

# Major Science Questions Seafloor / Geophysics

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# Axial Seamount

- What is the depth, geometry, & character of the magma supply & storage system?
- What controls changes in magma supply? Is there a long-term cycle of waxing & waning supply?
- How do deformation and seismicity relate to one another in space & time?
- Can eruptions be forecast? Can the forecasts be improved?
- What triggers eruptions?
- Do the caldera faults move during inflation & deflation?
- How do variations in inflation rate and seismicity relate to other measurable geophysical parameters (vent temperature, etc...)
- What drives long term fluid and thermal discharge at the hydrothermal vent fields?
- How do changes in Axial hydrothermal activity/seismic cycles (and tidal cycles) relate to biological activity at vents?
- What is the sensitivity of hydrothermal output to the magma supply?
- Are hydrothermal brines released during eruptions?
- What controls which rift zone the magma erupts out of? Can we forecast this?
- how will magma chemistry differ in the next eruption?

# Axial Seamount

## **Eruption Cycle**

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# Axial Seamount

## **Hydrothermal Systems and Responses**

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## **Magma Chemistry**

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# Axial Comparisons

- How does seismic activity at Axial Volcano relate to the seismic behavior of the rest of the ridges axis?
- How can we improve comparisons between Axial Seamount and the Endeavour
- How can we use observations at Axial to understand volcanoes and volcano hazards in general?

# Cascadia Subduction Zone

- Is the Cascadia subduction zone megathrust locked to the trench off central Oregon?
- Are there shallow slow slip events offshore central Oregon?
- Is there episodic tremor and associated low frequency and very low frequency earthquakes on the shallow megathrust?
- What is the distribution of seismicity associated with subducting seamounts offshore central Oregon?
- How can the OOI cabled array contribute to earthquake early warning?
- Is there interest in investigations of Gorda Ridge? southern Cascadia?

# Gas Hydrates

- What controls temporal variations in venting at Hydrate Ridge?
- What are the actual local cold seep fluxes (methane) and how much do they vary over time and what controls the long-term changes?