

Volcanism in Eastern Oregon

Deep Mantle Plume?

Upper Mantle Plume?

Back-arc Basin?

Something Else?

Three ways to melt the mantle

- Add water
- Add heat
- Reduce pressure



6 Ma Basalt flows Cove Palisades, Madras, Oregon



Cove Palisades Intra-Canyon Flow



Base of lower sequence, Cove Palisades



Smith Rocks State Park: ignimbrite flows & intrusive necks



John Day Formation in foreground, Rattlesnake Tuff on ridge



Picture Gorge Basalts, John Day River

Hart Mountain



West flank, Steens Mountain



Faulted east flank, Steens Mountain











RATTLESNAKES

RATTLESNAKES MAY BE FOUND IN THIS AREA.

**THEY ARE IMPORTANT MEMBERS OF THE
NATURAL COMMUNITY. THEY WILL NOT
ATTACK, BUT IF DISTURBED OR CORNERED,
THEY WILL DEFEND THEMSELVES.**

GIVE THEM DISTANCE AND RESPECT.



Steens Mountain summit outcrop



Steens Mountain summit outcrop



Wildhorse Canyon, Steens Mountain



Wildhorse Canyon, west flank, Steens Mountain



Oregon-Idaho Graben, near Juntura, OR



I-84 between Ontario and Baker City



Seven Devils Mountains above Hell's Canyon



CRB west side Hell's Canyon





CRB Dikes in Wallowa Granite

Wallula Gap, Columbia River





Geologists in field gear, CRB, Wallula Gap



Crown Point, Columbia River Gorge



Haystack Rock, Cannon Beach . . .