What governs the size, location and frequency of great subduction zone earthquakes and how is this related to the spatial and temporal variation of slip behaviors observed along subduction faults?

What controls the magnitude and recurrence interval of earthquakes?

What mechanical properties and/or fault zone conditions control the wide spectrum of slip rates observed on subduction megathrusts?

How to answer the questions: Implementation Activities

- Comparative Subductology
  - Generating a global slip deficit map (and everything)
- 4-D controlled source imaging and MT combined with passive seismic monitoring on a subduction zone with along-strike variability in slip behavior
- Seafloor geodesy encompassing regions of known large seismic slip
- Correlating exhumed fault zone structure with specific slip processes

- Measure the slip budget of secondary faults as a way to determine their role in complicating magnitude predictability
- Drilling into a seismogenic zone
- Paleoseismic history to determine segmentation persistence
- Laboratory measurements of frictional properties

Thematic Groups

- Comparative Subductology
  - Generating a global slip deficit map (and everything else)

- Exhumed fault zone structure & mechanical properties of megathrust materials.

Requirement of a Study Site

- Along strike variability in slip behavior
- Spectrum of slip behavior (tsunami EQ, creep, ETS & earthquakes)
- Well-known earthquake history
- Seismically active
- Geodetic accessibility
- Clear geological segmentation

Consensus Winners

	Along-strike slip behavior variability	Spectrum of slip (tsun., ETS, etc.)	Well-know EQ history	Geodetic accessibility	Clear geological segments	Infrastructure/ Baseline Info	Active Seismicity	Multiple stages of "seismic" cycle
Alaska	yes	yes	Historic Some paleo	Yes	yes	Good	Y	y
New Zealand	yes	Yes	Some info on land & megathrust	yes	yes	Good Active Source Obs	Y	?
Cascadia	Probably	yes	Paleoseismic	maybe	yes	Good	N	n

Also-rans

Tonga
Vanuatu
Solomon Islands
Nicoya
Southern Chile

Northern Japan

	strike slip behavior variability	of slip (ETS, etc.)	EQ history	accessibilit y	geological segments	ure/ Baseline Info	Seismicity	stages of "seismic" cycle
New Zealand	yes	Yes	Some info on land & megathrust	yes	yes	Good Active Source Obs	Y	?
Cascadia	Probably?	yes	Paleoseismi c	maybe	yes	Good	N	n
Alaska	yes	yes	Historic Some paleo	Yes	yes	Good	Y	y
Tonga		?	historic	Some "land"	Yes Holocene variability		Y	?
Vanuatu (central)	Y	?	Historic & some paleo	yes	Yes		Y	y
Northern Japan	yes	Contrast with Nankai	Historic & paleo	yes	Yes		Y	y
Solomon Islands	Y	?	Historic Paleo?	yes	yes		yes	y
Nicoya	y	y	historic	y	y	y	y	n
Southern	y	y	Historic &	y	y	Y (& EU)	y	y