

Intertidal evidence for a Columbia River dam-break flood, 15th century CE?

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Abstract

The 15th century Bonneville Landslide dammed the Columbia River upstream of Portland, Oregon, at the site of the modern-day Bonneville Dam. The landslide dam may have failed in one or more catastrophic floods, and candidate flood deposits are exposed on estuarine islands downstream. An anomalous unit of gray silt and clay visible at low tide provides stratigraphic evidence for a flood perhaps triggered by rapid landslide dam incision. First described in the early 1990s, this probable flood deposit is being reexamined to refine estimates of its age, to check for signs of coeval seismic shaking, and to provide ground truth for flood simulations. The unit is distinctively paired with an overlying waterlaid tephra previously correlated geochemically with the 1479 Wn eruption of Mount St. Helens. Plant detritus within and beneath the unit provides material for radiocarbon dating. The unit's total thickness ranges from 1 to 8 cm. Its internal structure varies among sites, with some outcrops displaying two or three fining-upward layers while others contain just one. Sand dikes evidence ground shaking in some outcrops, though those observed thus far erupted at stratigraphic levels decimeters below and above the unit but not at the level of the probably flood deposit itself. Study of this downstream deposit joins other efforts to understand the timing, cause, and impact of the Bonneville Landslide.



Acknowledgments

These sediments were deposited under the watch of native people of the Columbia River, including those of Chinook Tribes Clatsop, Wahkiakum, Kathlamet, and Cowlitz.

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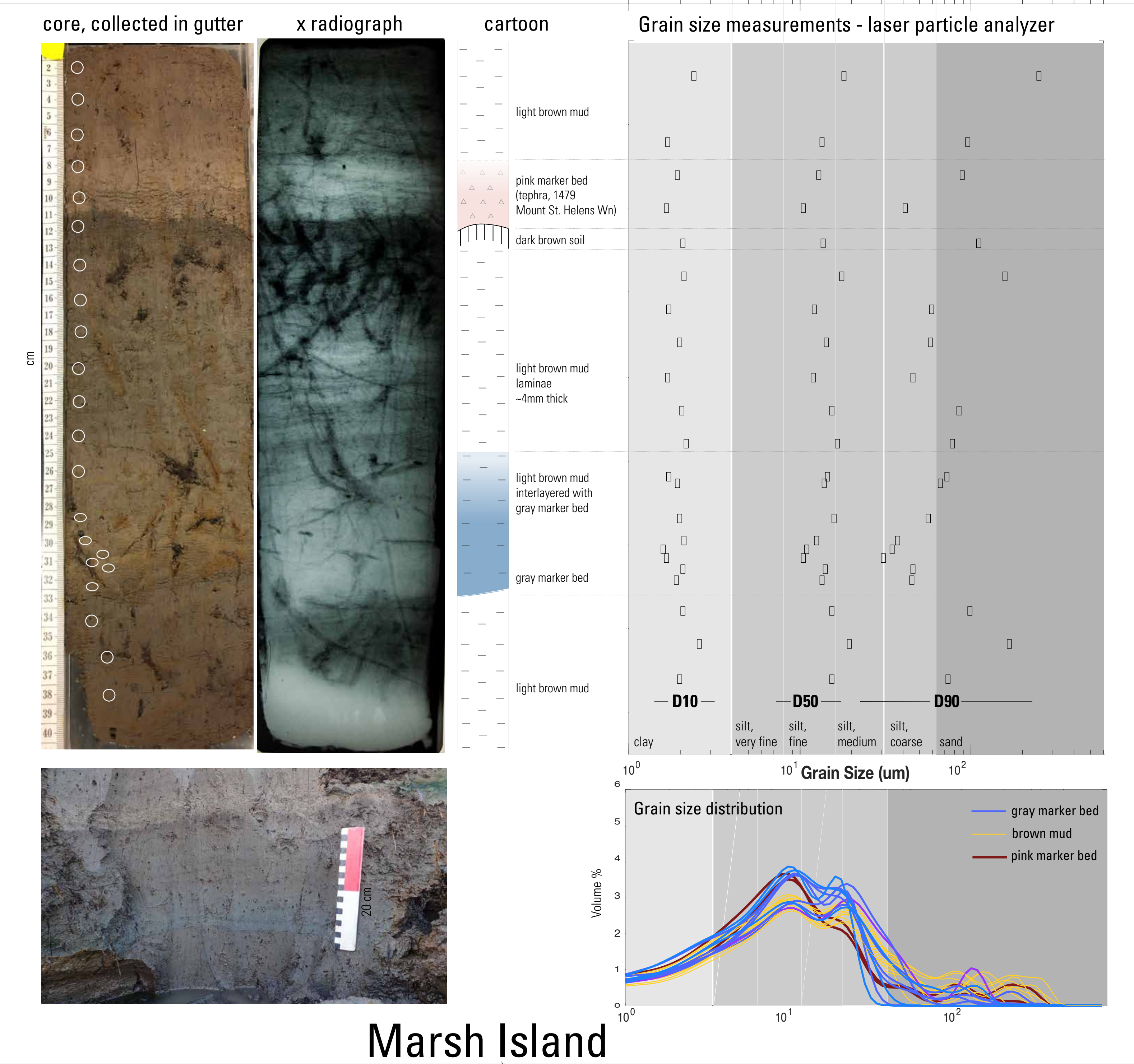
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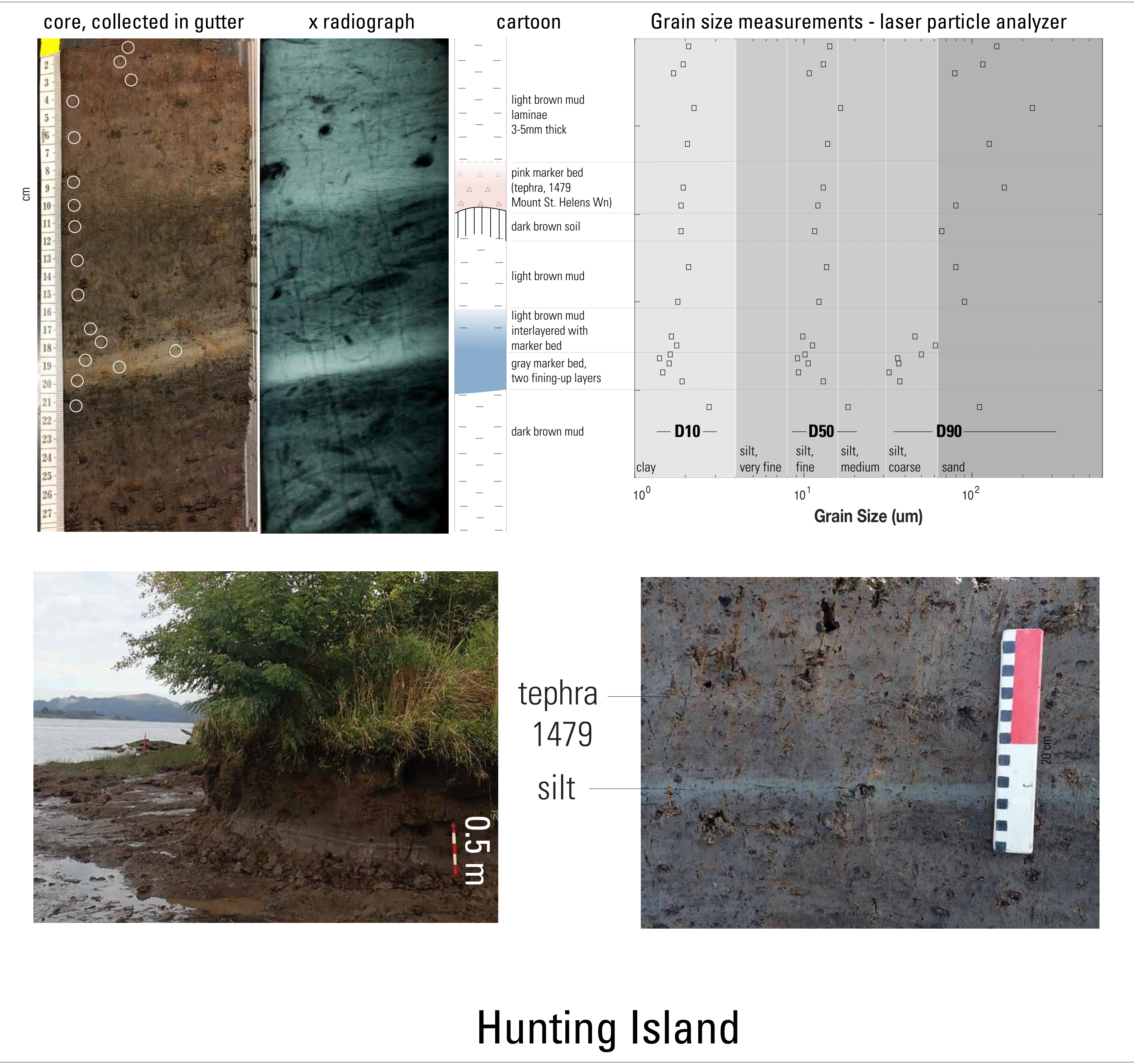
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Marsh Island



Hunting Island

