To the Ocean and Back

"When we try to pick out anything by itself, we find it hitched to everything else in the Universe."

–John Muir

Our class tracked Drippy from the snowy mountains, to the wet forests, through the streams into larger rivers, into estuaries and sheltered fjords, into the ocean. Drippy story doesn't end here, as evaporation can move Drippy back up into the atmosphere and so the cycle continues. Over both fast and long time scales, these cycles move materials across ecosystems and continents.

As "Drippy" progresses through the water cycle of coastal BC, our little water drop will encounter different:

- **Abiotic conditions**—the "habitat template" that sets the stage for populations, communities, ecosystems.

- **Communities**—the group of interacting species will be adapted to the abiotic conditions. These adaptations will reflect the selection of the different habitat, with different "solutions" the challenges of each location. Together, the communities and the habitat comprise the ecosystem.

- **Conservation challenges**—different areas are differently exposed and differently vulnerable to different anthropogenic pressures.

- **Management approaches and conservation solutions**—people are taking different approaches to try to address conservation challenges.

Habitat	**Component of abiotic habitat**	**Natural history**	**Challenge**	**Management**
Alpine	Snow, ice	Hibernation, caching food	Climate change	Maintain patches of habitat to increase resilience to climate change
Forest	Disturbance regime	e.g., fire adapted vs. fire tolerant	Timber harvest	Meta-pop'n theory to guide harvest rates
Stream	Energetic base of food web	River continuum concept	Dam	Dam removal
River	Hydrograph	Migration	Climate change	Single species models to set catch limits
Nearshore marine	Sediment type	Communities differ based on sediment type and base of food web	Aquaculture	Technology
Offshore marine	Light and nutrient limitation	Highly responsive communities	Harvest	Marine protected areas
Diaspora				Integrated coastal management

REM 475--Diaspora

Diaspora—the movement, migration, or scattering away from ancestral homeland.

These ecosystems are physically connected by the cycling of nutrients, contaminants, matter, migrations of animals, and movements of people.

- For example: Does forest harvest alter nearshore marine ecosystems?
- For example: How does salmon harvest in the ocean by fisheries alter coastal riparian ecosystems? (paper by Darimont)
- Sometimes these connections will be strong
- Sometimes these connections will be weak

Managing for multiple ecosystem uses

Managing for multiple cumulative threats

Great Bear Rainforest (named in 1997)

- **Stakeholders**: First Nations, conservation groups, BC government, hunters, loggers.
- *"We are going to work together to protect one of the last forests of its kind and improve the well-being of communities within it."*

- **Location**: temperate rain forest in Canada from Vancouver Island to SE Alaska
    - One of the largest intact areas of coastal temperate rainforest
    - 70,000 km^2

- Named after the Kermode ("spirit") bear—white variety of the black bear

- 2006—North and Central Coast Land Use Decision
    - Banned logging in 33% of area
    - Biodiversity, mining and tourism areas—prohibits commercial timber harvest and commercial hydro-electric power projects.
    - Ecosystem-based management operating areas

- Recognized direct and indirect ecosystem services and their associated trade-offs
    - Logging
    - Fisheries
    - Eco-tourism