MULTI-USE MULTI-USER COLLABORATIVE RESOURCES
STATION -> NETWORK -> FEDERATION

Intentions and un-intended consequences

- **Station**
  - Exchange phases, records
    - WWSSN / ISC model - film-chips, bulletins, catalogs
  - Collaborate on experiments

- **Regional/National Networks**
  - Exchange event data
  - Real time streaming
  - Archival access through common data center (IRIS)

- **Federation**
  - “Formal” federations
    - FDSN - IRIS – Full/restricted access
    - NEIC – real time monitoring
  - Contributed data

- **Station**
  - Individual and institutional interests
  - WWSSN – nuclear monitoring
  - Global seismology and plate tectonics

- **Regional/National Networks**
  - National e’quake monitoring needs
  - Enhanced research applications
  - Global exchange and standardization

- **Federation**
  - Global tomographers and USGS
  - Free and open data exchange
  - Enhanced scientific and technical exchanges
BEYOND NETWORKS AND FEDERATIONS

“Networks without borders”
- Common interests - research and hazard applications
- Continental Scale
- Project and processes beyond national boundaries
- Mutual support for growth and enhancement
- Commitment to
  - Common standards
  - Open data exchange

Opportunity for seismology to lead in open scientific collaborations
- Seismology as a global and international science
If we assume (from USArray/TA, CEUSN, CNS etc)

- $50-100K/station hardware, installation materials
- $20-50K/station/year data collection only (not analysis or processing)

50 station network
- $2.5 – $5.0 M capital investment
- $1.0 – $2.0M annual operational cost

100 station network
- $5 – $10M capital investment
- $2 – $5 M annual operational cost
REALITY CHECK

- **GRO-Chile Budget**
- **10 station backbone network**
  - BB seismic, strong motion, infrasound, metpack
- **Total budget $1.4M**
  - $1M from NSF + $400K cost share from UChile
  - 10 stn network and 3 yrs shared O&M
  - 10 * $50K + 3*10*$30K
  - $500K + $900K
  - $1.4M
NOMINAL COSTS

- 100 station network
  - $5 – $10M capital investment
  - $2 – $5 M annual operational cost

Large investments
- well outside the funding level for individual PI projects
- possible in highly competitive realm of “big science”
But - -
- not significant in major national infrastructure development
- not significant in cost of response to major disasters
And
- most appropriate for funding from multi-use, multi-sector support for hazard mitigation/response and research.
Challenges and Opportunities

- Engage and inform policy makers
- Encourage balance between research and mission activities
- Listen to lessons from the past
  - Implement phased development
  - Utilize appropriate and stable technology
  - Prepare, sustain and follow through
- Leverage diversified support
- Set standards and encourage mutual collaboration
  - Encourage open data exchange
- Seek productive collaborations – internal and external
  - Develop collaboration that are bilateral and symmetric
- Evolve the focus from:
  - Hardware → to quality data → to knowledge → to practice