

Antelope User Group Meeting Trieste

University of Trieste
Trieste, Italy
29-30 November 2004

Frank Vernon
BRTT

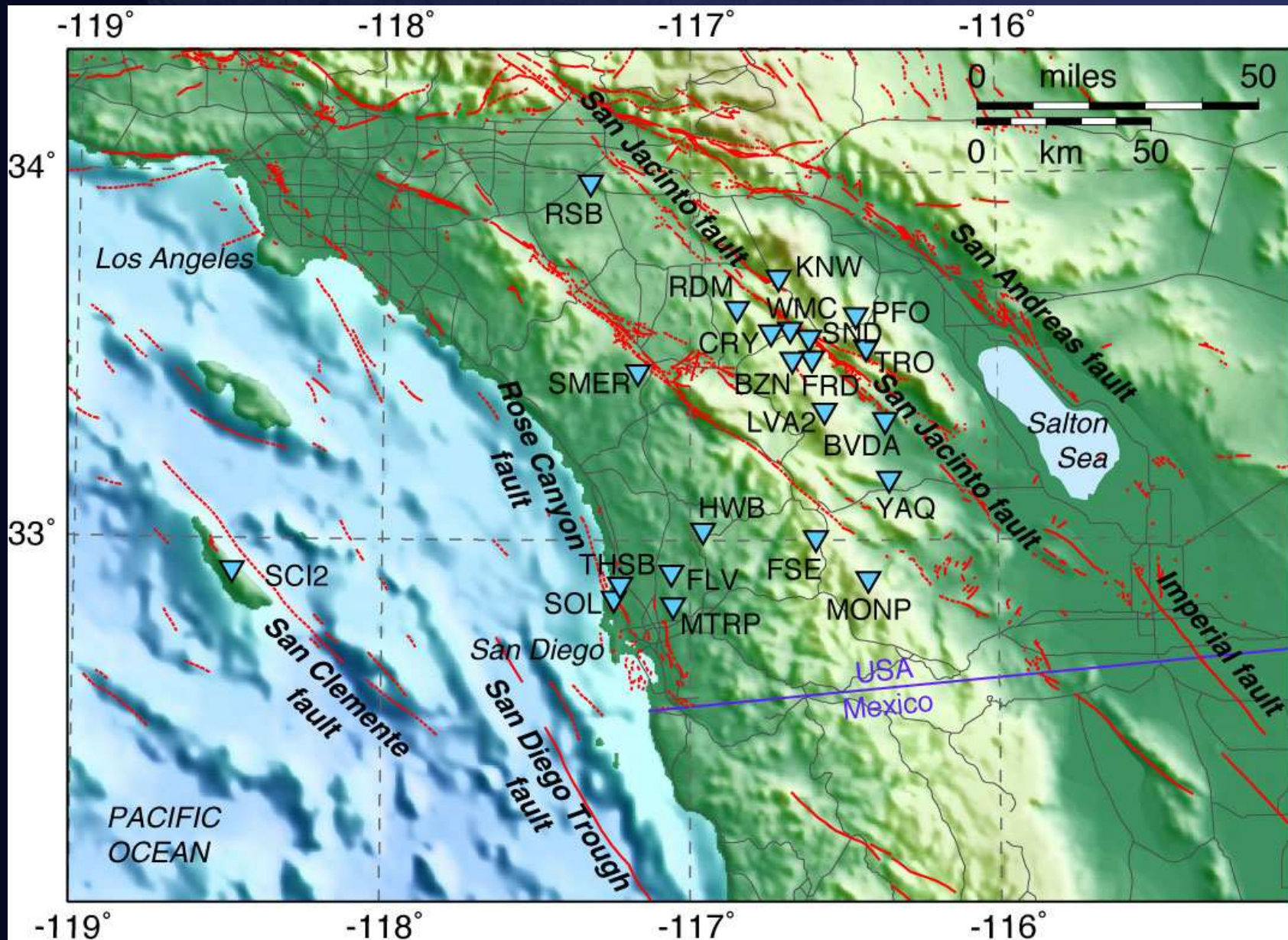


Overview

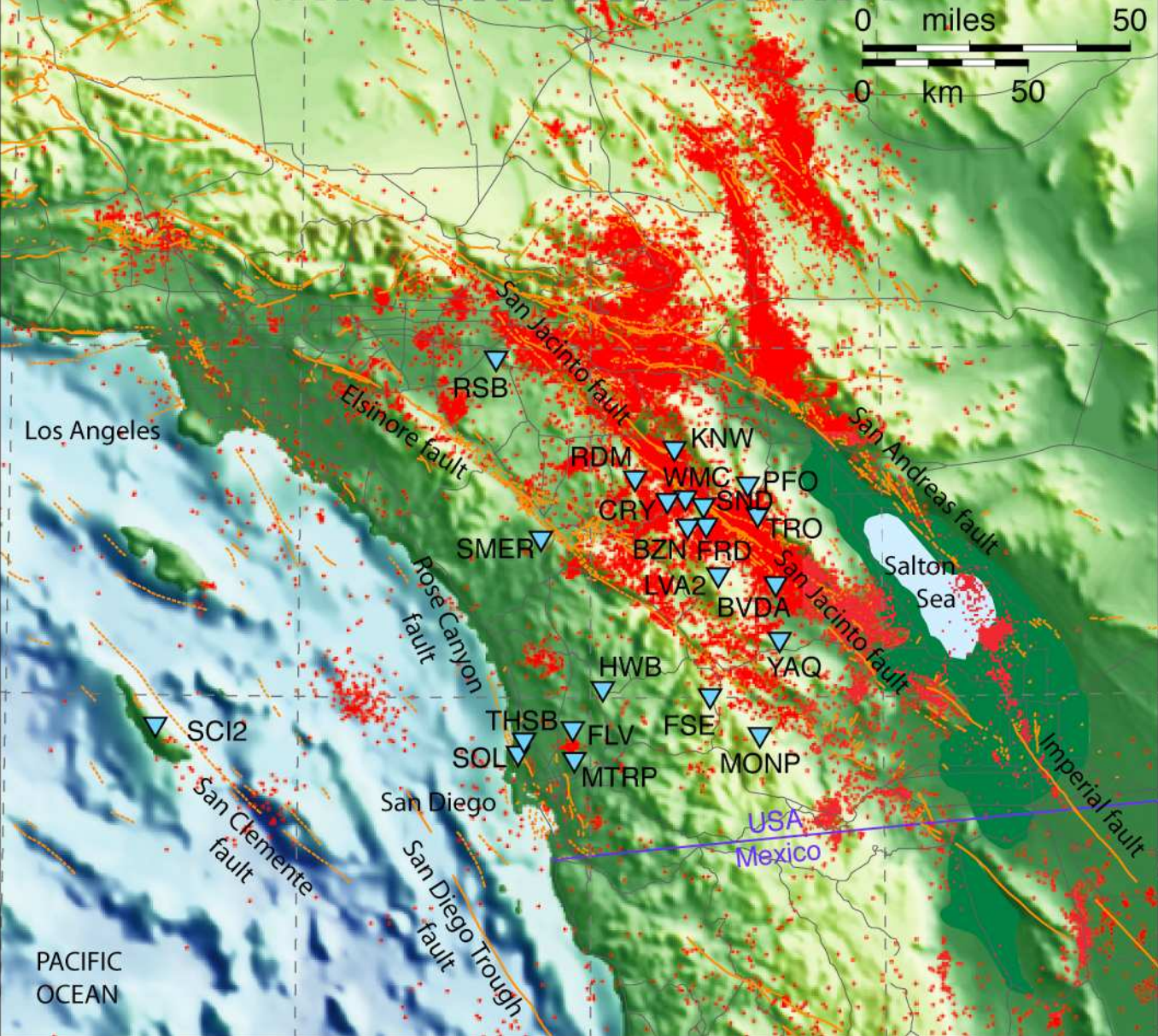
- Frank Vernon
 - Instruments and Response information
 - Data exchange
 - ROADNet
 - System Monitoring
- Dan Quinlan
 - Antelope 4.5, 4.6, 4.7
 - Dbbuild
 - Example PERL script
- Jennifer Eakins
 - RT system and dbmaster configuration
 - Rtexec.pf
 - Waveform backups
- Kent Lindquist
 - New Antelope interfaces
 - Web displays
 - Map preparation
 - XML



ANZA Seismic Network



Earthquakes recorded by ANZA Network



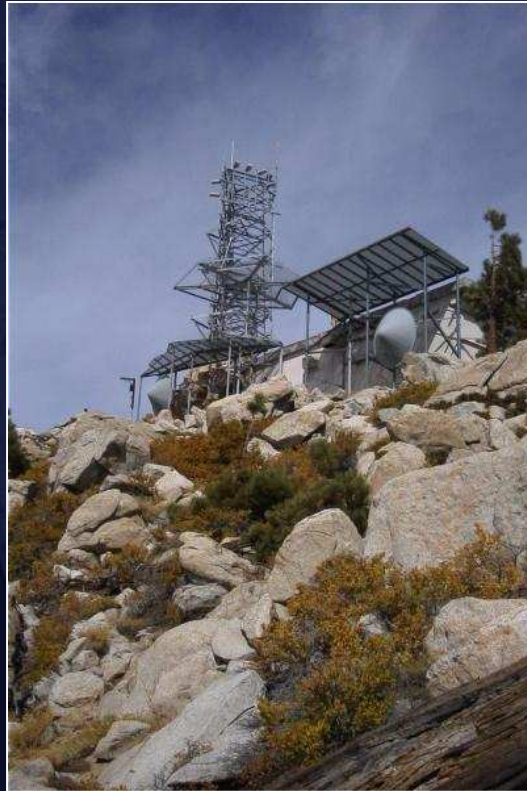
Connecting seismic data to the world



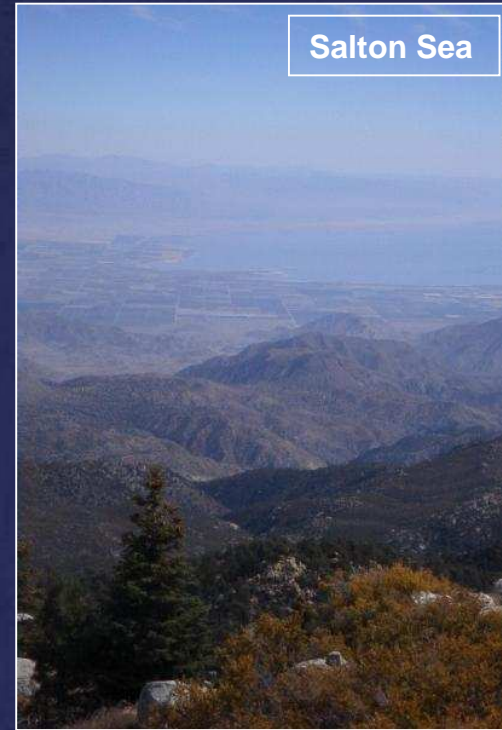
Central Telemetry Site - Toro Peak

Remote Seismic Station

Toro Peak 8700'



Salton Sea



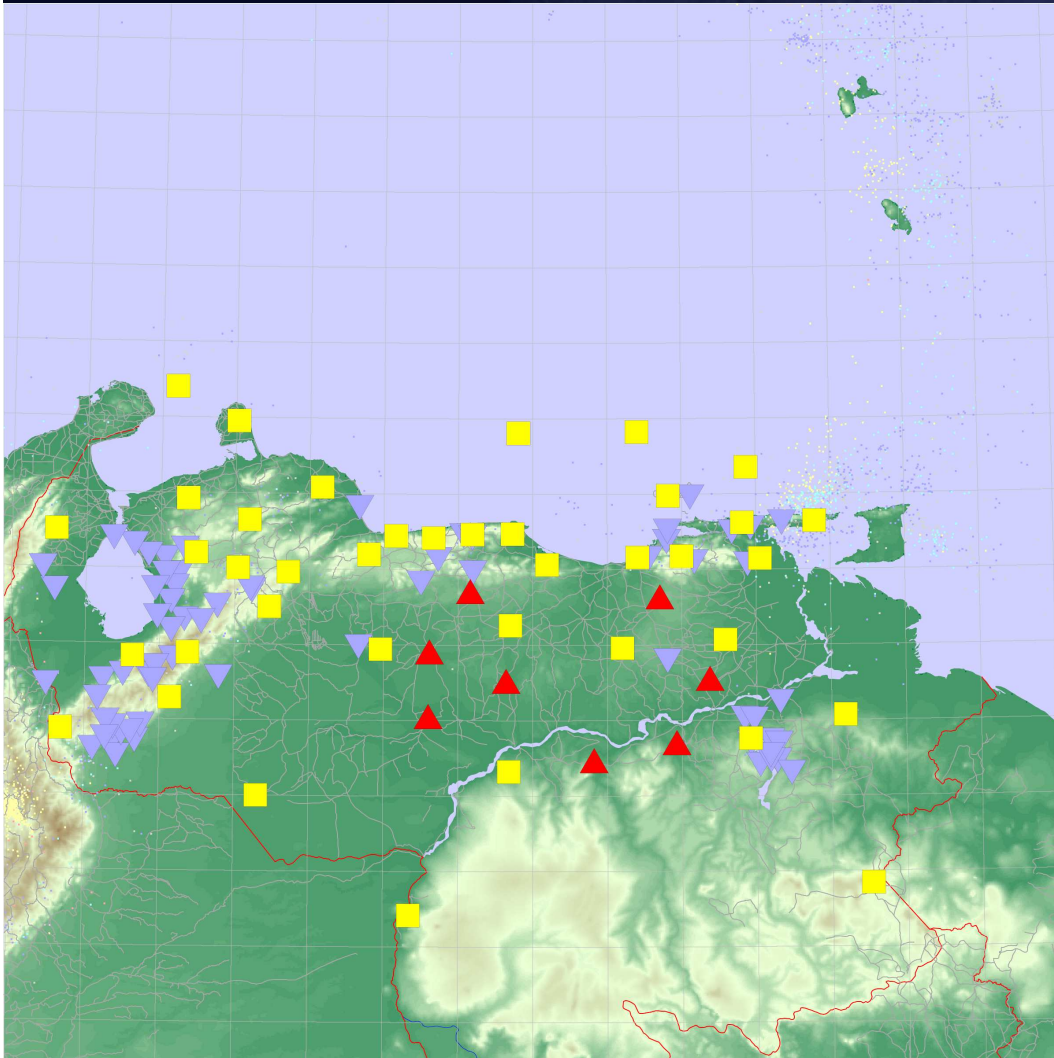
Pinyon Flats



Boyd Deep Canyon

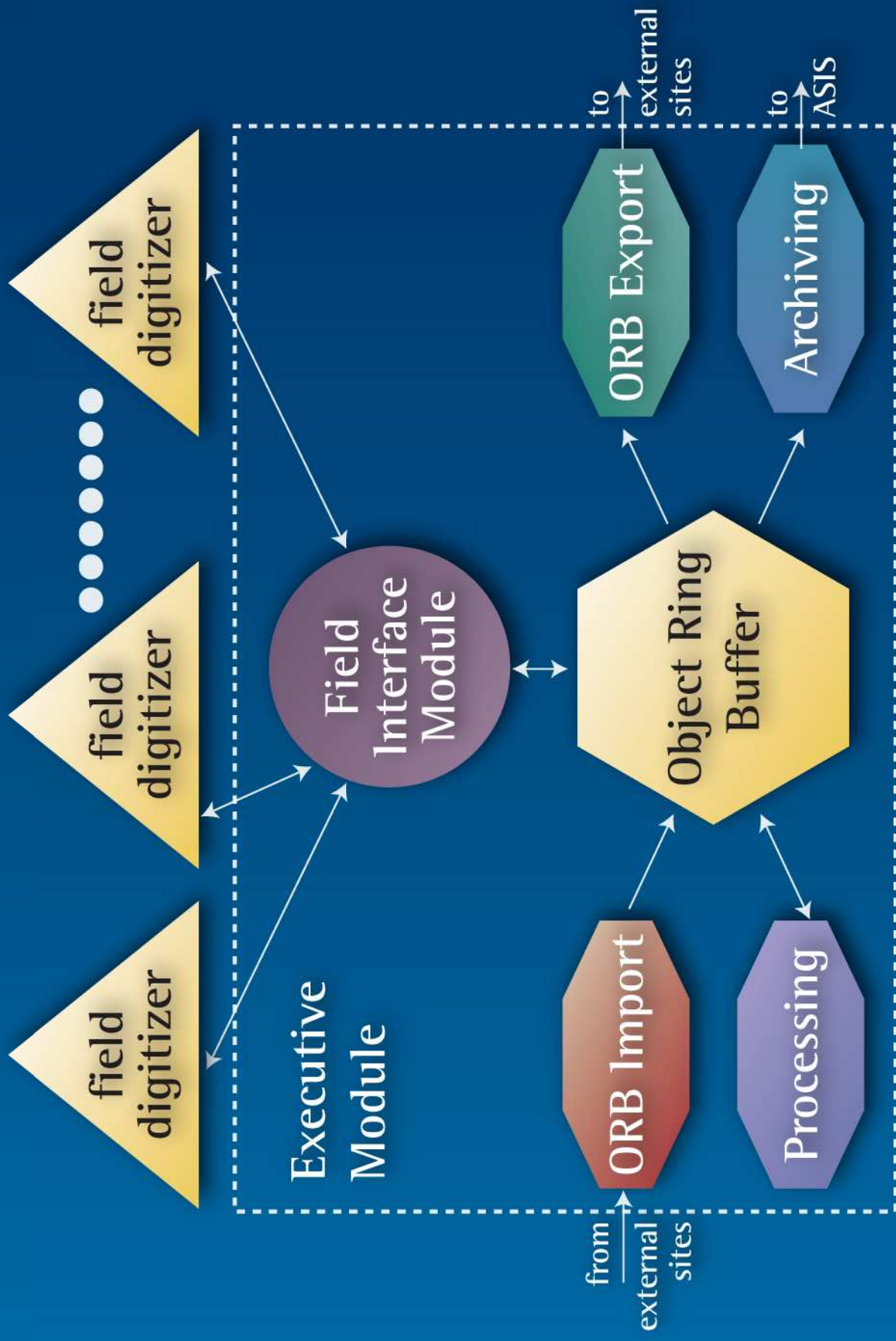


Caribbean CD Experiment



- 20+ PASSCAL Q330s w/ BB sensors
 - 18 to 24 months
- Spacenet Telemetry
- 15 OBS's
 - 15 months
- 30+ FUNVISIS BB stations
- 60+ Analog stations

Antelope Real-Time System



Data Flow for "Routine" Automated Seismic Network Processing: Single Associator

from real-time waveform data sources

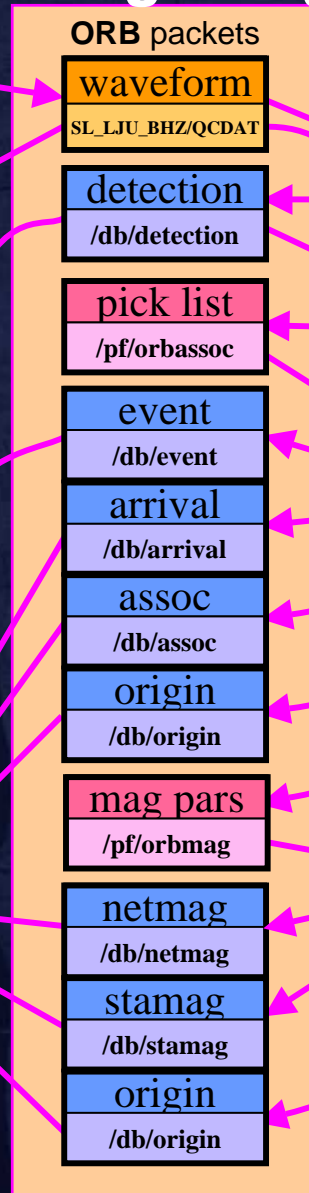
archives waveforms
populates wfdisc table

orb2db

archive database,
foreign keys

orb2dbt

populates all other tables



orbdetect

single channel event
detection and onset time
estimation

orbtrigger

crude event association
(time coincidence based)

ttgrid

travel time
grid

orbassoc

travel time-back
projection based
associator
(grid search for
candidate hypocenters)

id
server

orbmag

computes magnitude estimate

foreign
keys



USArray Prototype Station



400 Broadband Stations in Transportable Array

200 Broadband Stations in Flexible Array



**Optional
GPS**

Photos courtesy of Marcos Alvarez
IRIS PASSCAL Instrument Center

q3302orb

- Many changes included in patches to the 4.5 version:
 - Many bug fixes on original version
 - Changes to support systematized generation of status waveform packets
 - Arbitrary time-channel packaging of output waveform data
- Integrate with new **dlmon** and **dlcmd**:
 - Support **dlcmd** `getconfig` command that will return a (nearly) complete configuration state in parameter file form
- Streamlined open/close and register/deregister
- Streamlined packet acknowledgements
- Automatically detect datalogger reconfiguration and cycle (close/deregister/reregister/open) any running data connections
- Convert to new **pktchannelcalib** tool
- Cellular phone connectivity



k22orb

- Integrate with new **dlmon** and **dlcmd**
- New command for erasing the Altus disk and running monitor commands
- Can specify “any” for **serial** and **model** parameters for point-to-point wired connections
- Convert to new **pktchannelcalib** tool
- Convert to new **orbreapthr** tool
- Support for continuous streaming data rates other than 100 sps (continuous sample rate is now specified in the parameter file)
- Streamlined initial startup for continuous connections
- User can specify the Altus streaming timeout parameter for continuous connections (this allows the user to put the datalogger into “mode 1” so that the data stream will never timeout)

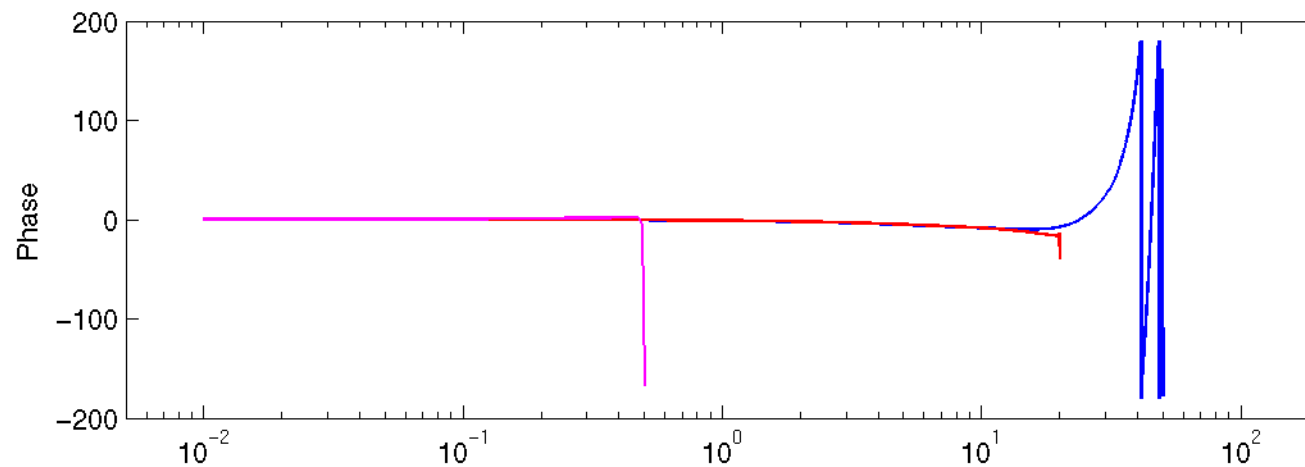
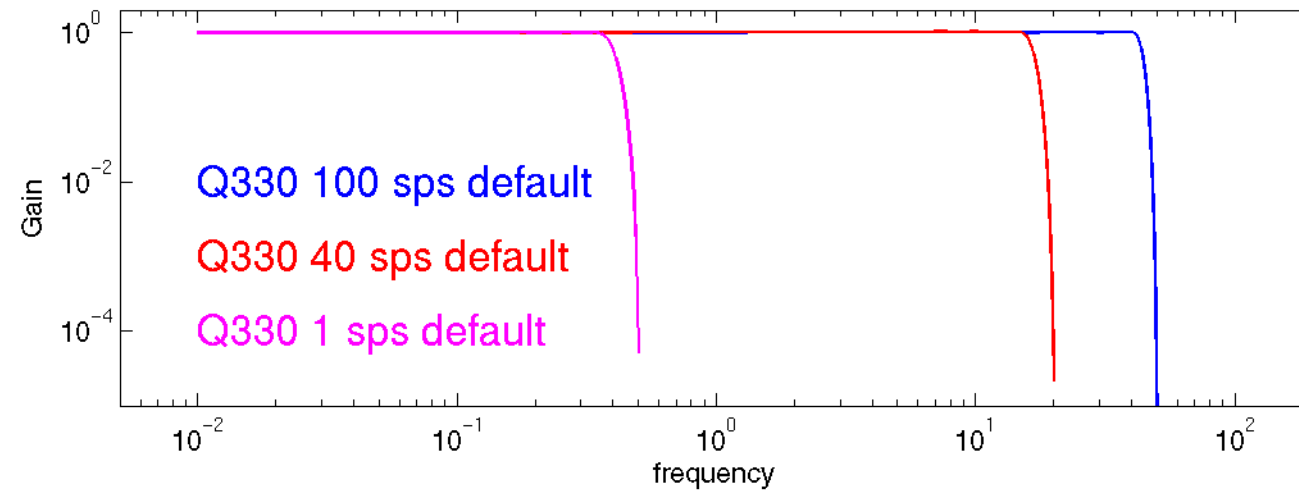


Q330

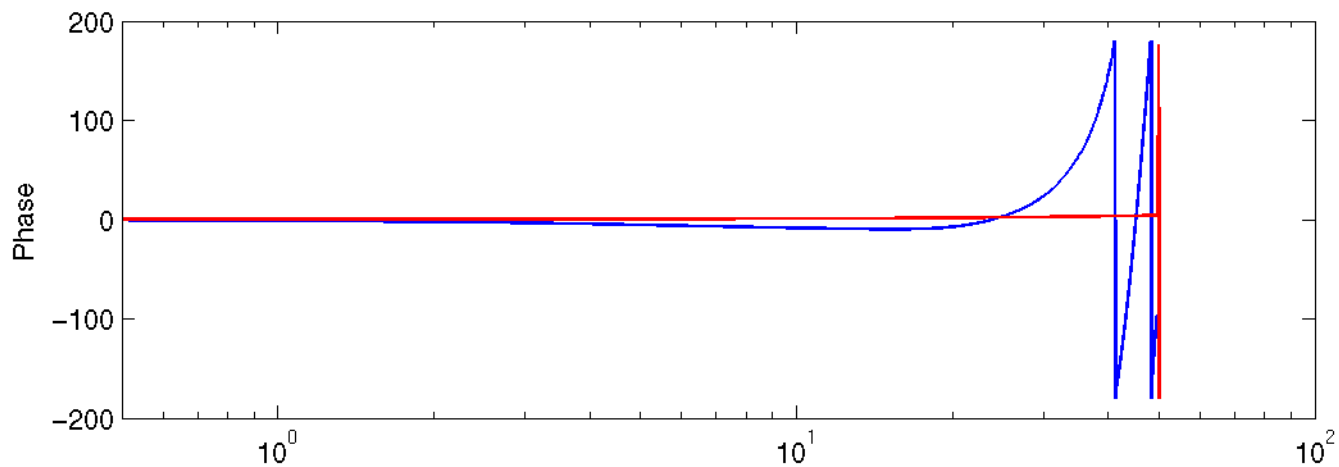
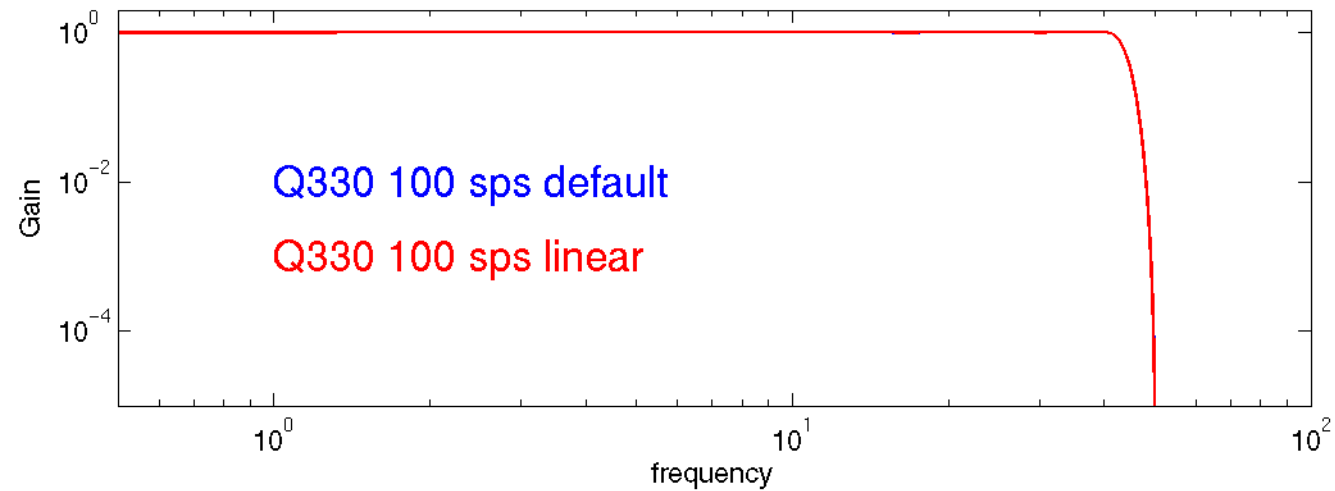
- Sample rates
 - 200, 100, 50, 40, 20, 10, 1 sps
 - 0.1 sps with baler
- Multiple data streams
 - Any combination allowed
- Filter and Decimation
 - Knowledge not allowed, considered proprietary
 - Composite filter responses provided
- Causal and Acausal filters



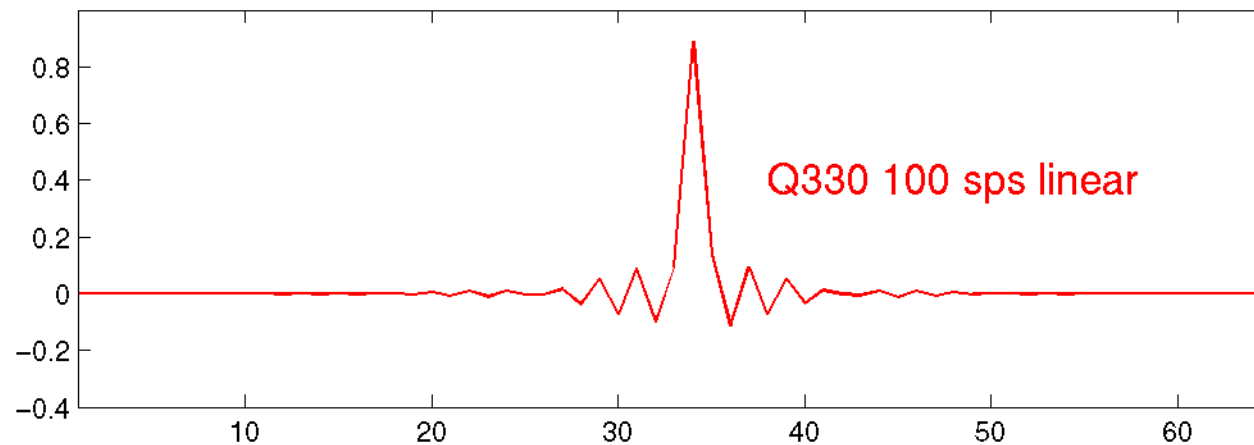
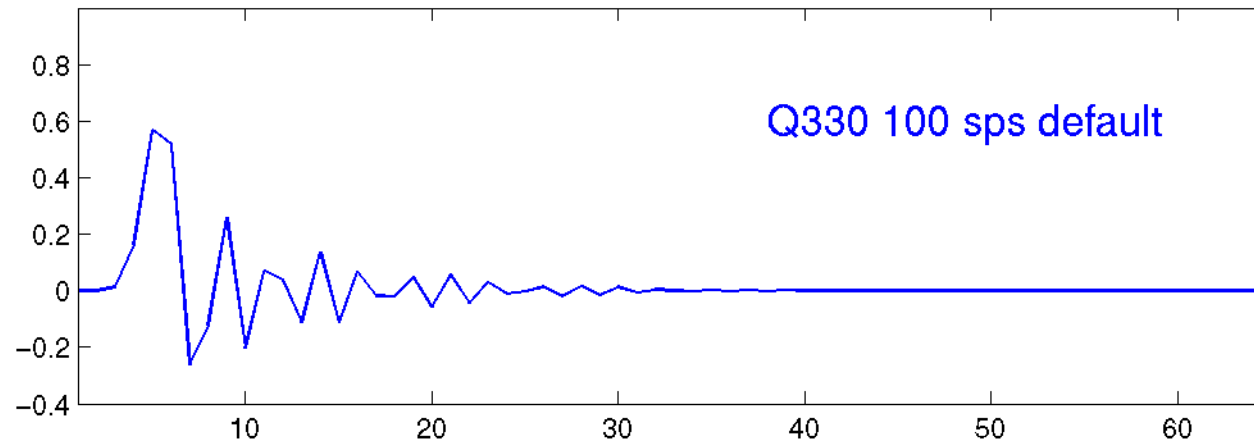
Q330 default response



Q330 default vs linear filters



Q330 composite filters



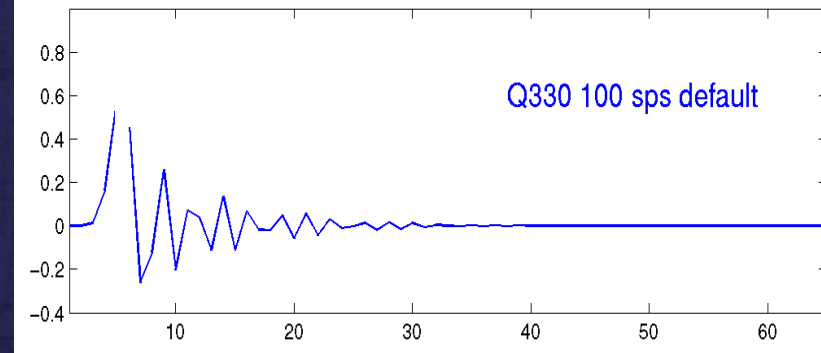
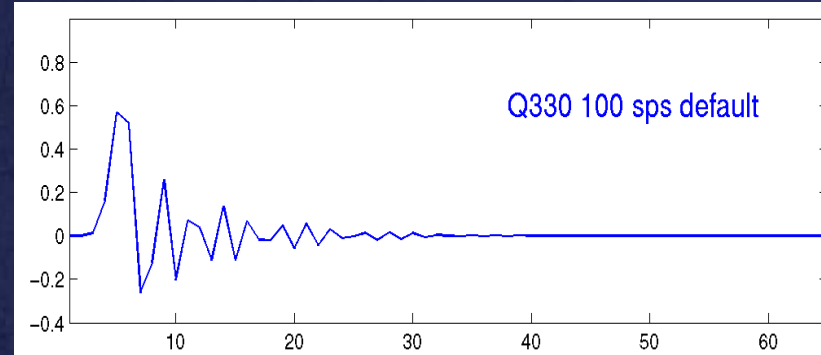
Perils of virtual networks

- Every datalogger different
- A/D's
 - Crystal
 - Reftek, KMI, Guralp, Ida, etc.....
 - Proprietary
 - Quanterra, Nanometrics
- FIR Filters
 - Zero Phase Filters
 - Reftek, Quanterra, KMI, Gurlap, Ida, Nanometrics
 - Causal
 - Quanterra, KMI



Idiosyncracies

- Quanterra
 - Variable A/D constants by channel
 - Q680, Q4120, Q730
 - Home brewed filters allowed
 - Q680, Q4120, Q730
 - Q330 default
 - Causal to 100 sps
 - Acausal below
 - FIR coeffs distributed in reverse **time** order



- Asymmetric fir coeff now distributed in **forward time** order

Idiosyncracies

- Guralp
 - Differential or Single ended inputs
- Nanometrics
 - Variable A/D gains
 - FIR Filters
 - 6 decimation rates
 - 9 decimate by 5 filters in specification
 - 6 unique decimate by 5 filters



Datalogger descriptions

- Reftek
 - RT24, RT72A-0[2678], RT97, RT130
- Gurlap
 - DM24, PEPP
- UCSD
 - Ida Mark 8
 - Lcheapo 2000
- Quanterra
 - Q4120, Q730, Q330
 - Q680 needed for USARRAY
- KMI
 - Altus, K2, Makalu
- Nanometrics
 - Trident
- Canadian
 - GD-1



Sensor Descriptions

- Streckeisen
 - STS1, STS2
- Mark Products
 - L4, L22, L28
- KMI
 - Episensor, FBA-23, Ranger
- Geospace
 - HS10
- Guralp
 - CMG3T, CMG3ESP, CMG3ESP_NSN, CMG40T
- Geotech
 - KS54000, S6000
- Terratech
 - FBA



Realtime Dataserver Imports to Antelope

BRTT supported

- Orbserver
- CD1.0
- Comserv
- AutoDRM

Contributed

- LISS
- NRTS
- Earthworm
- Scream
- Seedlink
- RTPD (Reftek)



Realtime Dataserver Exports from Antelope

BRTT supported

- Orbserver
- CD1.0
- AutoDRM

Contributed

- Mshear
- Earthworm
- Seedlink
- Multicast
- Socket



Antelope Packet types

- waveform packet
 - many types
 - non multiplexed data
 - multiplexed data
- status packet
- database row
- parameter file
- control messages
- arbitrary binary data, wrapped in orb packet
 - images
 - codar
 - Ashtech MBEN
 - Lycra
- arbitrary character string
 - log files
- test packet



Antelope Datalogger Modules

BRTT supported

- Quanterra
 - Q380, Q680, Q980
 - Q4120
 - Q730, Q730B
 - Q330
- Kinematics
 - K2
 - Etna
 - Makalu
 - Mt. Whitney
 - Everest
- Reftek
 - RT130

Contributed

- Reftek
 - RT72A-08, RT72A-07
 - RT130
- Earthworm Digitizer
- Guralp
- Campbell
- Davis
- Oregon Scientific
- ICE-9
- NEMA Encoding
- Ricoh cameras
- MBEN GPS
- Webcameras
- SeaBird
- CODAR



Antelope Sensor Types

- Seismometers
- Accelerometers
- Displacement
- Barometric pressure
- Temperature
- Wind Speed
- Wind Direction
- Infrasound
- Hydroacoustic
- Differential Pressure Gauges
- Strain
- Solar Insolation
- pH
- Electric Current
- Electric Potential
- Dilution of oxygen
- Still Camera Images
- Codar



Dlmon - Station SOH monitor

dlmon: mercali:status mercali:status

Ejle

sta	SLT	runtm	dr	temp	volt	lat	lon	elev	gps	gps	clck	cldr	cltncy	dgp	dltncy
AZ_SCV2	0m		0												
SB_GVD00	0m														
TA_Y22C	0m		0											0s	
AZ_B2N	0m	2d	9.1k	32C	13.3V	33.492	-116.667	1316m	offp	If	H	-1us	32m	0s	2s
AZ_GVDA	0m	1d	5.3k	23C	14.2V	33.669	-116.674	1310m	offp	If	H	3us	55m	0s	1s
AZ_HWB	0m	1h	4.7k							3D	T	-2.5s	29s		3s
AZ_SCV1	0m	1h	2.9k			33.612	-116.460	1284m		3D			26s		
AZ_SOL	0m	1h	11k							3D	L	-54us	26s		5s
CL_RSB	0m	1h	11k							3D	L	16us	27s		5s
CL_RSS	0m	1h	12k							3D	L	62us	26s		4s
K1361	0m	1d	11k	39C	12.2V	33.669	-116.674	1293m	on	L	IG	0us	2m	0s	1s
K1362	0m	1d	12k	41C	11.6V	35.123	-89.933	73m	on	L	IG	0us	2m	1m	1s
K1363	0m	1d	11k	46C	12.0V	34.380	-85.714	239m	off	If	IG	0us	9m	0s	1s
K1365	0m	1d	11k	42C	11.8V	35.123	-89.933	73m	off	If	IG	0us	17m	0s	1s
K1366	0m	1d	11k	37C	11.8V	35.123	-89.933	73m	off	If	IG	0us	19m	0s	1s
K1367	0m	1d	12k	37C	12.1V	35.123	-89.933	73m	off	If	IG	0us	21m	0s	1s
K1368	0m	1d	11k	46C	12.1V	35.123	-89.933	73m	off	If	IG	0us	21m	0s	1s
K1947	0m	1d	12k	39C	12.3V	35.123	-89.933	73m	off	If	IG	0us	16m	0s	1s
K1948	0m	1d	11k	40C	12.0V	35.123	-89.933	73m	off	If	IG	0us	9m	0s	1s
K709	0m	1d	12k	39C	12.2V	33.666	-116.707	1307m	off	If	IG	0us	9m	2m	1s
SB_GVA01	0m	1d	12k	25C	13.9V	33.669	-116.674	1318m	offp			3us		0s	1s
SB_GVA02	0m	1d	15k	26C	13.9V	-0.000	-0.000	0m	ra			0us		0s	1s
SB_GVA03	0m	1d	15k	26C	13.9V	33.669	-116.674	1311m	offp			3us		0s	1s
SB_GVA04	0m	1d	19k	25C	13.8V	33.669	-116.674	1313m	offp			3us		0s	1s
SB_GVA05	0m	1d	7.6k	23C	13.9V	33.669	-116.674	1309m	offp			4us		0s	1s
SB_GVA06	0m	1d	14k	24C	14.1V	33.669	-116.674	1307m	offp			3us		0s	1s
SB_GVDA	0m	1d	19k	23C	14.2V	33.669	-116.674	1310m	offp			3us		0s	1s
TA_109C	0m	2d	3.2k	34C	13.3V	32.889	-117.105	167m	offp	If	H	3us	53m	0s	1s
TA_HAST	0m	49m	3.0k	30C	12.8V				offp	If	H	4us	55m	0s	6s
ZV_GV01	0m	1d	6.9k	38C	12.6V	33.668	-116.672	1314m	offp	If	H	0us	43m	0s	1s
ZV_GV02	0m	1d	5.0k	31C	12.9V	33.667	-116.670	1315m	offp	If	H	0us	55m	0s	1s
ZV_GV03	0m	1d	5.0k	35C	12.6V	33.664	-116.668	1313m		3D	L	1us	0s	0s	2s
ZV_GV04	0m	1d	5.2k	40C	12.9V	33.663	-116.668	1313m	offp	If	H	1us	55m	0s	2s
ZV_GV05	0m	1d	5.2k	35C	12.6V	33.663	-116.668	1311m	offp	If	H	-1us	47m	0s	2s
ZV_GV06	0m	1d	4.8k	35C	13.1V	33.662	-116.668	1314m	offp	If	H	0us	15m	0s	2s
ZV_GV07	0m	1d	5.0k	33C	12.9V	33.663	-116.666	1313m	offp	If	H	0us	46m	0s	1s
ZV_GV08	0m	1d	5.0k	32C	12.6V	33.665	-116.663	1313m		3D	L	3us	0s	0s	1s
ZV_GV09	0m	1d	5.8k	33C	12.6V	33.659	-116.667	1317m		3D	L	1us	0s	0s	2s
ZV_GV10	0m	1d	6.3k	35C	12.8V	33.659	-116.667	1316m		3D	L	1us	0s	0s	2s
ZV_GV11	0m	1d	6.4k	34C	12.8V	33.659	-116.667	1318m		3D	L	0us	0s	0s	1s
ZV_GV12	0m	1d	5.1k	36C	12.8V	33.661	-116.662	1335m	offp	If	H	0us	35m	0s	1s
ZV_GV13	0m	1d	4.7k	37C	12.6V	33.662	-116.662	1320m	offp	If	H	0us	25m	0s	1s
ZV_GV14	0m	1d	5.1k	37C	12.6V	33.661	-116.661	1316m		3D	L	0us	0s	0s	1s
ZV_GV15	0m	1d	5.1k	38C	12.6V	33.665	-116.658	1317m		3D	L	1us	0s	0s	1s
ZV_GV16	0m	1d	5.0k	36C	12.9V	33.665	-116.657	1317m		3D	L	0us	0s	0s	1s
ZV_GV17	0m	1d	5.1k	35C	12.8V	33.666	-116.657	1317m		3D	L	3us	0s	0s	1s
ZV_GV18	0m	1d	5.4k	37C	12.9V	33.666	-116.655	1312m	offp	If	H	3us	55m	0s	2s
ZV_GV19	0m	1d	5.6k	40C	12.6V	33.669	-116.653	1332m		3D	L	1us	0s	0s	1s
ZV_GV20	0m	1d	5.0k	36C	12.9V	33.665	-116.666	1310m	offp	If	H	3us	43m	0s	1s

ALL STATIONS

Status: Time: 2004234(8/21) 1:02:41 UTC



Nagios - System SOH

Nagios

http://mercali.ucsd.edu/nagios/

Apple .Mac Amazon eBay Yahoo! News

Nagios®

General

- Home
- Documentation

Monitoring

- Tactical Overview
- Service Detail
- Host Detail
- Hostgroup Overview
- Hostgroup Summary
- Hostgroup Grid
- Servicegroup Overview
- Servicegroup Summary
- Servicegroup Grid
- Status Map
- 3-D Status Map
- PerfData Graphs
- Service Problems
- Host Problems
- Network Outages

Show Host:

- Comments
- Downtime
- Process Info
- Performance Info
- Scheduling Queue

Reporting

- Trends
- Availability
- Alert Histogram
- Alert History
- Alert Summary
- Notifications
- Event Log

Configuration

- View Config

Network Map For All Hosts
Last Updated: Fri Aug 20 18:06:31 PDT 2004
Updated every 90 seconds
Nagios® - www.nagios.org
Logged in as *flv*

[View Status Detail For All Hosts](#)
[View Status Overview For All Hosts](#)

Layout Method: Circular (Marked Up)

Scaling factor: 0.6

Drawing Layers:

- ANZA equipment
- GVDA Equipment
- Glen Offield equipment
- HPWREN equipment

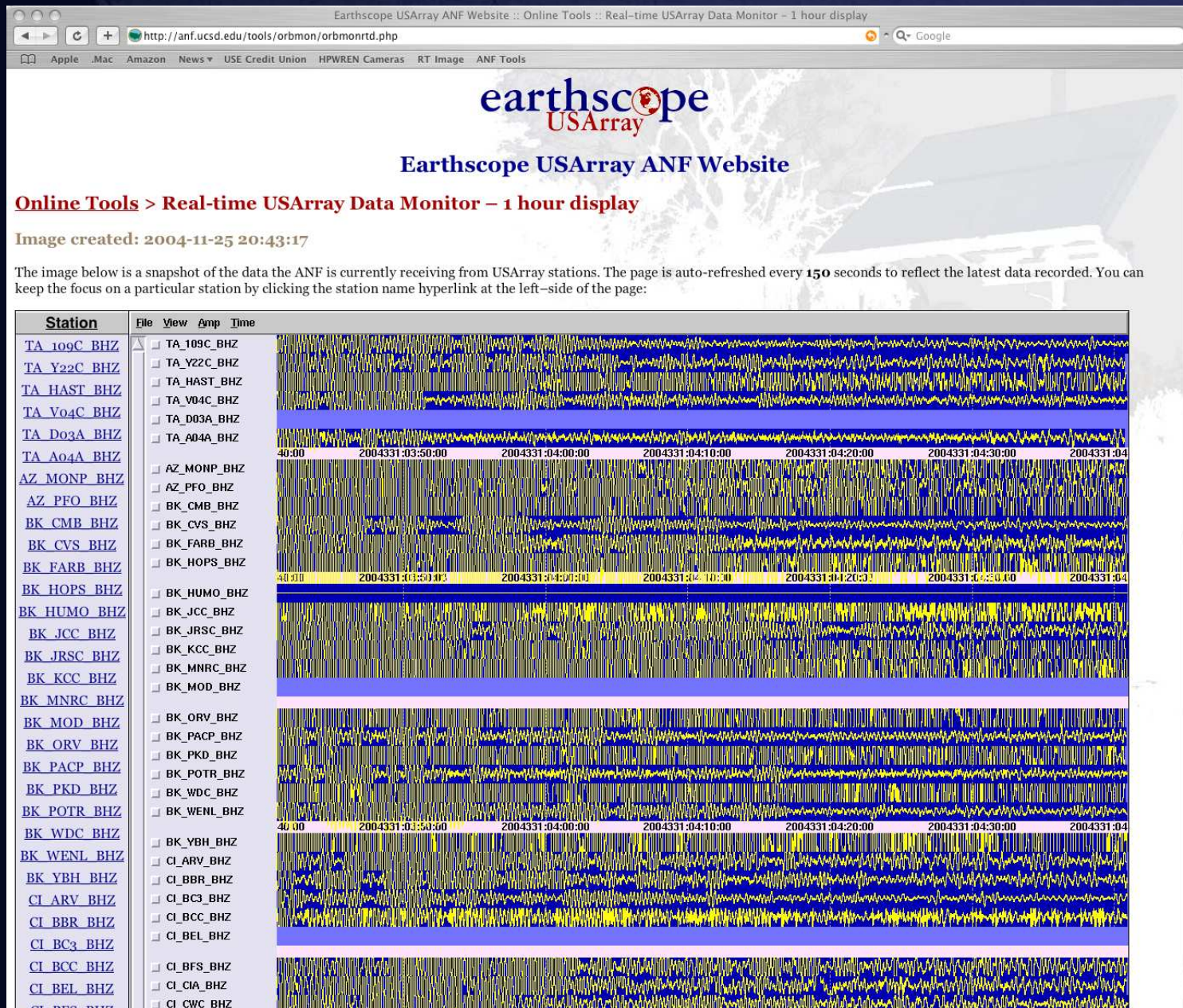
Layer mode:

- Include
- Exclude

Supress popups:

ROADNet

Orbmonrtd - Data SOH



Orbmonrtd - Data SOH

Earthscope USArray ANF Website :: Online Tools :: Real-time USArray Data Monitor - 24 hour display

http://anf.ucsd.edu/tools/orbmon/orbmonrtd24.php

Apple Mac Amazon News USE Credit Union HPWREN Cameras RT Image ANF Tools

earthscope
USArray

Earthscope USArray ANF Website

Online Tools > Real-time USArray Data Monitor - 24 hour display

Image created: 2004-11-25 20:47:34

The image below is a snapshot of the last 24 hours of data the ANF is currently receiving from USArray stations. The page is auto-refreshed every 150 seconds to reflect the latest data recorded. You can keep the focus on a particular station by clicking the station name hyperlink at the left-side of the page:

Station	File	View	Amp	Time
TA_109C_BHZ	<input type="checkbox"/> TA_109C_LHZ			
TA_Y22C_BHZ	<input type="checkbox"/> TA_Y22C_LHZ			
TA_HAST_BHZ	<input type="checkbox"/> TA_HAST_LHZ			
TA_V04C_BHZ	<input type="checkbox"/> TA_V04C_LHZ			
TA_D03A_BHZ	<input type="checkbox"/> TA_D03A_LHZ			
TA_A04A_BHZ	<input type="checkbox"/> TA_A04A_LHZ			
AZ_MONP_BHZ	<input type="checkbox"/> AZ_MONP_LHZ			
AZ_PFO_BHZ	<input type="checkbox"/> AZ_PFO_LHZ			
BK_CMB_BHZ	<input type="checkbox"/> BK_CMB_LHZ			
BK_CVS_BHZ	<input type="checkbox"/> BK_CVS_LHZ			
BK_FARB_BHZ	<input type="checkbox"/> BK_FARB_LHZ			
BK_HOPS_BHZ	<input type="checkbox"/> BK_HOPS_LHZ			
BK_HUMO_BHZ	<input type="checkbox"/> BK_HUMO_LHZ			
BK_JCC_BHZ	<input type="checkbox"/> BK_JCC_LHZ			
BK_JRSC_BHZ	<input type="checkbox"/> BK_JRSC_LHZ			
BK_KCC_BHZ	<input type="checkbox"/> BK_KCC_LHZ			
BK_MNRC_BHZ	<input type="checkbox"/> BK_MNRC_LHZ			
BK_MOD_BHZ	<input type="checkbox"/> BK_MOD_LHZ			
BK_ORV_BHZ	<input type="checkbox"/> BK_ORV_LHZ			
BK_PACP_BHZ	<input type="checkbox"/> BK_PACP_LHZ			
BK_PKD_BHZ	<input type="checkbox"/> BK_PKD_LHZ			
BK_POTR_BHZ	<input type="checkbox"/> BK_POTR_LHZ			
BK_WDC_BHZ	<input type="checkbox"/> BK_WDC_LHZ			
BK_WENL_BHZ	<input type="checkbox"/> BK_WENL_LHZ			
BK_YBH_BHZ	<input type="checkbox"/> BK_YBH_LHZ			
CI_ARV_BHZ	<input type="checkbox"/> CI_ARV_LHZ			
CI_BBR_BHZ	<input type="checkbox"/> CI_BBR_LHZ			
CI_BC3_BHZ	<input type="checkbox"/> CI_BC3_LHZ			
CI_BCC_BHZ	<input type="checkbox"/> CI_BCC_LHZ			
CI_BEL_BHZ	<input type="checkbox"/> CI_BEL_LHZ			
CI_BFS_BHZ	<input type="checkbox"/> CI_BFS_LHZ			
CI_CIA_BHZ	<input type="checkbox"/> CI_CIA_LHZ			
CI_CWC_BHZ	<input type="checkbox"/> CI_CWC_LHZ			

