



# Climate Change Planning in Alaska's National Parks



## SOUTHWEST ALASKA INVENTORY AND MONITORING NETWORK (SWAN)

February 22-25, 2011

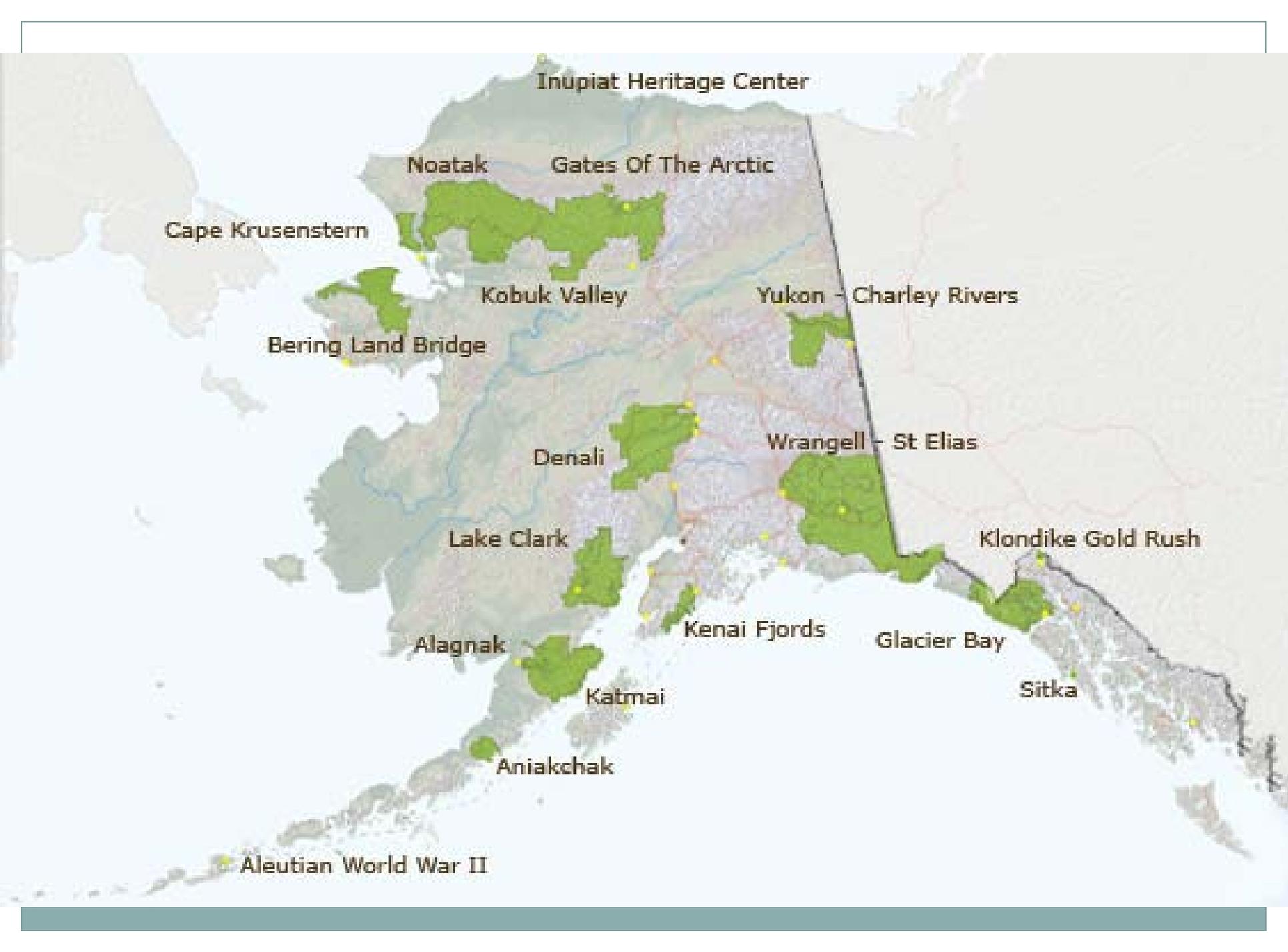
Anchorage, Alaska

# Pre-Workshop Summary

# Overall Project Summary



- **Changing climatic conditions are rapidly impacting environmental, social, and economic conditions in and around National Park System areas in Alaska.**
- **Alaska park managers need to better understand possible climate change trends in order to better manage Arctic, subarctic, and coastal ecosystems and human uses.**
- **NPS and the University of Alaska's Scenarios Network for Alaska Planning (UAF-SNAP) are collaborating on a three-year project that will help Alaska NPS managers, cooperating personnel, and key stakeholders to develop plausible climate change scenarios for all NPS areas in Alaska.**



Inupiat Heritage Center

Noatak

Gates Of The Arctic

Cape Krusenstern

Kobuk Valley

Yukon - Charley Rivers

Bering Land Bridge

Denali

Wrangell - St Elias

Lake Clark

Klondike Gold Rush

Alagnak

Kenai Fjords

Glacier Bay

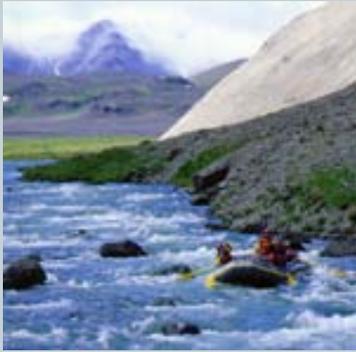
Katmai

Sitka

Aniakchak

Aleutian World War II

# Parks and Sites



**Aniakchak**



**Kenai Fjords**



**Lake Clark**



**Katmai**

*Aleutian WWII not included in assessment*

# Webinar#1



- **Introducing the basic concepts of scenarios planning, as outlined by GBN;**
- **Outlining the data and resources available through SNAP and other sources;**
- **Underscoring the general importance of planning for climate change;**
- **Reviewing the case studies from the August 2010 meeting, including all decision-making processes and generation of intermediate steps and results.**

# Webinar#2



- **Reminder of the role of climate drivers in the scenarios planning process**
- **Overview of climate drivers for the Southwest Alaska park network**
- **Discussion of a climate drivers table generated by John Walsh and Nancy Fresco**
- **“Homework” assignments**

# Webinar#3



- **Climate effects presentation by Bob Winfree**
- **Group discussion of climate effects table**
  - Individual input
  - Drivers grouped by category
  - Differences in opinion
  - Variations between parks

# Readings (pt. 1)



- *The Art of the Long View*, emphasis on first 4 pages (pp. 3-6); *User's Guide* (pp. 227-239); and *Appendix* (pp. 241-248). These can all be read for free on Amazon at <http://www.amazon.com/Art-Long-View-Planning-Uncertain/dp/0385267320> in the page previews (“Click to Look Inside”)
- SNAP one-page fact sheet (*Tools for Planners*) and link to website for optional browsing.
- Detailed notes from the August meeting.

## Readings (pt. 2)



- *Maritime and Transitional Talking Points*, entire document, online at <http://www.snap.uaf.edu/webshared/Nancy%20Fresco/NPS/Webinar%20%20SWAN/>
- *Beyond Naturalness* by David N. Cole and Laurie Yung entire book, but with a focus on pp. 31-33. This section is available for preview on Google Books. [http://books.google.com/books?id=gfErgkCy0HkC&printsec=frontcover&cd=1&source=gbs\\_ViewAPI#v=onepage&q&f=false](http://books.google.com/books?id=gfErgkCy0HkC&printsec=frontcover&cd=1&source=gbs_ViewAPI#v=onepage&q&f=false)
- *Southwest Alaska Climate Drivers table* online at <http://www.snap.uaf.edu/webshared/Nancy%20Fresco/NPS/Webinar%20%20SWAN/>

# NPS Talking Points Papers



- Available for *Alaska Maritime and Transitional* and *Alaska Boreal and Arctic*
- Provide park and refuge area managers and staff with accessible, up-to-date information about climate change impacts to the resources they protect
- Talking Points have three major sections:
  - a regional section that provides information on changes, organized around seven types of impacts
  - a section outlining No Regrets Actions that can be taken now to mitigate and adapt to climate changes
  - and a general section on Global Climate Change arranged around four topics

# Climate change scenarios training workshop

August 2010



- **Facilitated and led by Jonathan Star of Global Business Network (GBN)**
- **Participants included trainers, NPS staff from diverse regions and departments, SNAP researchers, and representatives of cooperating agencies.**
- **Participants learned how to develop scenarios based on nested framework of critical uncertainties**
- **Fleshed out the beginnings of climate change scenarios for two pilot park networks**

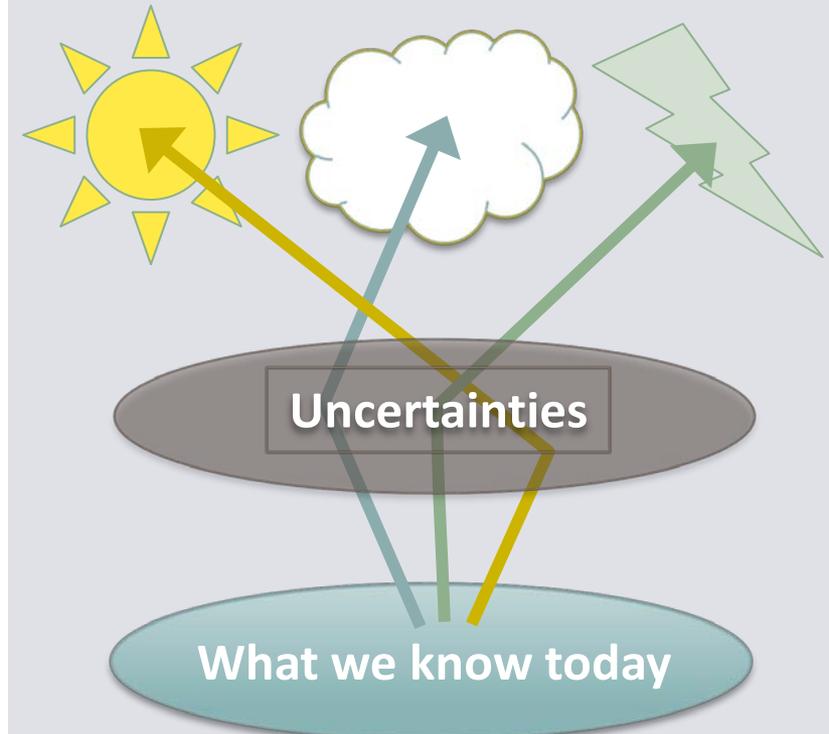
# Scenario Planning vs. Forecasting

- *Scenarios overcome the tendency to predict, allowing us to see multiple possibilities for the future*

- **Forecast Planning**
  - **One Future**

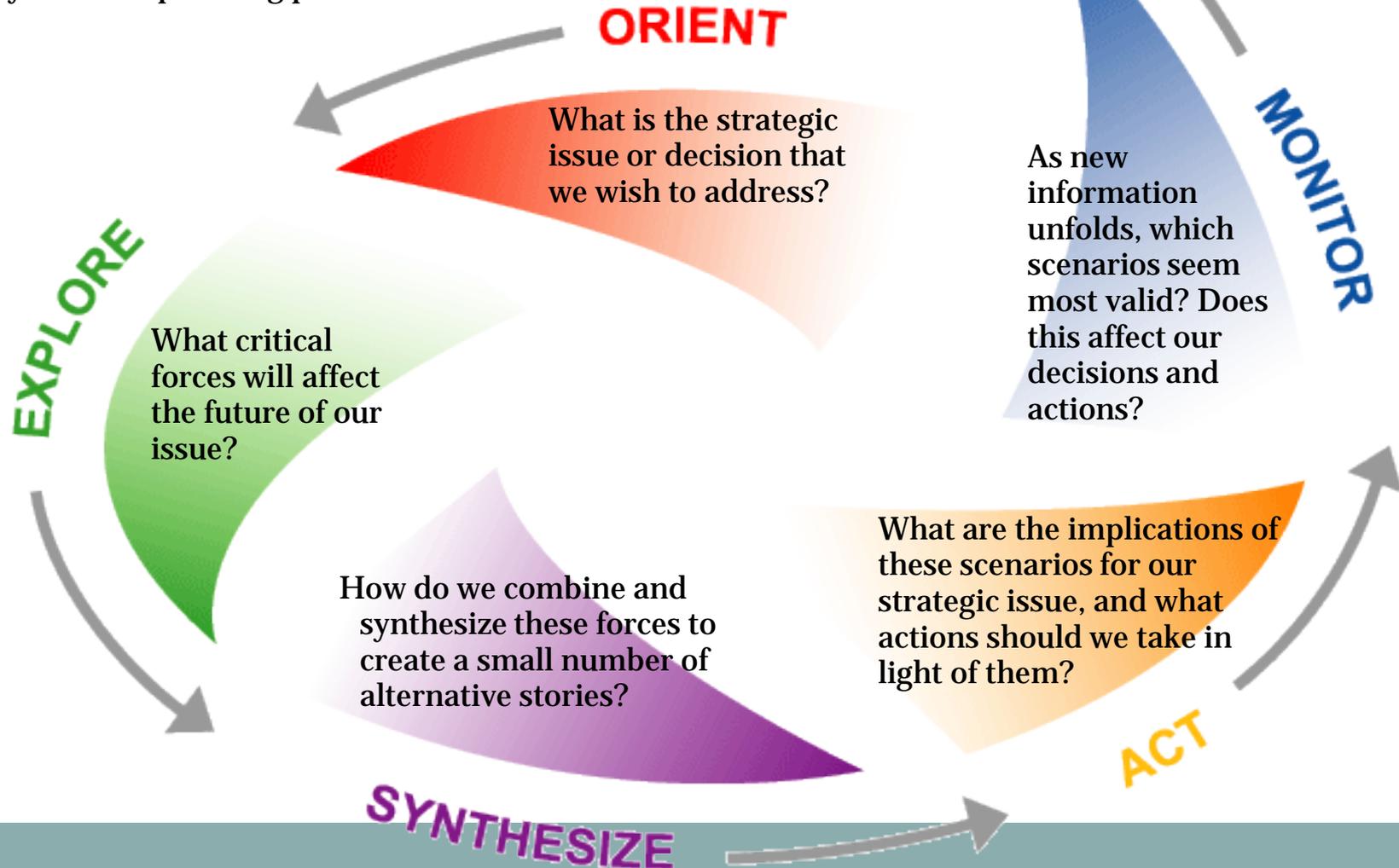


- **Scenario Planning**
  - **Multiple Futures**



# Explaining Scenarios: A Basic GBN Scenario Creation Process

This diagram describes the 5 key steps required in any scenario planning process



# Step one: Orient



What is the strategic issue or decision that we wish to address?

**How can NPS managers best preserve the natural and cultural resources and values within their jurisdiction in the face of climate change?**

*Cape Krusenstern National Monument*  
*All rights reserved by [BruceandLetty](#)*



To answer this challenge, we need to explore a broader question:



**How will climate change effects impact the landscapes within which management units are placed over the next 50 to 100 years?**

*Kenai Fjords National Park*  
*<http://www.ent.iastate.edu/sip/2005/companionontours>*

# Step Two: Explore



What **critical forces** will affect the future of our issue?

## CRITICAL UNCERTAINTIES

BIOREGION: \_\_\_\_\_

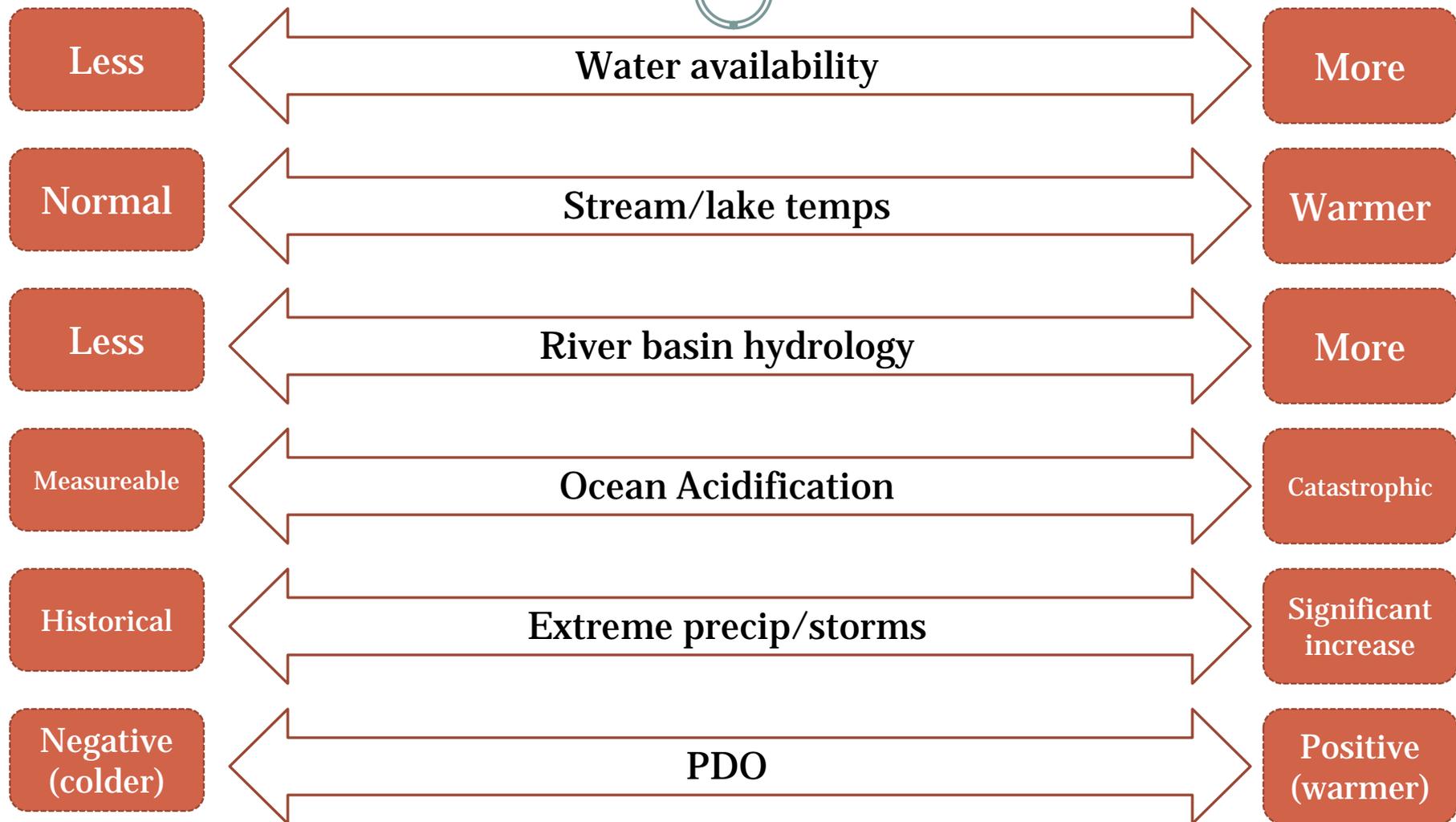
Over the next 50 – 100 years, what will happen to . . . ?

Three sets of horizontal arrows pointing left and right, intended for writing critical forces.

Critical forces generally have unusually **high impact** and unusually **high uncertainty**

# Critical Uncertainties

Southwest Alaska Network (SWAN) group



# CLIMATE SCENARIOS

BIOREGION: \_\_\_\_\_



# CLIMATE SCENARIOS

BIOREGION: SWAN



cold

*Naysayers'  
Delight*

- Reprive from climate change
- Masking damage
- Buying time
- Shrimp and crab delight

- ↑ crab stocks, shrimp
- Sea surface down (??)
- Salmon stocks ↓, salmon prices ↑, subsistence (salmon) more difficult
- ↑ snowpack
- Marine collapse
- Problems don't look like climate change

*Happy  
Moose and  
Skiers*



measurable

Ocean

Acidification

catastrophic

PDO (Pacific Decadal Oscillation)

Spruce bark beetle ↑  
Other pests ↑  
Fire potential

Plankton  
Benthic calcifiers ↓  
Collapse of base of food chain  
Sea bird populations ↓  
Marine mammals ↓

*Happy Salmon,  
Happy Wolves,  
Unhappy Skiers*

*Worst of the  
Worst*

warm

# CLIMATE SCENARIOS

BIOREGION: SWAN



**Significant increase**

- Decrease in aquatic (including salmon) productivity
- Major conflicts between sport, commercial, and subsistence fishing, land management, and tourism
- Bird populations have declined.
- Shifts in vegetation distribution
- Increased erosion
- Nonnative species invasion.

*Fish Wars*

*Washout*

- Glacial outburst
- New stream habitat becomes available
- Safety and road wash out, transportation issues

Extreme precipitation events/storms

**historical**

**Acidification**

- Collapse of calcifying fauna salmon and other fish populations down
- Fishing and tourism industries injured
- Surrounding marine and terrestrial mammals stressed
- Decrease in sound absorption affecting marine mammals
- Dramatic ecosystem shifts in marine near-shore habitats

*Acid Reflux/Empty Cupboards*

**Ocean**

- Few major changes along coasts Increases in wildfires and pests Vegetation biomes shift
- More invasive species
- Stream volumes decreasing
- Drying wetlands
- Fish reproduction down
- Marine and terrestrial mammal populations down

*Steady Eddy*

**measurable**

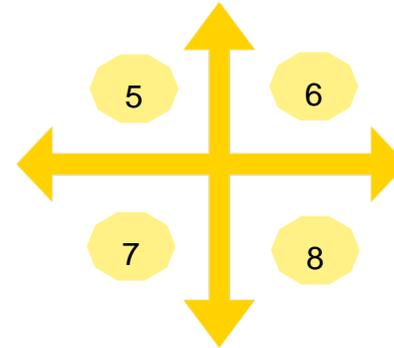
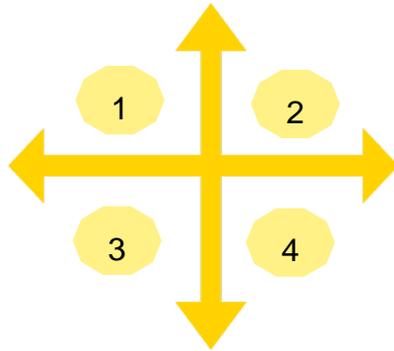
**catastrophic**

# “Nested Scenarios”?

*Riots and Revolution...*

Broad Understanding  
Heightened Urgency

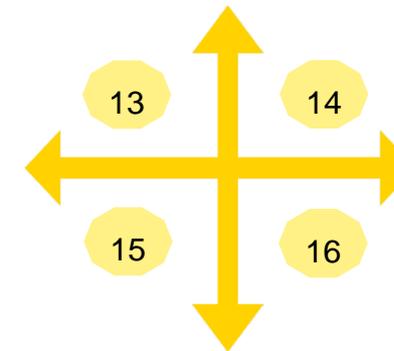
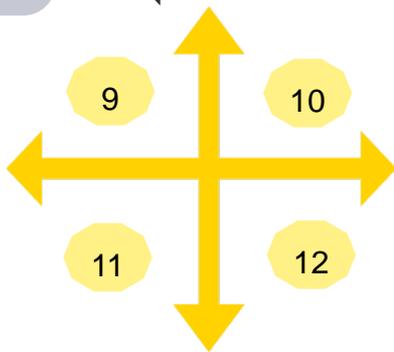
*Big problems, Big solutions...*



Lack of senior commitment  
Varied approaches and alignment  
Short-term concerns

Nature of Leadership

Senior commitment  
International alignment  
Long-term perspectives



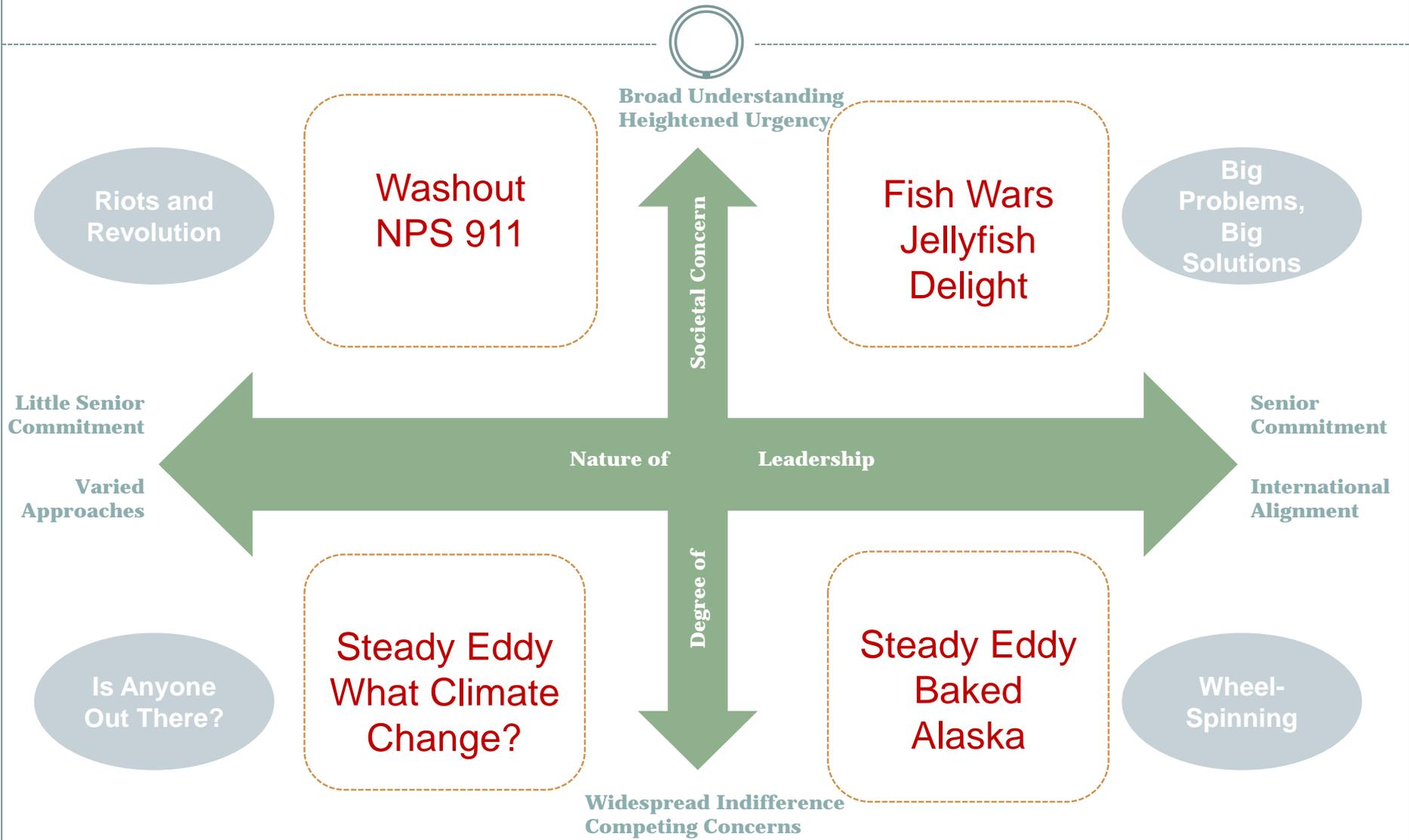
*Is Anyone Out There?...*

Widespread indifference  
Competing concerns

*Wheel-Spinning...*

# NESTED SCENARIO MAP

BIOREGION: SWAN



# NESTED SCENARIO DETAILS

BIOREGION: \_\_\_\_\_



Socio-  
Political

Bioregion  
Climate

**Describe This World in 2030**

**Major Impacts on the Bioregion**

**Issues Facing Management**

# NESTED SCENARIO DETAILS

BIOREGION: SWAN



**Socio-  
Political**

**Big Problems, Big Solutions**

**Fish Wars**

**Bioregion  
Climate**

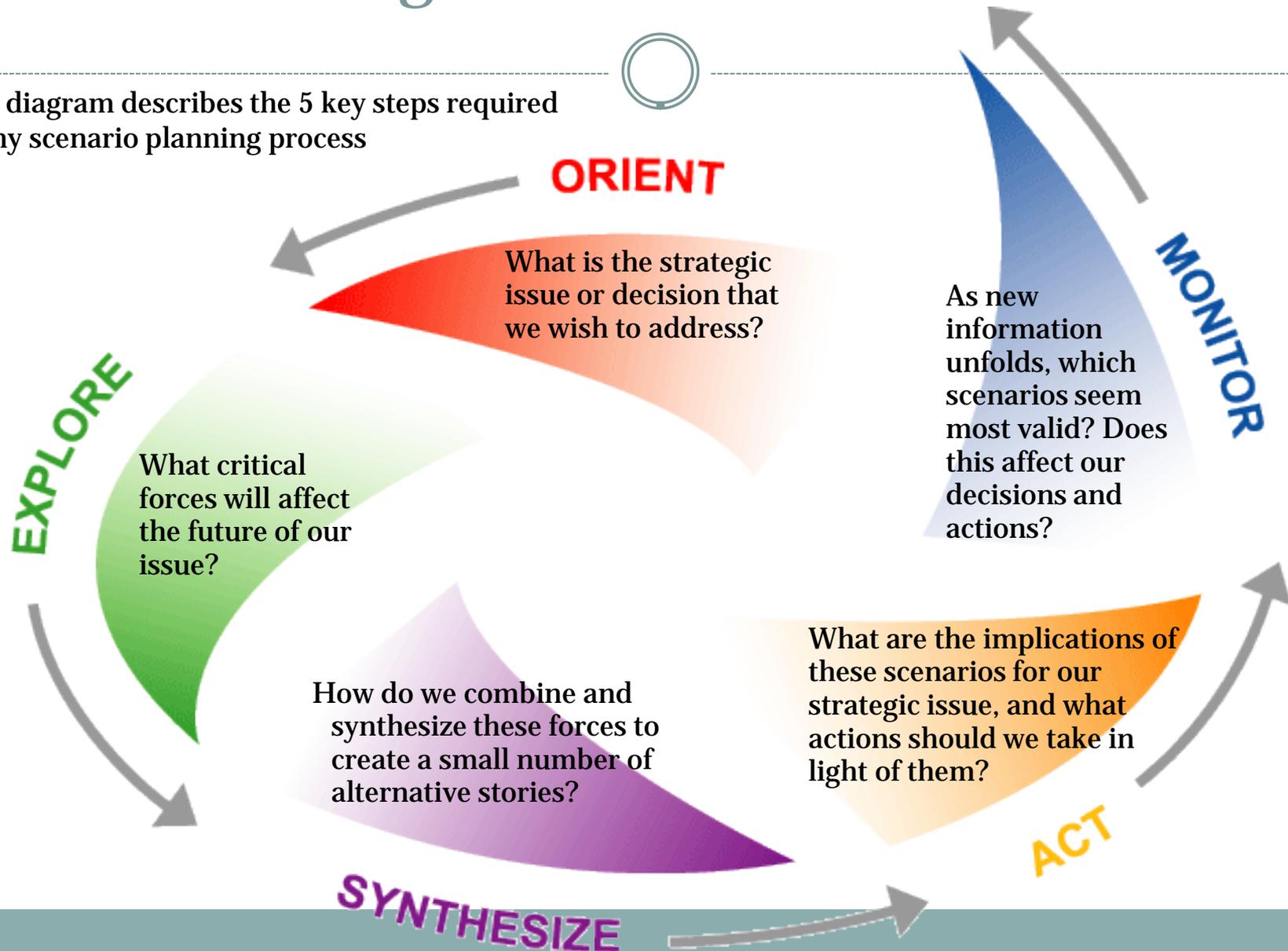
## **Jellyfish Delight**

The world of 2030 spoken from Will Douglas's grandson Buddy:

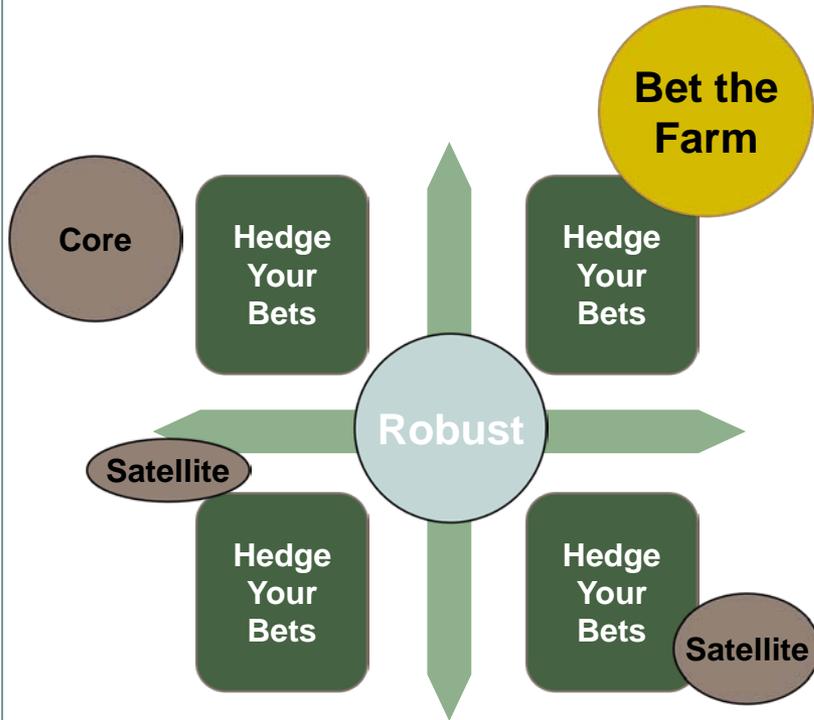
Will's family started Fisherman's Paradise Lodge in 1950. Today, Will's grandson Buddy is facing a drastically different world than his father Bill was raised in. In 1950 no limits existed for sport fishing, and fishermen drove the bears away. By 2000, the bear population had increased dramatically under NPS protection, and it was catch and release only for trout and only one salmon could be kept, which was bad enough for Bill and his clients. But today (summer 2030) you're lucky to catch anything, and regulations are such that Buddy and his clients are rarely allowed to try. Business has collapsed, not just for Buddy, but all the sports and commercial industries. Tourism, even on the coast, isn't much of an option either – the collapse of the marine food web and flooding of breeding grounds from severe storms have made it difficult to spot the seabirds, seals, sea lions, and brown bears that attracted the tourists there in the first place, and the easiest way to get the lodge from Anchorage is flying, which few can afford nowadays. Eight hours of Buddy's time every week is tied up traveling to endless community meetings in King Salmon or Anchorage for any number of projects proposed by the NPS and the public to manage fish resources. The local tribal communities are fiercely competing with sport fishing businesses like Buddy's, an exhausting process for Buddy who spends plenty of time on the advisory groups for federal and state bag limit processes, particularly because the docks at Fisherman's Paradise camps and King Salmon have been washed out by repeated flooding and abandoned by the NPS and others, forcing Buddy to fly or boat without good landing sites. The NPS isn't paying attention to Buddy's problems – they're distracted by the need to rebuild and retrofit park facilities and roads from flooding, including loss of archeological sites. Luckily, state and federal funding have gushed into the region to build new fisheries hatcheries and fish farms, while some brave residents have begun shifting commercial and sports activities to the few marine species still thriving in the ocean. Buddy is looking into re-opening historic canneries for fish hatcheries and processing jellyfish, a growing industry in the region where residents have been forced to shift diets. At the national level, policy decisions to reduce GHG emissions have been implemented across the board and research scientists are crawling over the landscape, but Buddy is certain that any benefits coming from these changes won't be felt in his lifetime.

# Turning Scenarios into Actions

This diagram describes the 5 key steps required in any scenario planning process



# Categorizing Options to Help Set Strategy



**Robust:** Pursue only those options that would work out well (or at least not hurt you too much) in any of the four scenarios

OR

**Bet the Farm / Shaping:** Make one clear bet that a certain future will happen — and then do everything you can to help make that scenario a reality

OR

**Hedge Your Bets / Wait and See:** Make several distinct bets of relatively equal size

OR

**Core / Satellite:** Place one major bet, with one or more small bets as a hedge against uncertainty, experiments, and real options

# Robust Recommendations (both groups)



- **Make climate change an organizing principle for park priorities**
- **Document the arctic experience as an interpretive effort**
- **Structure a coordinating entity to deal with impacts of climate change (agency, state, native, NGO)**
- **Coordinate emphasis on I&M of both social and natural systems**
- **Consider park mandates and enabling legislation under changing conditions**