Scientific questions offshore complement of USArray could address

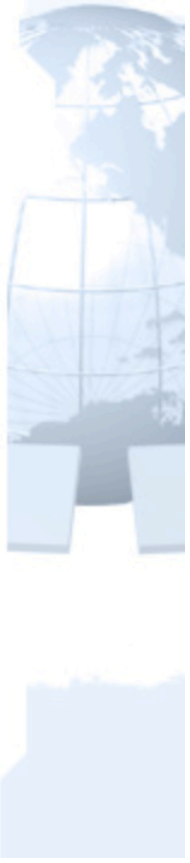
- Crustal Transition - Oceanic to Continental
  - How does transition zone behave from oceanic crust to continent
  - Provide constraint for radial involvement to mantle flow
  - Understanding the variations strength of the lithosphere
  - What is the thermal structure
  - Can we learn anything about fluids?
- Mantle structure underneath the San Andreas transform boundary
  - What is the mantle flow field and how does it relate to the surface deformation
  - Does transform boundary extend into the mantle
  - How does asthenosphere-lithosphere system change outboard of the SA fault
  - Flexible array deployments to map block rotation flow fields
  - Understanding background seismicity to define and characterize fault structure
  - Is there any evidence of obducted Farallon slab in offshore lithosphere
- Mendocino triple junction region
  - Flow field under Gorda and North American plates
  - Understanding seismicity distribution
  - Understanding the strength of the Pacific plate in the corner

Scientific questions offshore complement of USArray could address

- Ridge to Subduction zone on the JDF thru Cascades as a complement to Neptune
  - What is the transition between one tectonic environment to another
  - How does mantle flow change from one tectonic environment to another
  - Structural control over intraplate seismicity in the down going plate
  - Location of JDF subducting slab
  - Creation to destruction of oceanic plate
  - Width of mantle upwelling zone
  - What is the thermal structure of a young plate
- Transition from oceanic asthenosphere-lithosphere to continental tectosphere at the east and gulf coasts passive margin within NA plate
  - How does mantle flow change from oceanic asthenosphere as it meets the continental tectosphere
  - Does any of the oceanic asthenosphere survive under the tectosphere
  - Mantle structure from Mid-Altantic Ridge to tectosphere
  - Cooling of the thermal boundary layer - oldest oceanic crust?
  - Deepest compensated crust, lowest heat flow particularly the Gulf Coast
  - Surface waves

Scientific questions offshore complement of USArray could address

- Structure of Aleutian's mantle wedge
  - Thermal structure
  - Mantle flow in corner wedge
  - Interaction of subducted slab with transition zone
  - Examine upper mantle under extended continental crust (Bering Sea)
  - Is there a relationship between mantle flow field under Aleutians and block rotation
  - Along strike variation in coupling (Shumagin gap)
- Mantle flow associated with Queen Charlotte strike-slip fault and transition to subduction zone
- Gulf of California - Baja California
  - Obvious target for flexible array
- Great Lakes
  - Obvious extension to webfoot especially if eastern Canada is covered by broadband instruments at Grand Pied station spacing



Model for OMD complement to USArray

- Series of process oriented focused experiments simultaneous with USArray.
  - USArray model
- Coupled to the uniform deployment along all 4 coasts and Great lakes
  - Might be easier to sell
  - Is more appealing

Instrumentation

- Number of instruments in array
  - Webfoot
    - 150 instruments
    - 625 km offshore
    - 70 km station spacing
    - 2 deployments per coast
    - Buried broadband sensors
      - 75 days for deployment
      - 75 days for retrieval
      - 15-18 months
    - Need UNOLS large ships
  - Flexible
    - 50 instruments
    - Experiment driven durations, station locations, etc
    - Buried broadband sensors when used

Instrumentation

- Technical Requirements
- Webfoot
  - Broadband
    - 8 mHz-16Hz
    - 40 sps, 1 sps
    - Buried
    - 3 component
  - Hydrophone
    - <125 Hz
- Flexible
  - Broadband
    - 8 mhz-40Hz
    - 100 sps, 40 sps, 1 sps
    - Buried
  - Short period
    - 1-100 Hz
  - Hydrophone
    - <125 Hz

Instrumentation

- Seascan clocks are sufficient
- Active orientation system
- Instrument development
  - Efficient burial system for broadband sensors
  - Orientation system
  - Are clock drifts linear?
- Method of selecting individual sites in an array
  - Local multibeam survey

Instrumentation

- When will instruments be needed
  - Webfoot concurrently deployed with Bigfoot
    - West Coast 2005-2007
    - Gulf Coast 2011-2012
    - East Coast 2013-2015
    - Alaska 2015-2017
  - Flexible arrays deployments determined through peer review process

Data management

- OMD Data Collection Center
  - Data quality control
  - Prepare waveforms and metadata
- Archive data at IRIS DMC
  - Data distribution
- Unrestricted data availability for all data

Management and Funding

- Management
  - Facilities management loosely coupled with scientific management
  - Flexible array use USArray workshops for experiment design
    - Individual PI experiments
  - Use OBSIP model?
  - Use RIDGE model?
  - Create new facility?
  - Paid staff, small office, works well
  - Coordinates with Earthscope
  - Coordinates community workshops
- Funding
  - Create new money
  - Design coherent program which will justify the use of future NSF funding augmentation
  - Sugar daddy

Webfoot Science

- Continental - Oceanic transitions
  - Strike slip boundaries
    - San Andreas Fault
    - Queen Charlotte Fault
  - Subduction zones
    - Cascadia
    - Alaska - Aleutians
  - Passive margins
    - Low heat flow, old oceanic crust
  - Strike-slip to subduction transition
    - Mendicino triple junction
    - Queen Charlotte - Alaska subduction
  - Strike-slip to spreading center
    - San Andreas to Gulf of California
  - 410 and 670 Transition zones