

Tipping Points in BC's Kelp Forest Ecosystems Triggered by Sea Otters



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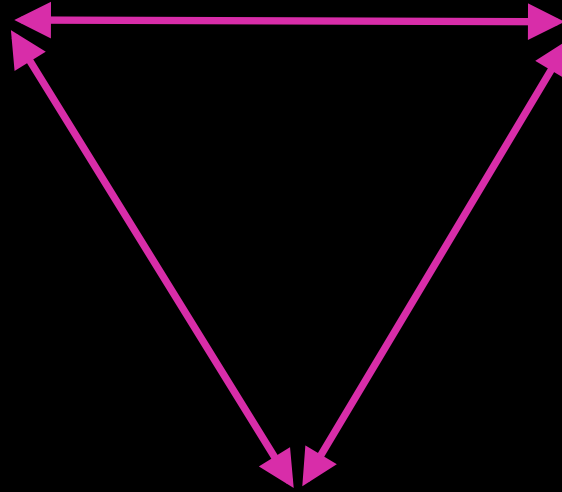
Photo: Lynn Lee

Coupled Social-Ecological Systems

Linked Systems of People & Nature



Social System



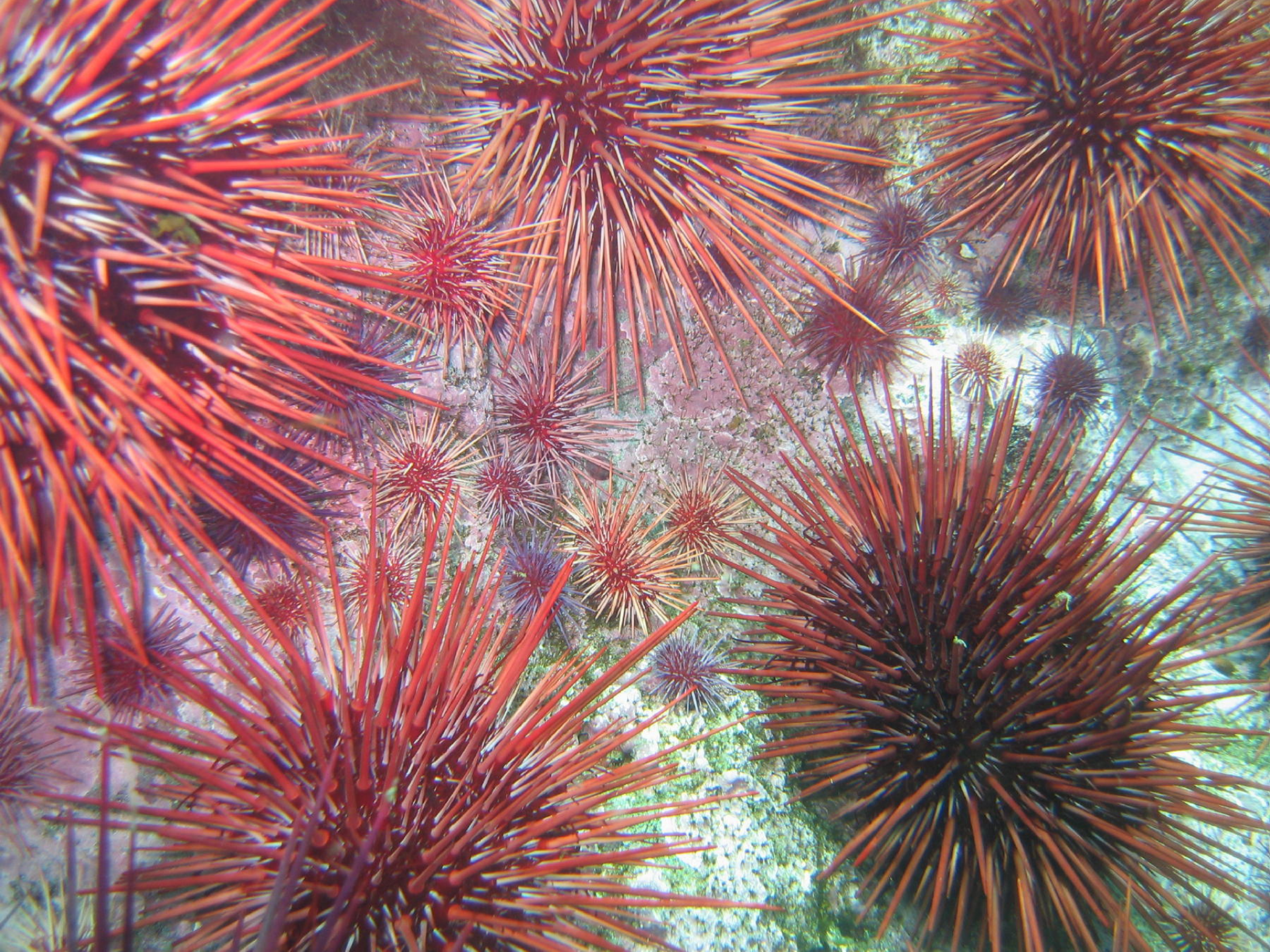
Management System



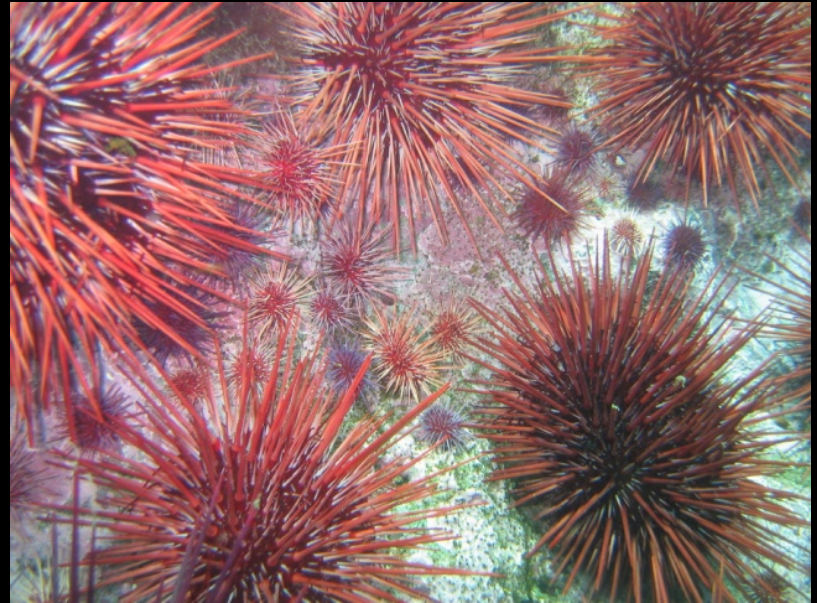
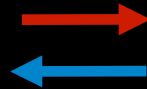
Ecosystem



Photo: Lynn Lee

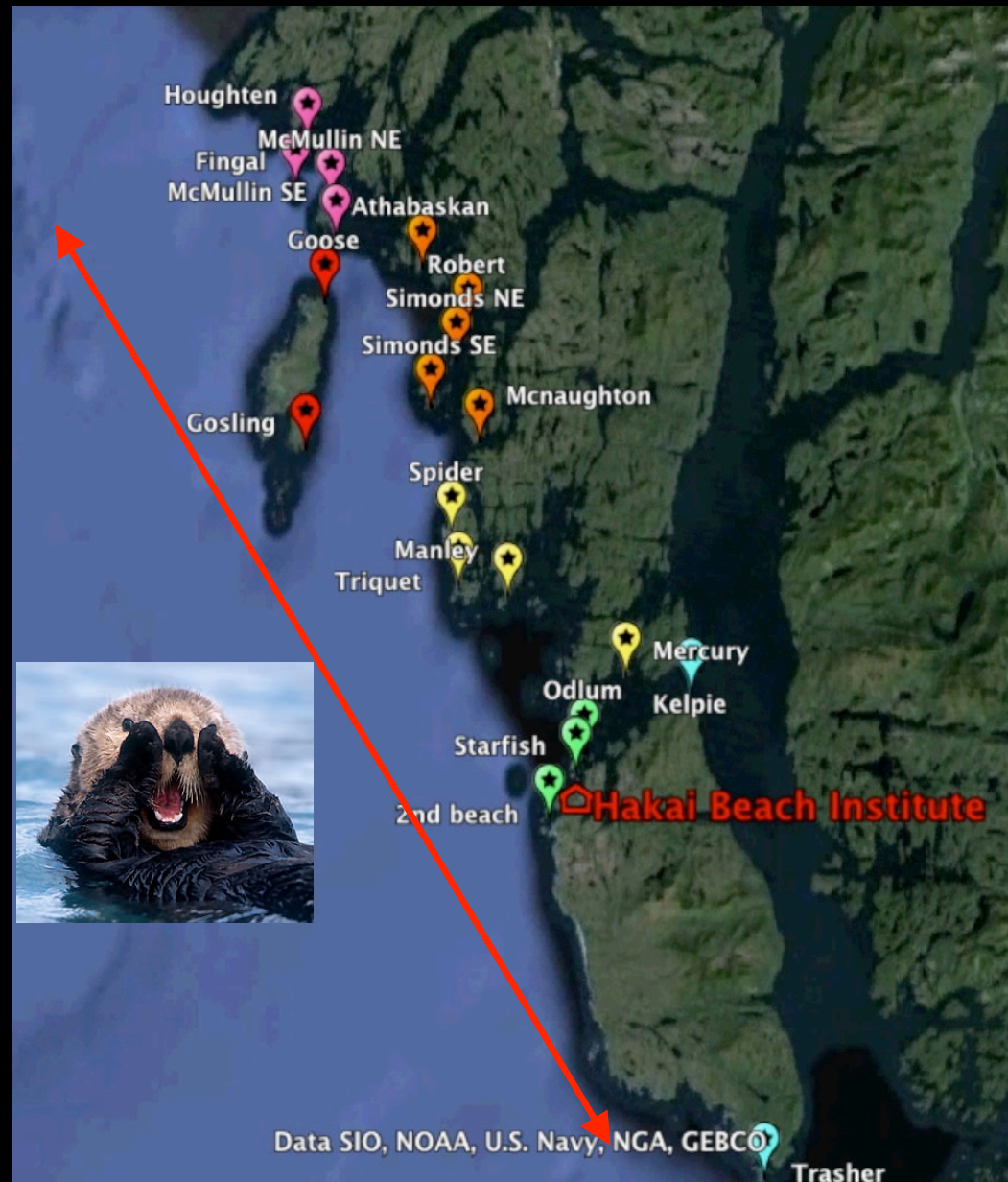


Ecological, Socio-Economic & Cultural Implications for People



When, where & to what extent will tipping points occur?

Gradient in Sea Otter Occupation Time

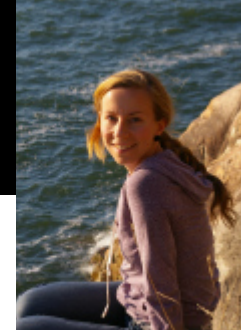






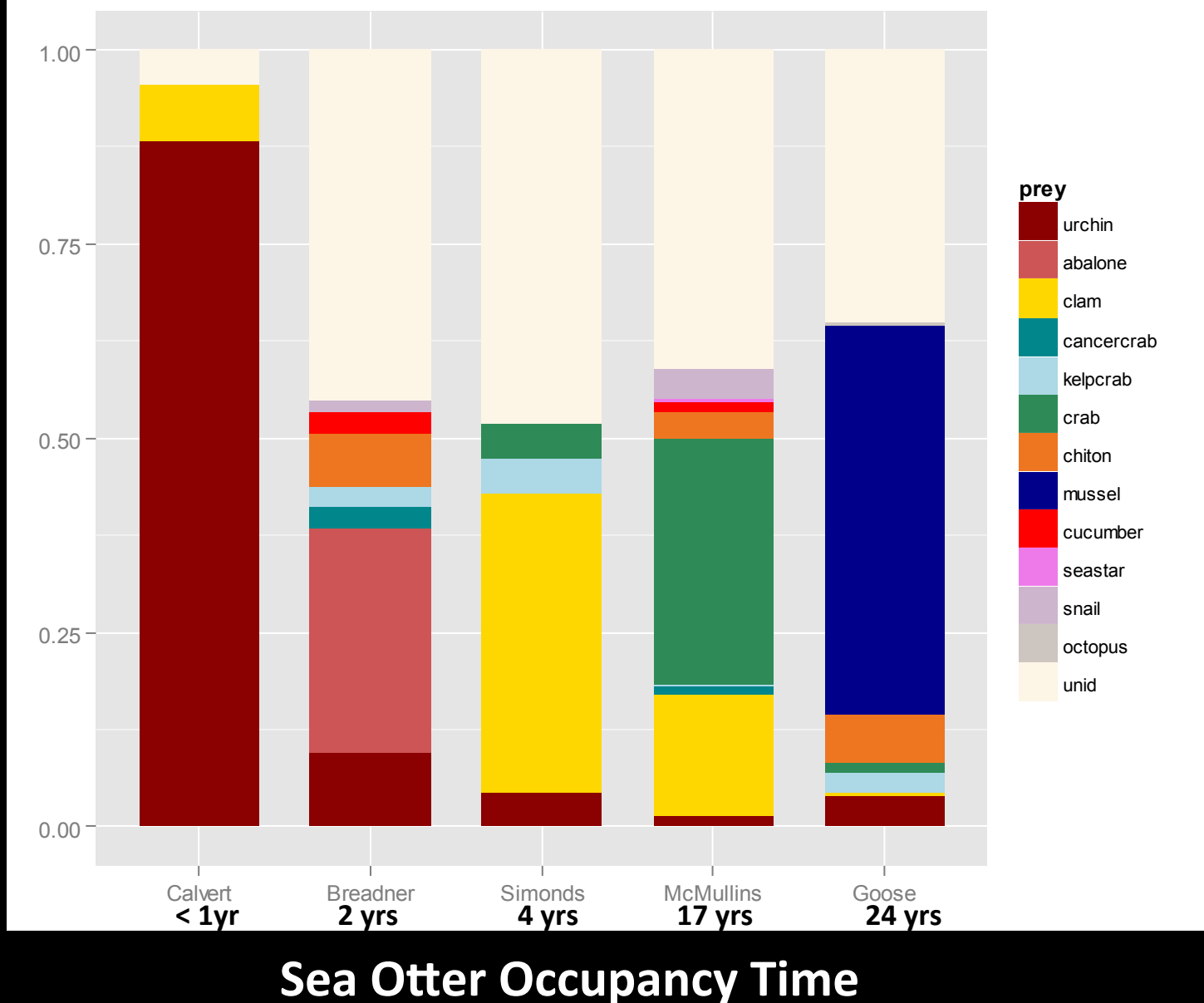
Linda Nichol

Sea Otter Diet Diversity

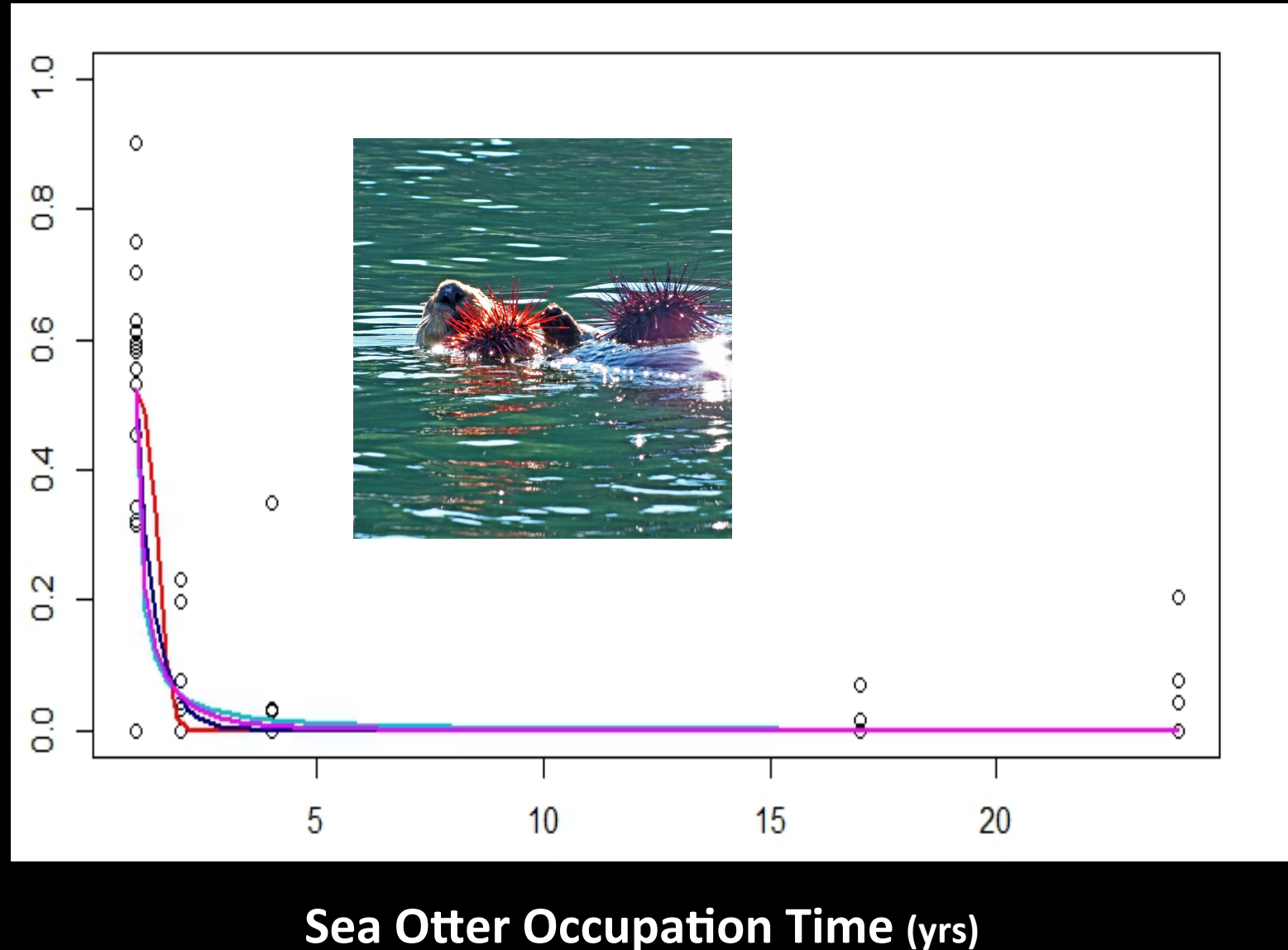


Leah Honka

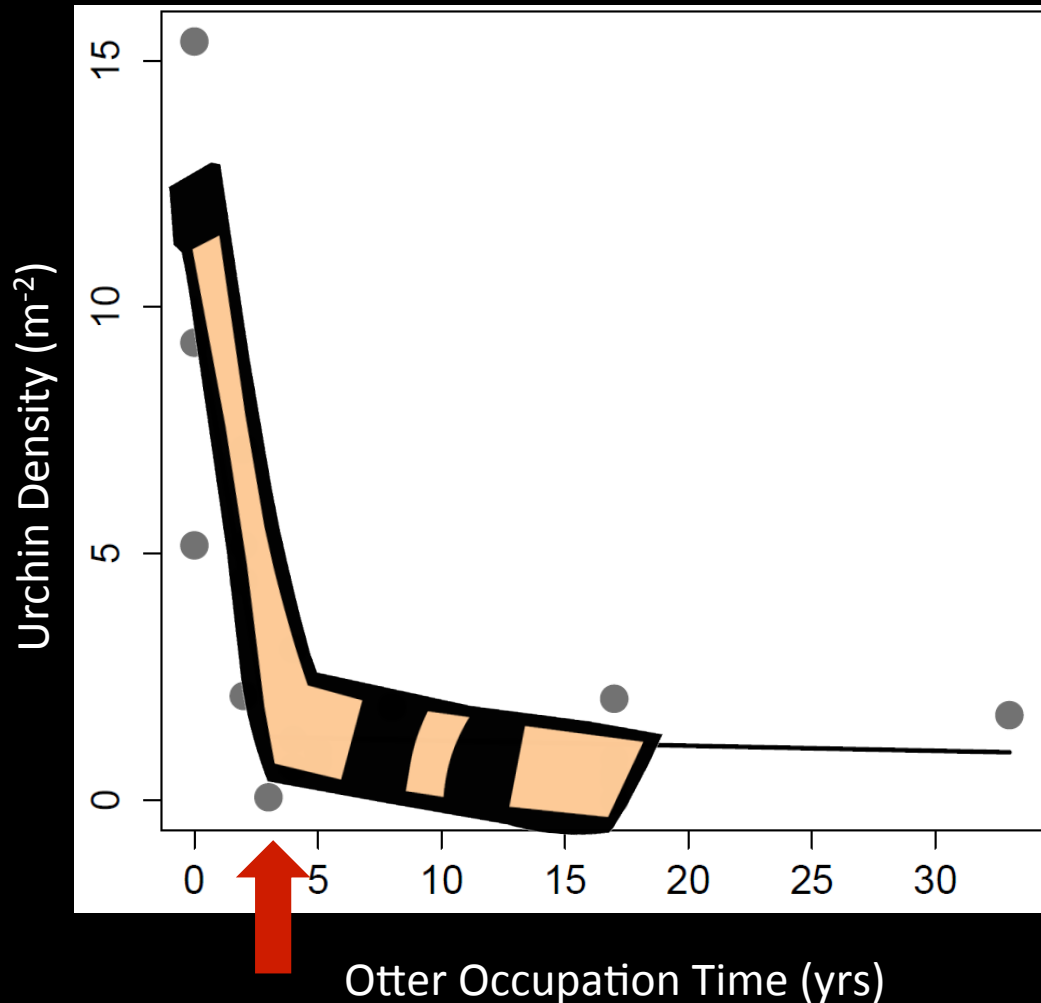
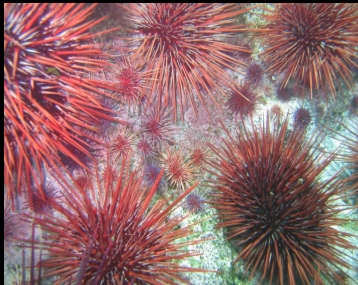
Fraction of Diet



Sea Otter Attack Rate



Strong Evidence for Tipping Points In BC Kelp Forests

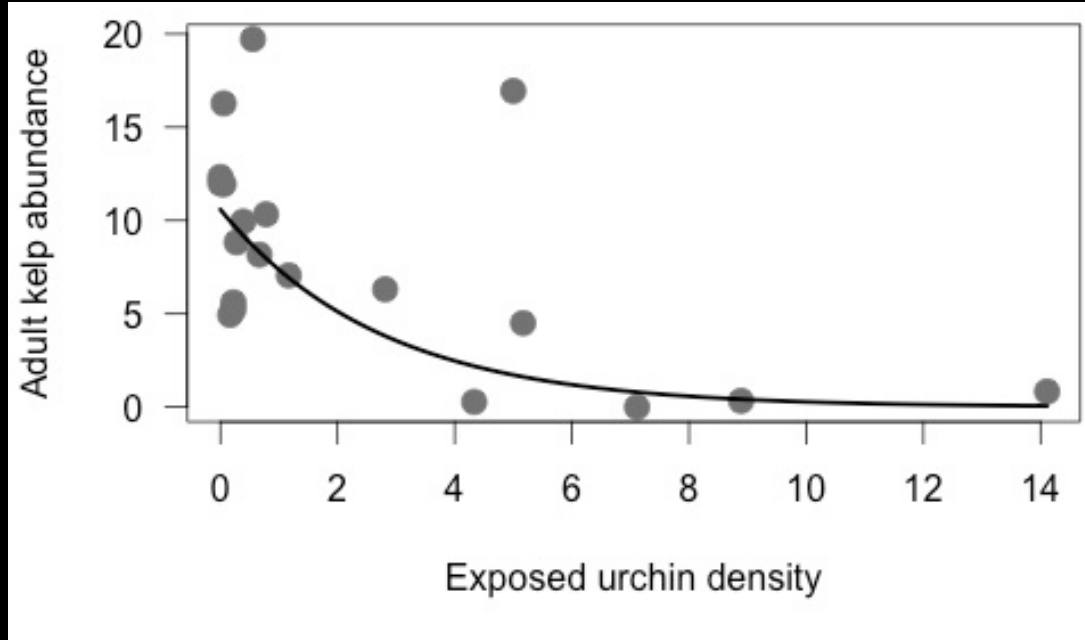


Kyle Demes

Strong Evidence for Tipping Points In BC Kelp Forests



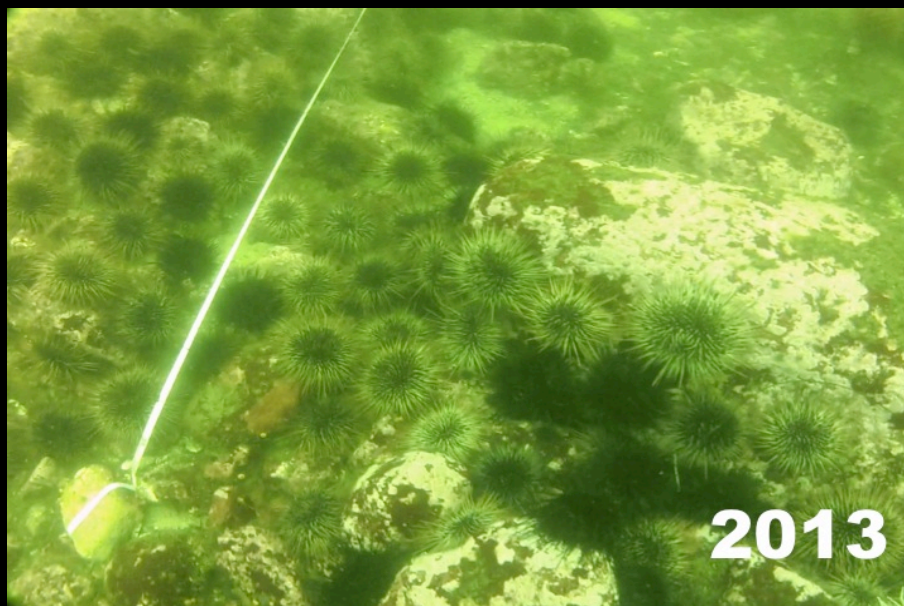
Kyle Demes





Jenn Burt

Second Beach, Calvert Island



2013



2014

Spatial Extent of Kelp Canopy Through Time



Keith Holmes

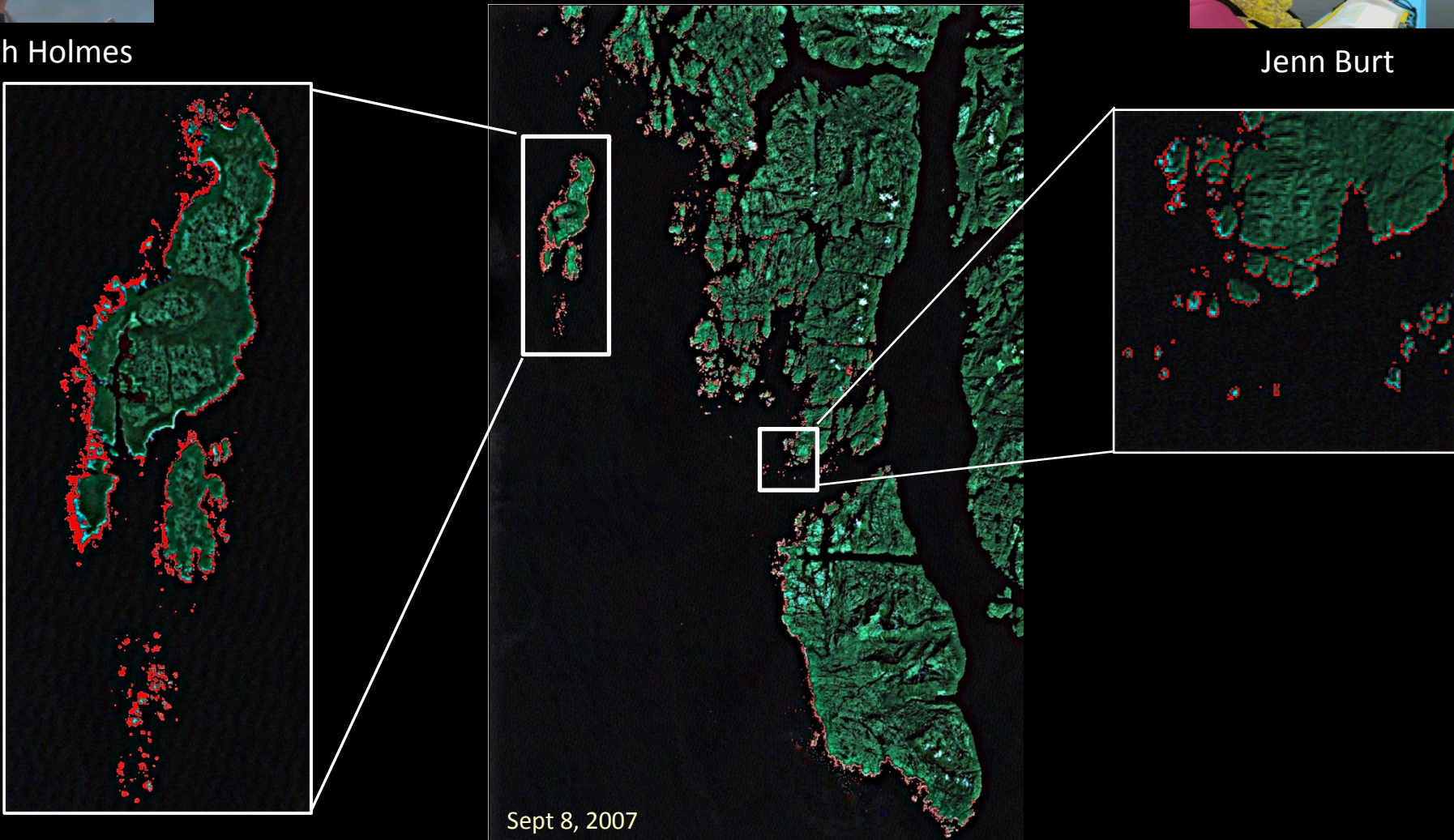
LANDSAT 1985-2007



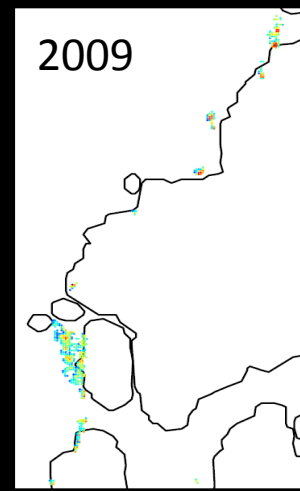
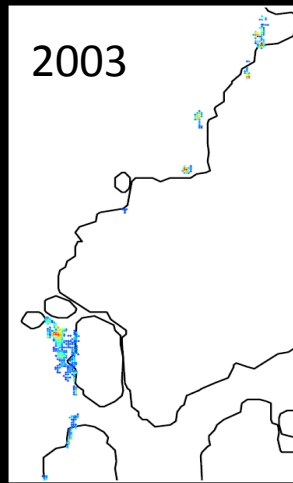
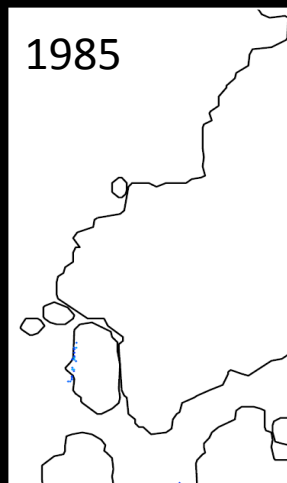
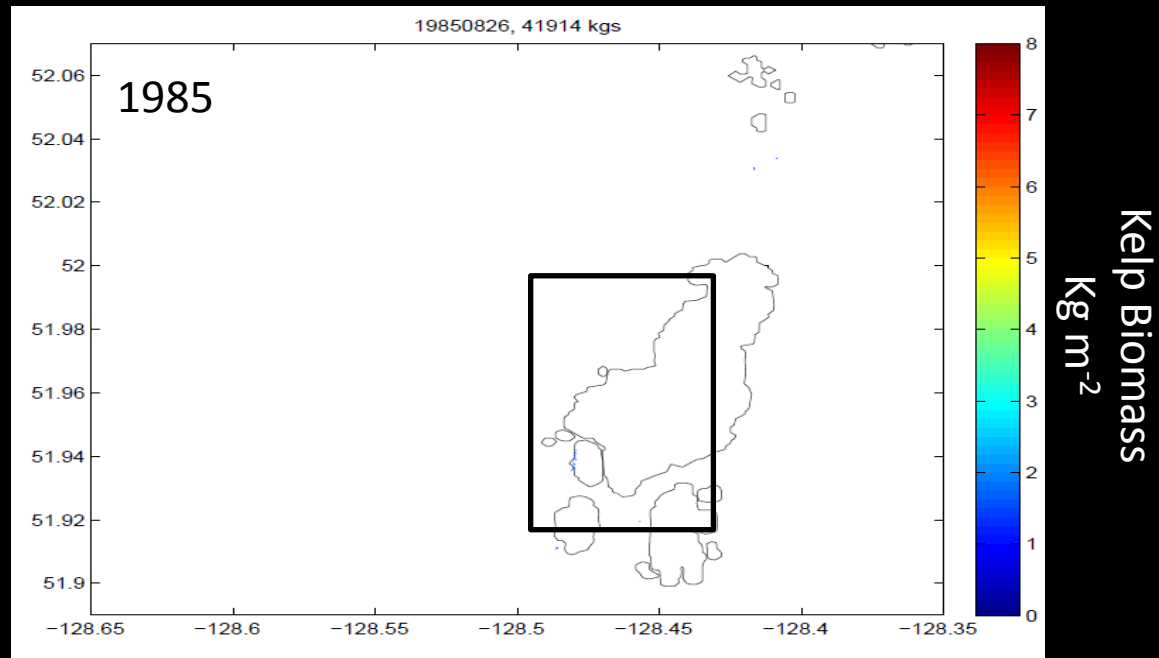
Kelp Extent



Jenn Burt



Expansion of Kelp Canopy Through Time



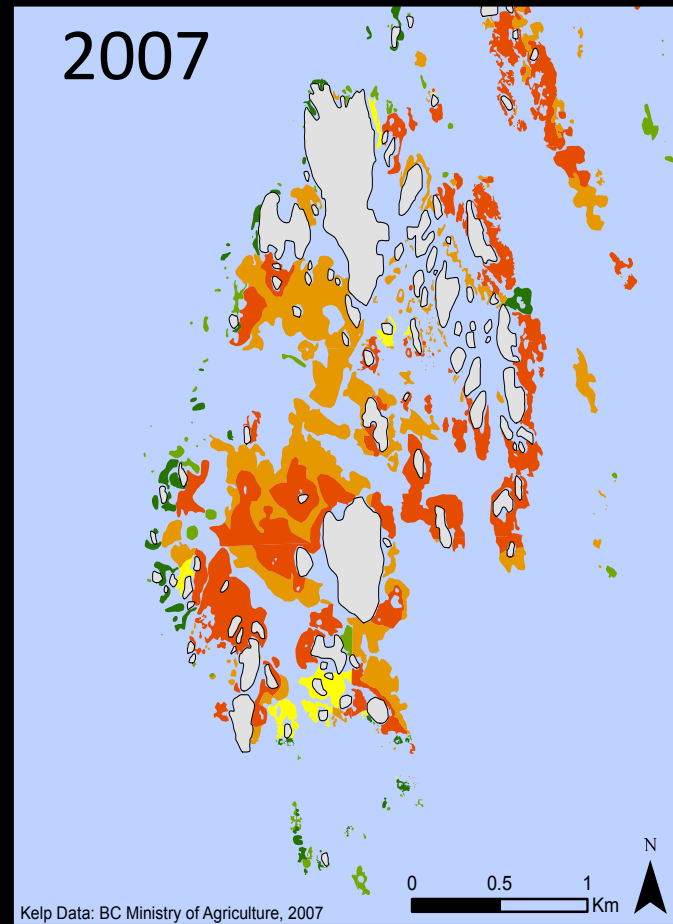
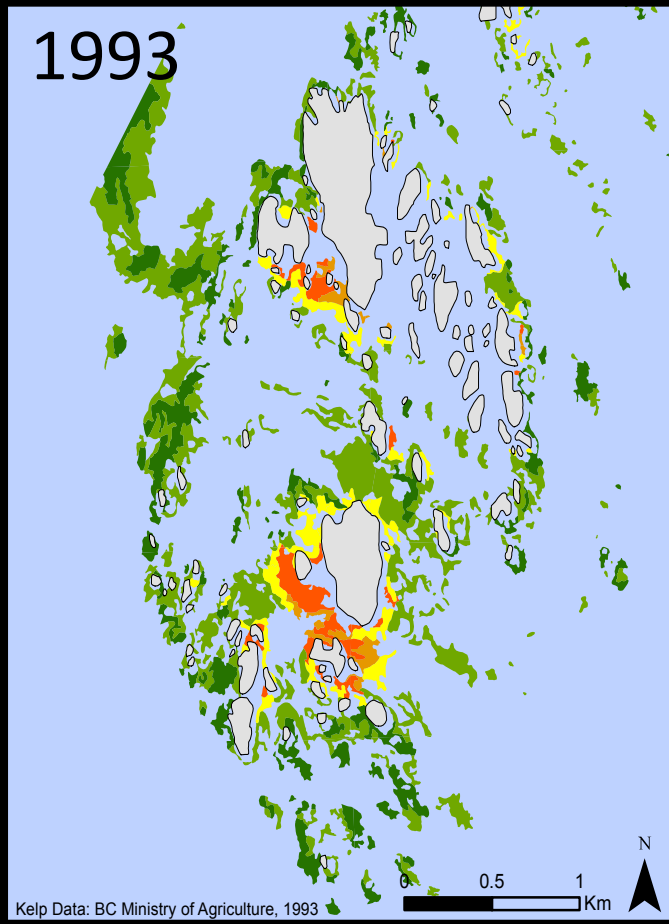
Change in Kelp Composition & Age

Aerial Mapping 1993 & 2007



Jenn Burt

- Giant Kelp (high)
- Giant Kelp (low)
- Bull kelp (high)
- Bull Kelp (low)
- Mixed beds



The Challenge

“We both have the right to food.” Barb Wilson, Haida Matriarch 2013



Canoe Pass, Barkely Sound BC, summer 2013



Gaaying'uhlas Roy Jones Sr. Haida Gwaii BC, summer 2013

Balancing the Needs of People & Nature



Thank you

Haaw'a

Ǵiáxsixa



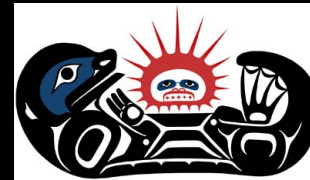
Haida Fisheries Committee
Haida Gwaii Watchmen



Heiltsuk Integrated Resource
Management Department



Laich-Kwil-Tach
Treaty Society



Gwaii Haanas
Parks Canada



Central Coast
Indigenous Resource Alliance

Thank You



Simon Fraser University
Coastal Marine Ecology & Conservation Lab