

What are the physical and chemical conditions that control subduction zone initiation and the development of mature arc systems?

- **Topic 1: Subduction initiation SI.**
 - Initial tectonic state
 - Subsequent evolution of kinematics, deformation, magma compositions
 - Early products of SI
- **Topic 2: 3D structure/ geometry/ rates/ magmatism over time.**
 - Evolution of subduction & magmatism in space and time in mature systems.

What programmatic elements require a “thematic” approach and what is the proper balance between this and primary site efforts?

- **Subduction initiation:**

- General consensus for thematic approach

- Only active SI is Puysegur Ridge, not likely to be a focus site in other groups & synergy with NZ partners.
- Simultaneous SI in Pacific (Tonga, IBM, Aleutians, Cascadia).
- Different end-members (induced vs spontaneous)
- Ophiolites (e.g. Josephine/Siletzia) as onshore site to map detailed structure of SI forearc.

What are the optimal Primary Sites for concentrated, collaborative investigations?

- **3D structure/geometry/rates/ magmatism:**
 - Could be adequately addressed at almost any of the likely focus sites (not ranked).
 - Aleutians
 - Cascadia
 - Comparisons to MARGINS sites (Costa Rica and IBM) or other ancillary sites (Tonga, Sumatra) could use a more thematic approach.

What specific types of experiments or observations are needed?

- **SI: Site dependent**

- Circum-Pacific

- Basic geology, geochemistry, geochronology, & 3D geophysics (crustal structure), stratigraphy (uplift extension history).
- Puysegur: also want imaging of the slab & geodetic (OB).

- Ophiolites:

- Basic geology, geochemistry, geochronology, petrology and deformation flow fabrics.

- **3D-T:**

- Structural geology and kinematic constraints on overriding plate deformation.
- Geology, geochemistry, geochronology of magmatism (extrusive/intrusive) for long time periods (10-50 my).
- Seismic observations of crustal structure.
- Use along-strike spatial variations as proxy for time evolution (Alaska-Aleutians?)

What is achievable in 3 to 5 years?

What is achievable in 10 years?

- **SI:**

- 3-5 yrs:

- new information about timing of SI in several circum-Pacific systems.

- Transects and/or large-scale mapping of ophiolites.

- 5-10 yrs:

- Puysegur ridge characterization (structure, sampling, drill core?? etc...)

- **3D:**

- 3-5 yrs: basic petrology, geochemistry of magmatism in space/time

- 5-10 yrs: seismic crustal structure (aleutians?); integration of data collected with geodynamic models.