

Original science plan questions:

- 1) How do erosion, sediment transfer, and deposition interact with deformation and subduction geometry during boundary evolution?
- 2) How do sediment dispersal patterns influence forearc evolution?

First-order question compelling science question: **What is the 4D inventory of sediment erosion, transport, deposition in subduction zones?**

This will help quantify and predict:

- i) Quantity, caliber, and composition of sediment delivered to various parts of the subduction zone
- ii) Exhumation and erosion rates at convergent margins
- iii) Long-term records of subduction processes in sedimentary basins

Links to other key topics:

- Geodynamic modelers want to know rates of exhumation and sediment influx into subduction zones
- Helps earthquake seismologists constrain ideas about how sediment influences the mechanics of subduction, e.g., plate coupling, fault behavior
- Volcanologists/petrologists need an understanding of sediment composition as it relates to volatile production and carbon cycling
- Important for fingerprinting and sediment diagenesis (i.e., what is the fate of sediment at different points in the subduction cycle?)
- Provides long-term record of volcanic growth, erosion, and magmatic flux
- Sedimentary record of fault initiation and growth in the forearc (paleoseismicity and sediment dispersal patterns)
- Record of subduction system response to climate and sea level changes

Highest priorities for sequestered GeoPRISMS program funds:

4D inventory of sediment erosion, transport, deposition in a subduction zone

Needs to be interdisciplinary, shoreline crossing

Need study area with some existing constraints (leverage previous work)

One focus site with along strike variation (or two end-member sites)