Uncertainty: Climate Change
Past Implications

• The system in the past 50 years has dried as available, measured water. Much faster than precipitation, due to warming temps.
• Changes in the trends are seasonal, seasonal variations impact salmon differently
• Less snow pack at lower elevations
• Increase turbidity, decrease salmon
• River has changed physical course and character
• Introduction of new species or suitability
• Increased frequency of wildfires
• Increase erosion, decreased cover increased stream temps.
• Increasing productivity generally
• Increase sport fishing, longer season extending to year-round
Uncertainty: Climate Change

Future Implications

• Water temperature changes
• Greater time spent in lethal temps for salmon
  • Primarily in non-glacial rivers/streams
• Loss of intolerant species
• More interaction with invasive plant species
• Increasing utility to active regions by the rest of the world – population and marine traffic due to open arctic marine
• Increase population, climate refugees
• Early emergent timing for juveniles in the spring
• Changes in hydrological regimes – melt, glacial, wetland drying – different seasonal hydrographs (Saltwater intrusion in freshwater)
• Rising sea levels
Uncertainty: Regional Economy
Past Implications

• Boom and bust - (driven by oil and gas)
• Alaska has tended to act as a trading post – lack of manufacturing and value adding and more exporting of natural resources
• Changes in the refuge boundaries in the 1940s enabled oil and gas development
• Healthcare needs have grown dramatically
• Land use in SC has changed from land productivity to focused on selling land for residential uses instead
• Limited zoning, few resections on private development
• Trophy fishing has been a driver of tourism
• Single commercial fishing industry for last century in the Kenai
• Increase in regulatory regimes
• Ending of fishing traps
• More complex and interrelated management system for the river
Uncertainty: Regional Economy
Future Implications

• More people growing local food due to longer season
  • Agriculture increase
• Potential water supply issues
• May limit the retiree tax benefits
• Greater demands on resources including byproducts
• LNG industrial traffic
• Significant population increases
• Potential for transportation access from Anchorage – ex. Ferry system or bridge to anchorage
• Increase the culture due to increase in population – ex. more urbanized
• Partial size shrinking
• Decrease in sport fish guided industry due to crowding
• Limited access for public to rivers
• Boom and Bust (again)
• More blockage of rivers – due to energy flows
• Salmon becoming less important to the economy
Uncertainty: Ocean Conditions
Past Implications

• Temperature changes affecting run timing
• Salmon abundance increased with 70s warm ocean shift
• It is a big black box that we still don’t understand
• Asian economic growth pushing pollution to Alaska shores – impacts?
• Huge changes in global fishing regulations
• Changes in warmer temps = new / different species coming in to Alaska
• Fishermen changing species that they are fishing for due to availability (diversifying of permits)
• Concern for caring capacity of ocean species
• Increase attention to bycatch now
Uncertainty: Ocean Conditions

Future Implications

• Still a big black box
  • Likely to be reactive to problem without understanding causes
• Locally more red tides
• Redistribution of marine populations
• Increase invasive species in ocean, not just freshwater systems
• Ocean acidification
• Salmon run timing affected
• Consumption advisories
• Loss of prey
• Impacts of global disasters, man made or natural – ex. repeat of 1964 earthquake
• Increase in aquaculture due to new technologies
• Relative sea level rise
• Need for increased farming of marine products
• Arctic opening drives increase of traffic and pollution
• More international pressure due to arctic environment
• Might increase local support businesses, associated with oil and gas
Uncertainty: Increased Population & Competition

Past Implications

• Loss of habitat
• Greater pressure on resources
• Loosely controlled development
• Road building and fish passage issues
• Changes in harvest selection
• Introduction of impervious surfaces and storm water systems
• Increased use of PU fisheries has changed emphasis away from commercial, which makes it harder to manage escapement – pressure on managers to increase PU allocation
• Increased population makes managing harvest more complex
• More important harbor uses – increased port use
• Increased water pollution impacts the river
• Increasing pressure to have access
• Changing use patterns – sports fishery and boats – PU fishery
• Affects on riparian areas – loss of habitat and regulations
• Loss of Marine derived nutrients – less going upstream
• Increased invasive spp.
Uncertainty: Increased Population & Competition

Future Implications

• Changing demographic composition in both users and voters
• More development of marginal areas such as soils that are not suited for use
• Need for long term management plan to be more proactive – see everything in the past
• Less interest in fish and fishery conservation
• Loss of culture, shift of culture to less of a land ethic
• Cumulative increase of pressure use and development on the mouth of the Kenai
• More interest in fish and more conflict
• Less local participation more outsiders coming in to fish
• Increasingly complex regulatory for land use and fishing
• Aggregation and industrialization of harvest activities
• If PFD goes away, benefits to seniors go away, population could decrease – everything above relates to an increase in population
• More likely to have a demographic switch than a population change
Uncertainty: Sport Fishing
Past Implications

• Less guided fishing more individual sport fishing overall
• Increased in regulatory complexity
• Focus on trophy fish has led to size selection
• Sport fishing increases pollution
• More catch and release practices in the river
• Increase pressure on resident species
• Impacts on habitat
• Increase of invasive – plants, fish, etc.
• Both positive and negative impacts on local residents (tourism)
• Guide academy, increase educational programs for guides, sport fishing in the classroom
• Political organization to influence policy
• Pressure on city and state parks
• Increased crowding
• Increased bear / wildlife interaction
• Increased conflict with commercial fishing industry
• Allocation changes, changes in escapement goals, etc.
• Drives fluctuations within the local economy, and can be a stabilizer
• Culture of fishing from sport to harvest...
• In the past people would go fish for the frying pan – changing the character of fishing
• Experience of fishing has changed (see two above)
Uncertainty: Sport Fishing
Future Implications

• Provides pathway for people to connect with resource values
• More reliance on ranched (salmon) and stocked (lakes) fish – fisheries
• Increased fishery you get increased water pollution, water quality, invasive
• With decrease size of kings less interest in sport fishing, trophy fish hunting, or switch to different species e.g. pressure on coho
• Increase in shoulder season, people fish in rivers outside of the Kenai river. Spillover growth.
• Mat-Su increased infrastructure that leads to decrease in fisheries here - What happens in Mat-Su affects what happens here
• Regulatory complexity continues to increase
• More interest in guided fishing
• Increased expectation for harvest returns – which may be contradictory to salmon population trends
• More interest in marine sport fishing
• Increased demand on services – infrastructure; toilets, roads, parking, emergency services, hospitality
Uncertainty: Personal Use Fisheries

Past Implications

- River use and congestion in lower river
- Water pollution
- Demand for infrastructure
- Highway traffic
- Management complexity
- Law enforcement
- Social issues
- Shift of where decisions are made (BoF to more political, legislature)
- Significant impact on local government services
- Changes in attitudes and how they utilize salmon, and expectations
- Increased conflict between locals and other alaskans
- Habitat degradation
- High use doesn’t correlate to economic gain
- Generated a new niche of dipnet gear
  - Advertised as a party
  - 1996 dipnetting was created as a category
  - Complete different demography – voting perspective as well as fishing
  - Locals move south to places like Kasilof in peak seasons
- Increased awareness of land ethic
Uncertainty: Personal Use Fisheries

Future Implications

• Increased regulations
• Increase in the burden of local government to deal with the trash and pollution
• New infrastructure development demands
• Changes to the delivery of sockeye to the in-river allocations and impacts to the sport fishery
• Potential continued pressure on allocation to preferred personal use over sport and commercial
• Continued growth and use has more negative impacts
• We may have more management tools and practices as a result of more people having salmon
• New areas of fishing – pressure may decrease on the Kenai and move to different areas
• Pressure on commercial fishing
• Habitat degradation