

Facilitating ecological transformation on the Kenai Peninsula?

Doing nothing vs doing something

John Morton and Dawn Magness
Kenai National Wildlife Refuge



- Biomes - 2005**
- Aleutian Islands
 - Arctic
 - Boreal
 - Boreal Transition
 - North Pacific Maritime
 - Western Tundra

Arctic

Boreal

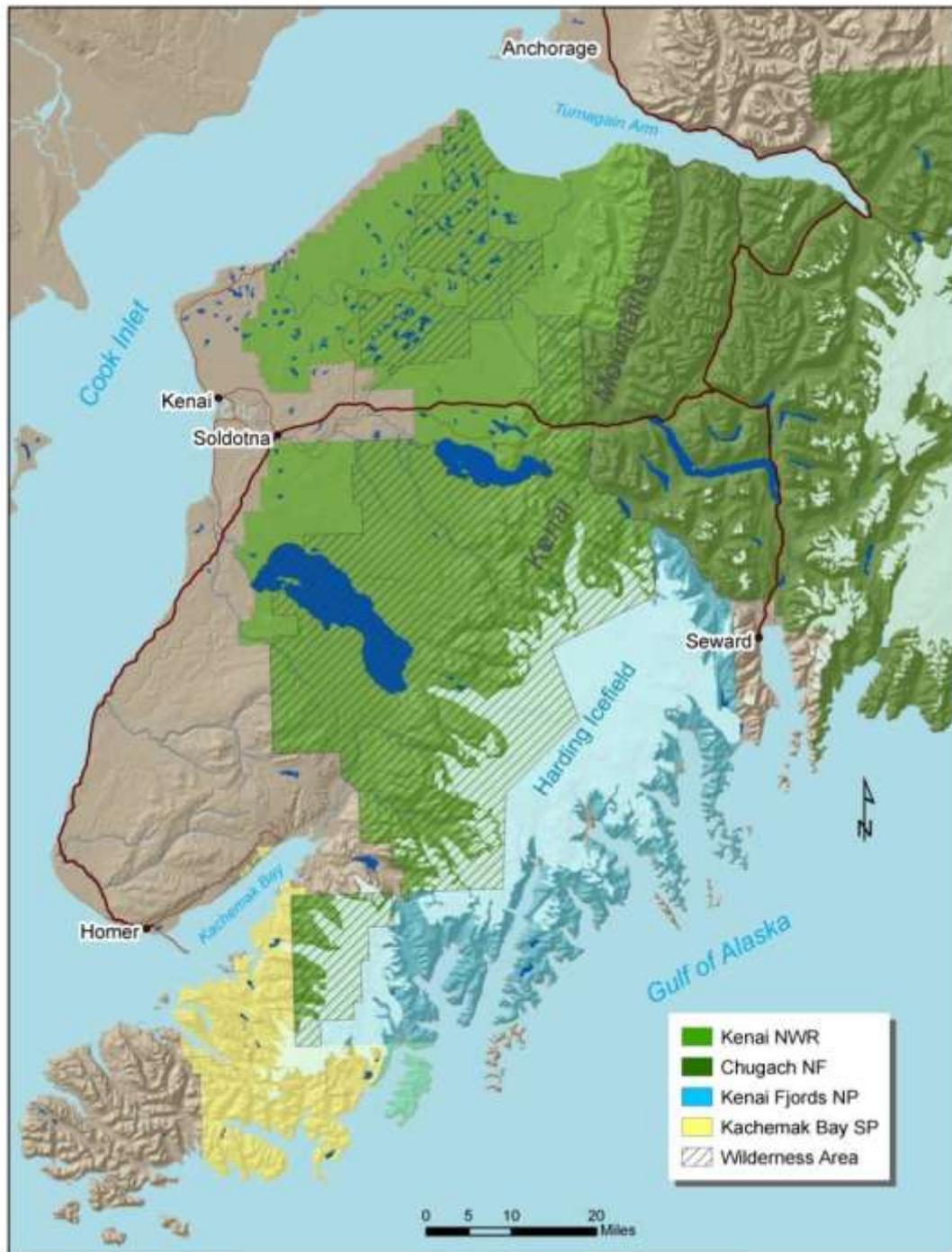
Boreal Transition

Western Tundra

North Pacific Maritime

Aleutians

0 125 250 500 Miles



- ✓ Alaska is warming at 2X Lower 48 rate
- ✓ Climate change effects are not masked by other anthropogenic drivers
- ✓ Kenai Peninsula may be best studied locale in AK outside of high arctic

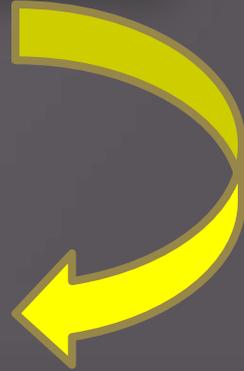




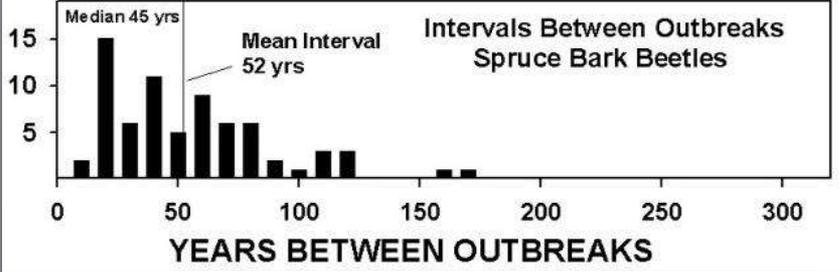
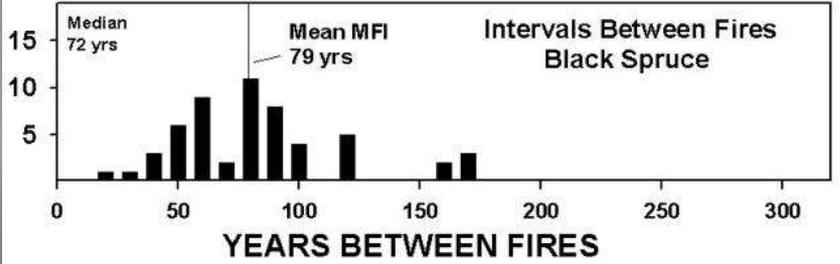
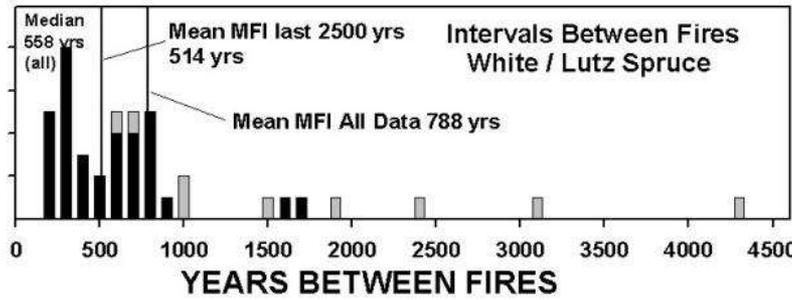


Kenai's landscape has changed dramatically in last 50 years in response to warming and drying

- available water (60% loss since 1968)
- wetlands (6 – 11% per decade)
- glaciers (11% surface area, 21 m elevation)
- + treeline (10 m per decade, $2.8 \text{ m}\cdot\text{y}^{-1}$)
- + SB beetle outbreaks (triggered by 2 consecutive warm summers)

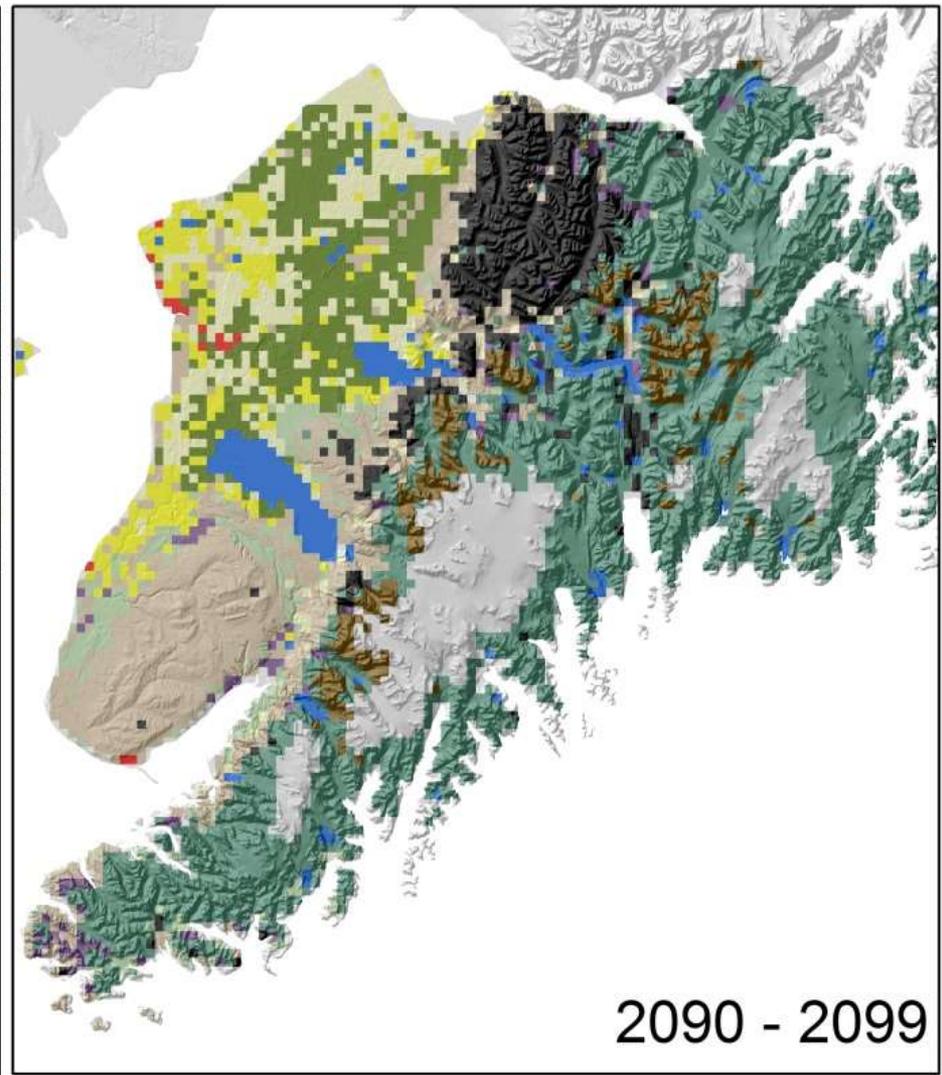
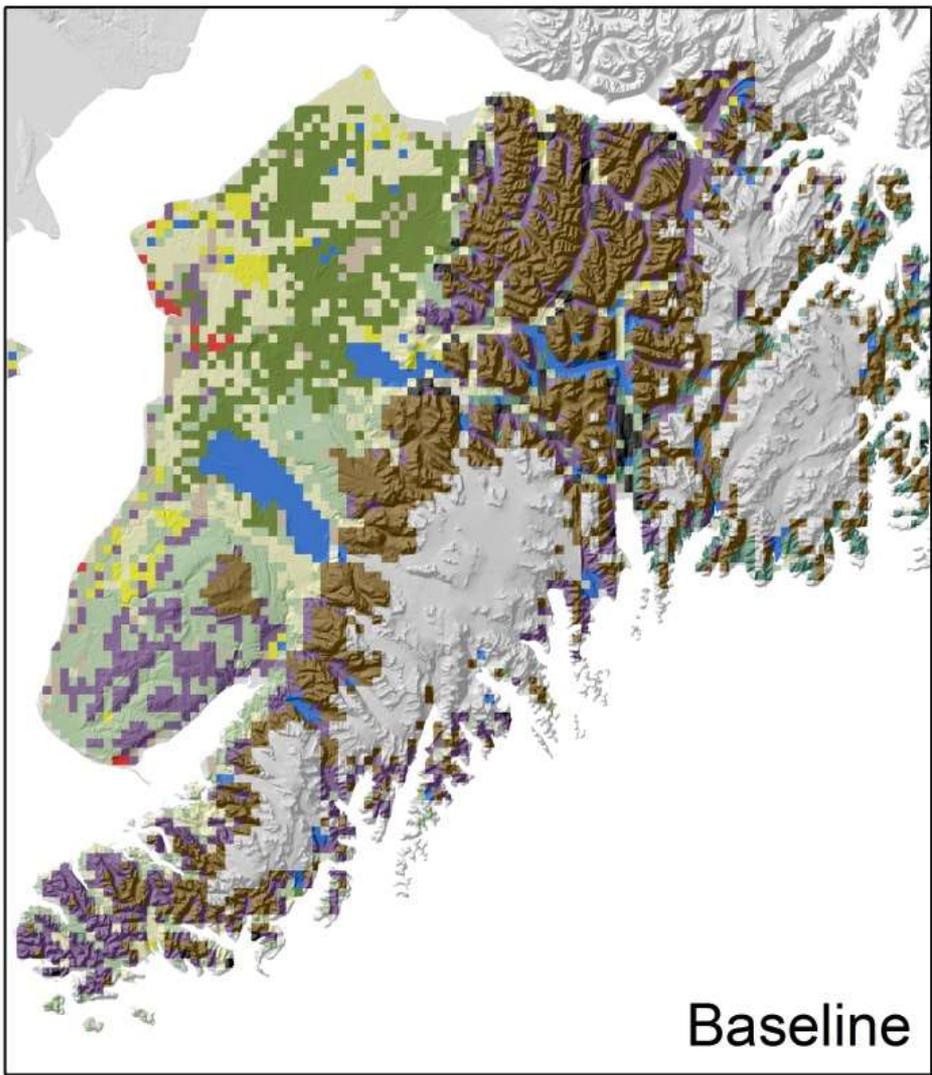


Official fire season is now April 1 instead of May 1



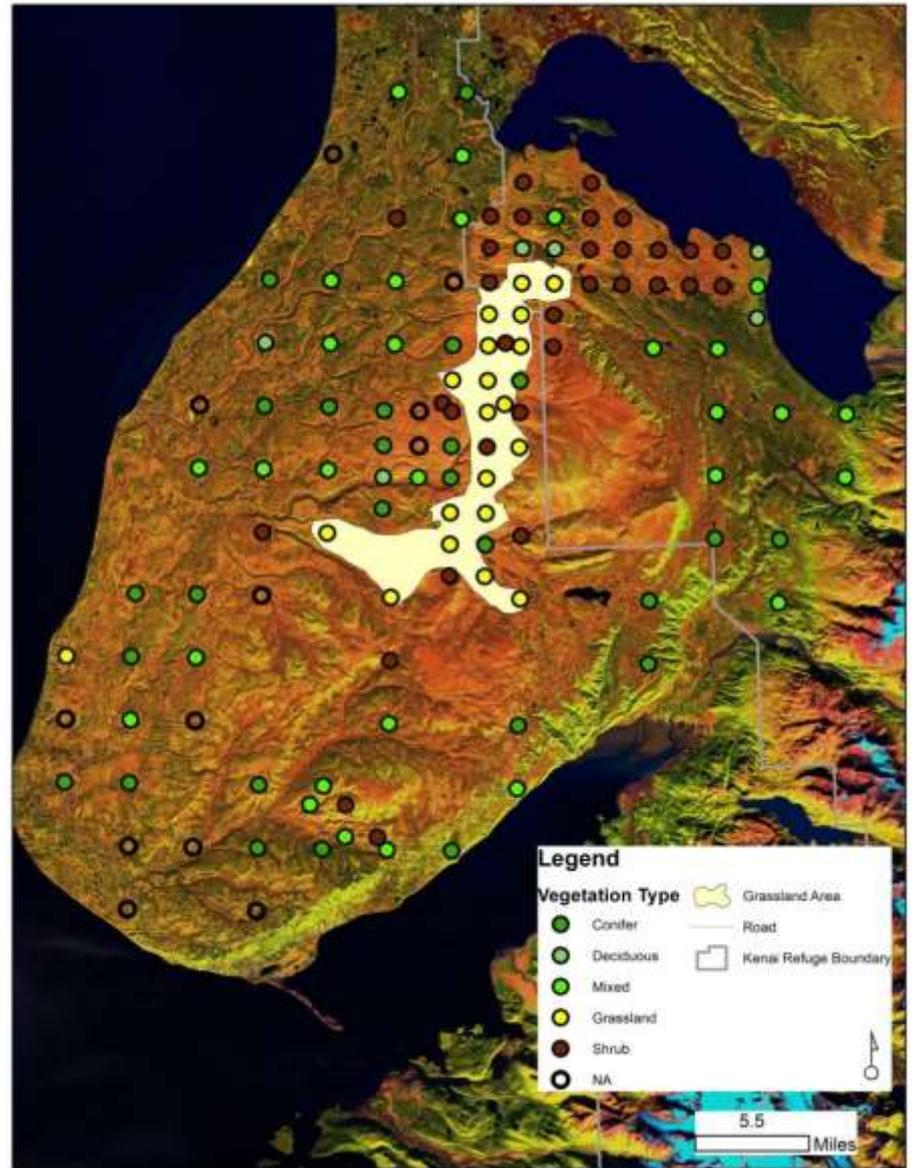
Woody shrub encroachment into 8000 year old Sphagnum peatlands







SEPT 1985

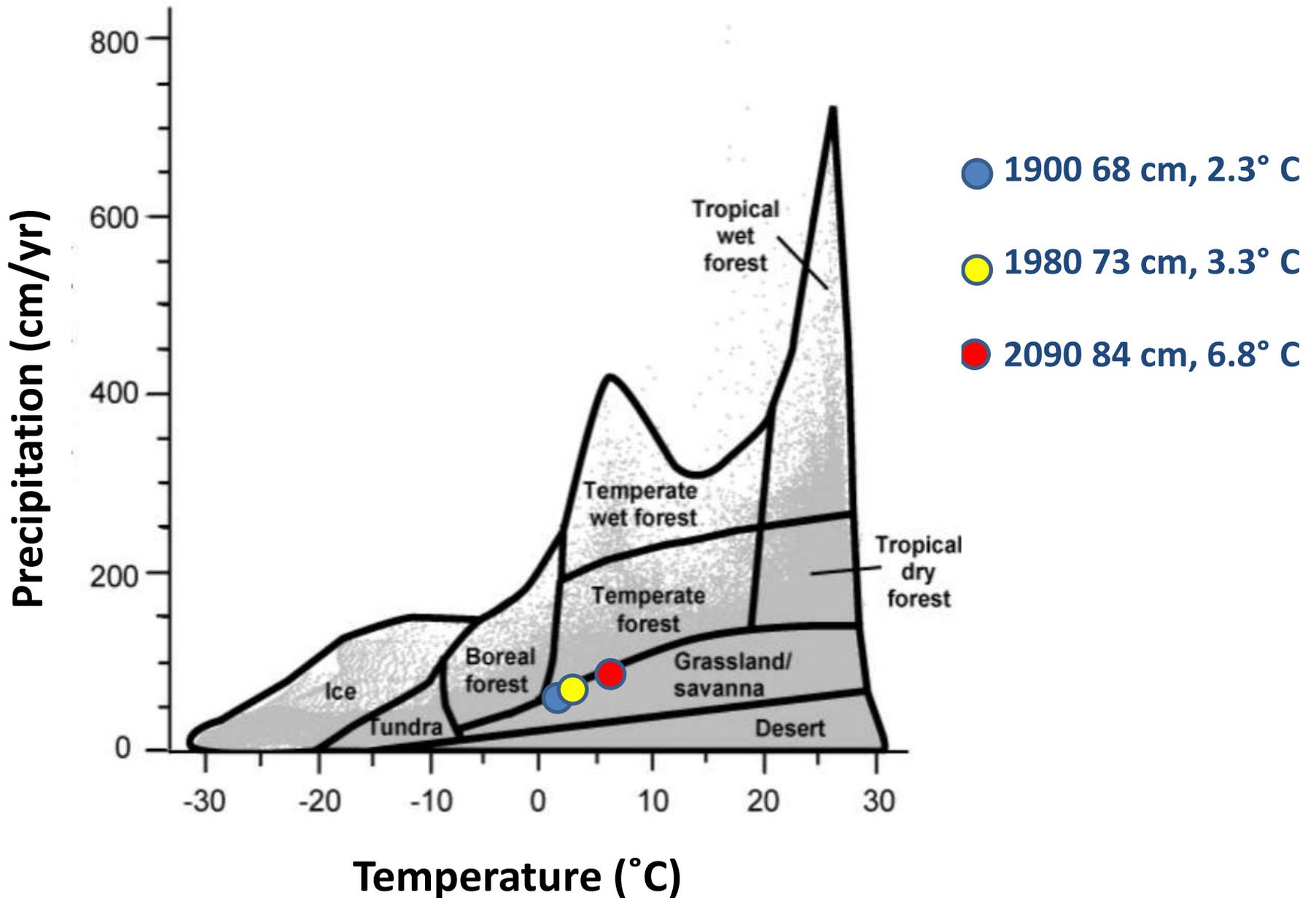


SEPT 2014





2015/07/19



Staudinger et al. 2012. Impacts of Climate Change on Biodiversity, Ecosystems, and Ecosystem Services: Technical Input to the 2013 National Climate Assessment.

A photograph of a beach at sunset. The sky is a mix of blue and orange. The ocean is calm. In the foreground, there is a dark, wet beach. In the middle ground, several polar bears are wading in the shallow water. There are also many seagulls scattered across the beach and in the water. One seagull is flying in the sky on the left side.

2 questions we need to ask ourselves....

What's the risk of doing nothing?

What's the risk of doing something wrong?

----Rosa Meehan

10 Feb 2010

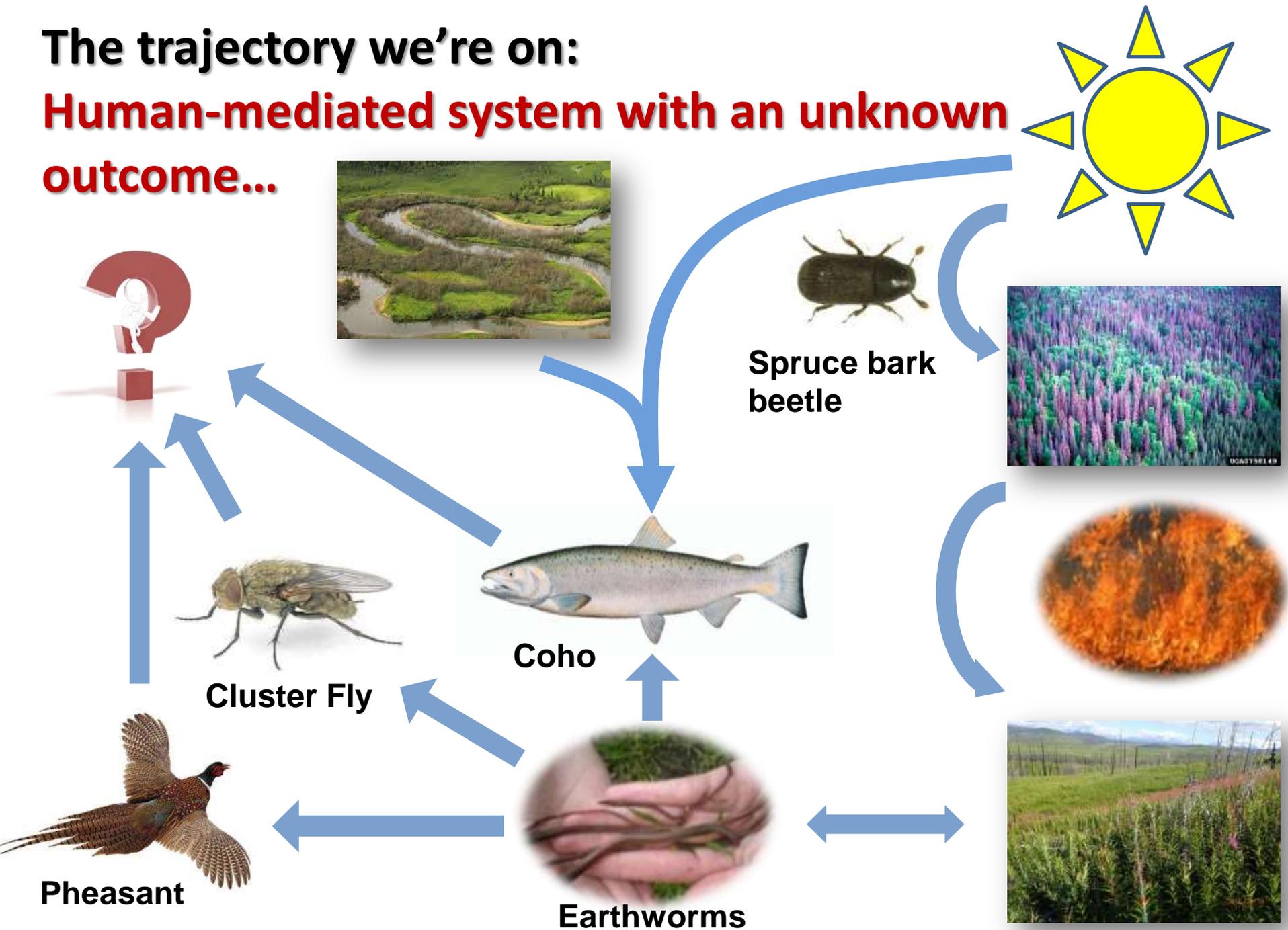


> 138 exotic species of flora (108) and fauna (30) occur on the Kenai Peninsula and are poised to fill novel assemblages



The trajectory we're on:

Human-mediated system with an unknown outcome...



Doing nothing is really doing something... just incoherently and haphazardly

- ✓ **Kenai Peninsula is already responding to a changing climate and forecasted to continue doing so**
- ✓ **Latitudinal migration is constrained by the Kenai Peninsula's isthmus and Kenai Mountains' rainshadow**
- ✓ **Novel assemblages ≠ simple re-shuffling of native biota — many exotic species already introduced and more enroute**
- ✓ **Should we influence (steward) these outcomes?**

DECREASING UNCERTAINTY BUT REDUCED OPPORTUNITY TO STEWARD THE OUTCOME

CURRENT TRAJECTORY

FOREST

LOGEPOLE PINE

BLACK-TAILED DEER



GRASS

PRESCRIBED FIRE

INTRODUCED GRAZERS



TIME

Constraints on moving forward...

- There is still some uncertainty about the ecological trajectory
- But...scientific uncertainty is NOT the deterrent to adaptation that many think
- Personal values of “-ologists” are constraining novel approaches
- Decisions are being made by agencies and private citizens...
 - sometimes without climate change as context,
 - but always without a comprehensive and coherent strategy
- We need more exploratory manipulative field studies
- We need to challenge existing policy constraints



Elements of resilience theory...

- ✓ We want systems to be self-organizing and self-sustaining
- ✓ Biodiversity is important as a way to hedge bets for future conditions
- ✓ Multiple possible ecosystem pathways and what's available to colonize matters
- ✓ Catastrophic, nonlinear change will coincide with incremental changes



Questions????