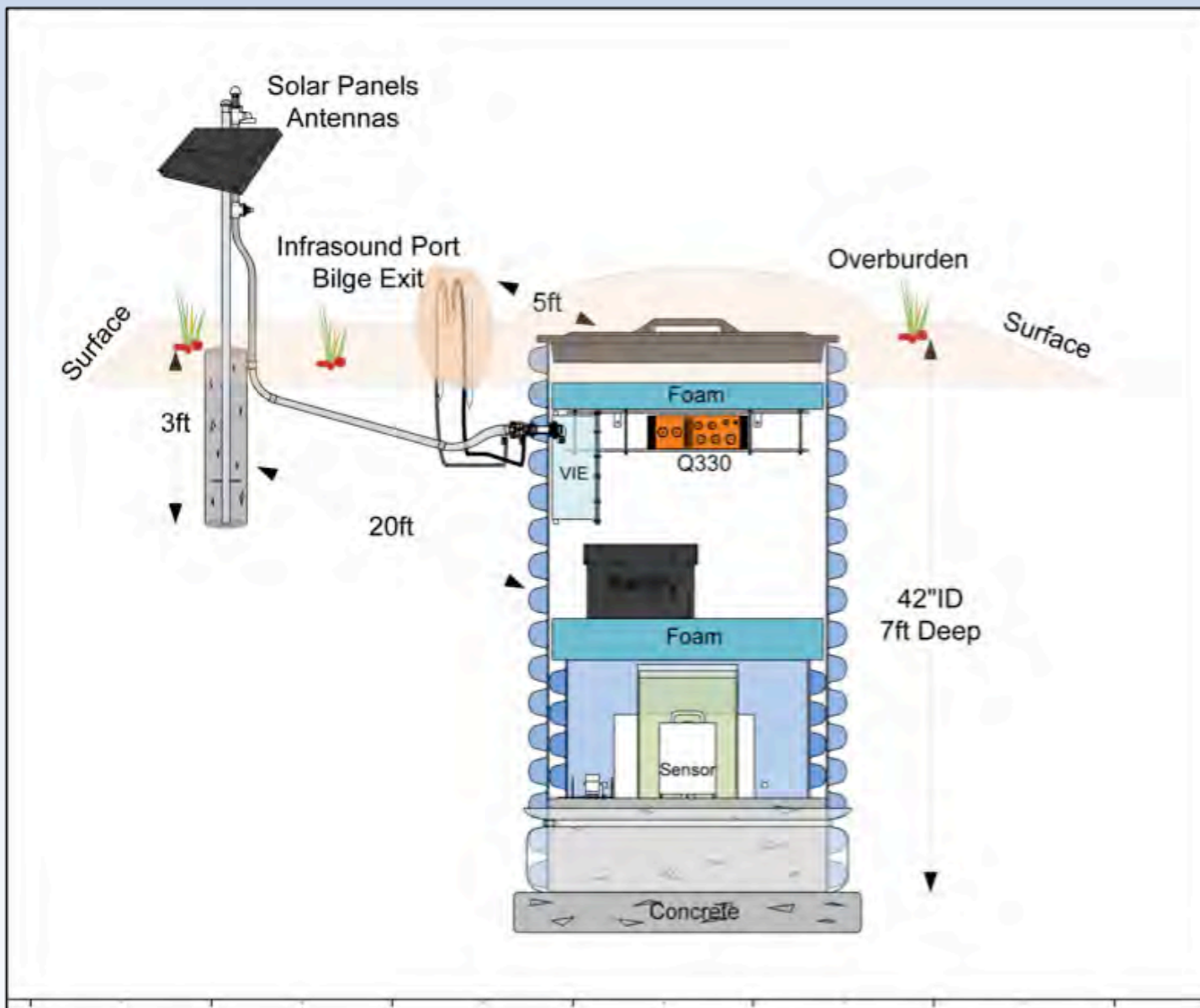
- Hardware
 - 3 Dell R710 Redhat Servers
 - Compellant Storage
 - (32) 2TB SATA 7K RPM Hard Drives
 - (4) total 1Gb iSCSI Front-end ports
 - (4) total 4Gb FC Front-end Ports
 - Total 61 TB usable space
 - 6600 IOPS
 - Future plans
 - Slow growth in processing and disk usage



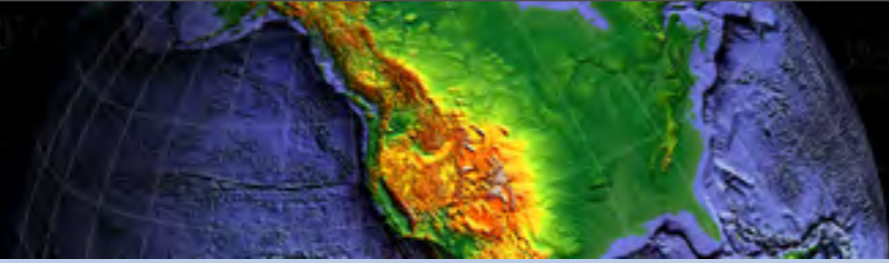
Basic Description

- Sensor: 3 component Broadband seismometer & auxiliary sensors
- Datalogger & local data storage
- Power & data telemetry

TA Station 345A, MS



- Data Acquisition Systems
 - Q330
 - Q330HR
 - Baler 14
 - Baler 44
 - QEP
 - VIE
- Seismic Sensors
 - 220 Streckeisen STS-2
 - 111 Guralp CMG3T
 - 109 Nanometrics Trillium 240
- Mechanisms to bring in data
 - q3302orb
 - orb2orb
 - various baler mechanisms

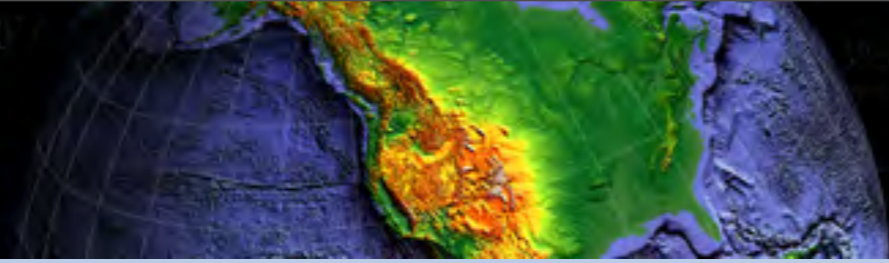


- Primary Data Center
 - IGPP Colo, UCSD
 - 18 hours realtime buffering at stations
- Backup Data Center
 - IGPP, UCSD
 - IGPP Colo offline for more than 12 hours
- Secondary Backup Data Center
 - IRIS DMC
 - SDSC and IGPP both offline

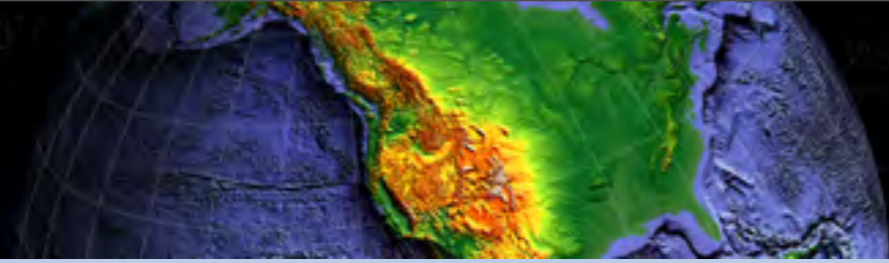
- Sites are selected with the telemetry option as part of the plan.
- The available options in order of preference are:
 - Verizon digital service (EVDO)
 - AT&T (GPRS / GSM)
 - Radio to a VSAT located near AC Power
 - Radio to a location with AC power that has DSL or Cable Modem service available, not landowners.
 - Radio to a VSAT powered by solar panels.
 - Radio range is 20 km line of sight.
 - It is most often a few hundred meters

- Regular operations meetings
 - Monday mornings
 - 1 hour max
 - Review
 - computers
 - analysts
 - programming
 - seismic operations
 - other issues
 - treats!

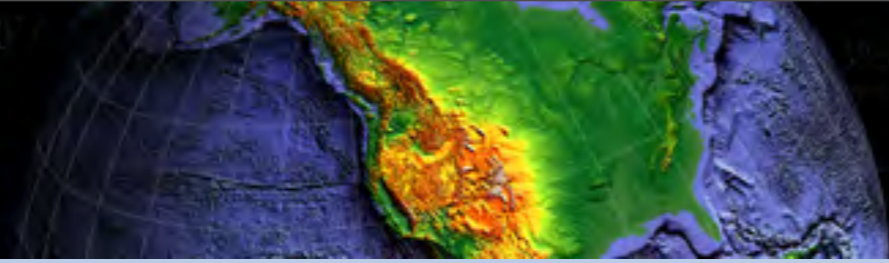
- High Quality Data
 - PDFs at DMC
 - Calibration
 - Data review
- Data completeness
 - 100% data return
- Event association
 - local, regional, teleseismic
 - locations and phase picks to DMC
 - phase picks to ISC
- Realtime
 - Ranks behind data completeness
 - No mandate for early warning
 - No seismic hazard assessment role
- Endusers
 - Science users
 - Education and outreach



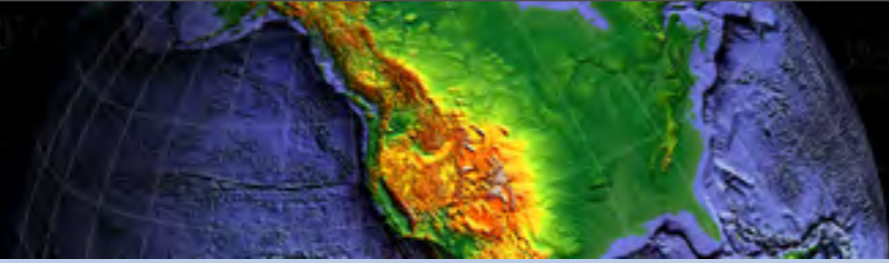
- High Quality Data
 - Excellent timing
 - Accurate metadata
 - orientation to $\sim 1^\circ$
 - Long continuous time series
 - Low noise stations
- Event processing
 - phase picks
 - locations (local, regional)
 - associations (local, regional, teleseismic)
 - magnitudes



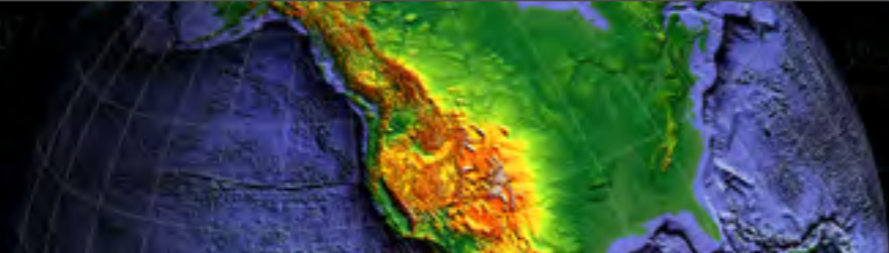
- Realtime
 - orbdetect
 - orbassoc
 - dborigin2db
 - orbevproc
- Post processing
 - dbloc2
 - locate with dblocsat
 - associate with external catalogs
 - dbbevproc
 - associations
 - magnitudes
 - no flagging of blasts, sonic, atmospheric, etc.
- End users
 - Science community
 - IRIS DMC
 - Special studies for USGS, IRIS, ...



- UCSD
 - seismic waveforms
 - event parametric data
 - metadata
 - soh waveforms
- DMC
 - seismic waveforms
 - event parametric data
 - metadata
 - soh waveforms
- ISC
 - phase picks



- Antelope platform for data analysis
 - Antelope APIs
 - contrib
- Matlab interface
 - exploratory prototyping
 - testing



5 Year Vision

294 sites

85 km grid

