

Alaska Climate Impact Assessment: A Commissioners Summary of Findings

Captain Bob Pawlowski
Executive Director

Alaska Fisheries Development Foundation
&

Commissioner
Alaska Climate Impact Assessment Commission

Climate Change & Alaska

- Alaska Climate Impact Assessment Commission
<http://www.housemajority.org/coms/index.php?c=38>
- Alaska Department of Environmental Conservation
<http://www.climatechange.alaska.gov/index.htm>
- Alaska Center for Climate Assessment and Policy
<http://www.uaf.edu/accap/>
- Arctic Climate Impact Assessment
<http://www.acia.uaf.edu/>

Climate Change & Alaska

“There is little doubt that Alaskans are feeling the effects of climate change more than anyone else in our nation. Regardless of whether these changes are caused solely by human activity, we must take steps to protect people in the Arctic.”

~ Senator Ted Stevens, July 11, 2007

- Repeated comments by people everywhere
 - Mothers for Alaska
 - Alaska Youth for Environmental Action
 - Native community leaders
 - Local residents
- Traditional knowledge has changed over a “*generation*”
 - Ice conditions not safe
 - Wind and snow fall tells different story
 - Bird and marine mammal migrations are different
 - Salmon species spawning on the North Slope

Commission understanding

- *“climate change presents unavoidable challenges to the citizens of Alaska”*
- *“Successful adaptation strategies that recognize the environmental, cultural, and economic factors will be the keys to reducing the adversity of climate change.”*
- *“informed decision-making will need objective, reliable data, continued monitoring activities in the field and at sea, and the most up-to-date research we can acquire”*

Alaska Challenges

- Change is ongoing in Alaska
- Informed decision-making is essential
 - Reliable data
 - Monitoring programs
 - Up to date research
- Funding challenges
 - Federal funds more restricted and declining
 - State funds will need to cover difference
- State and federal agencies impacts
 - Program priorities and redirection
 - Budgets

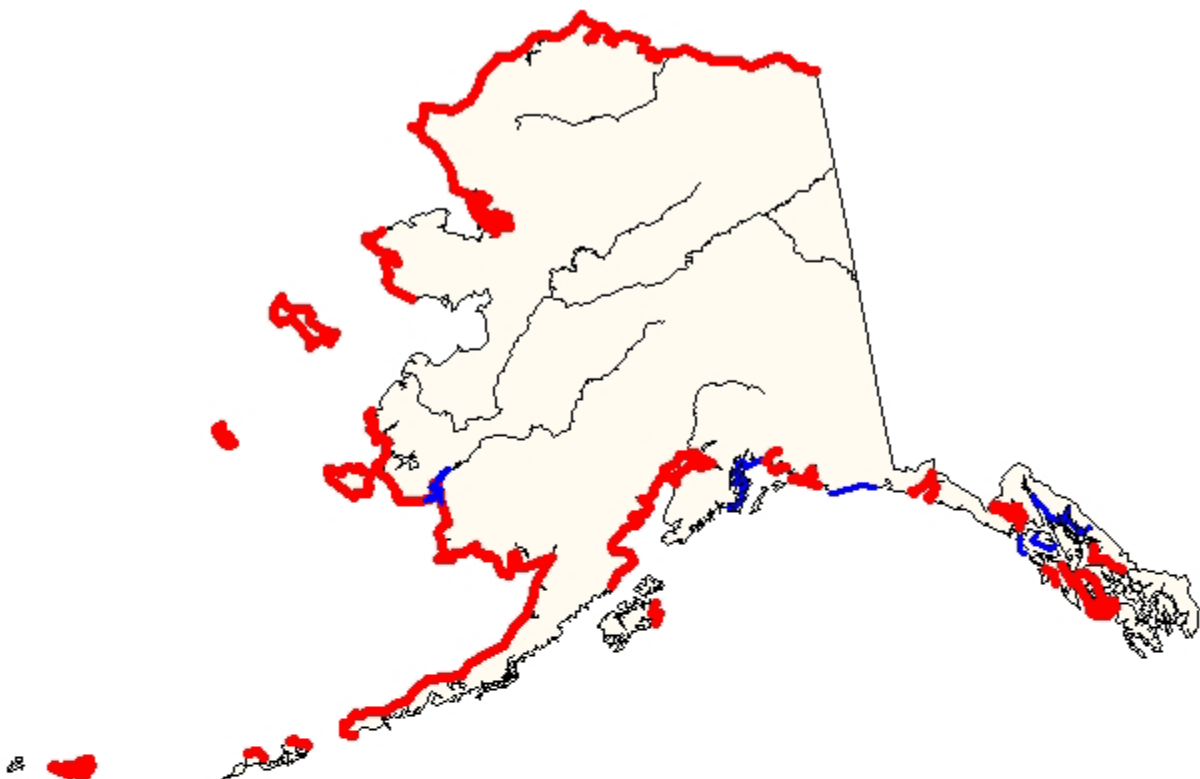
Definitions

- ACIA definitions (ACIA-2004)
 - Adaptation:
 - to attempt to limit adverse impacts by becoming more resilient to the climate changes that will occur while society pursues the first set of actions
 - Mitigation:
 - to slow the speed and amount of future climate change by reducing greenhouse gas emissions
- Adaptation needs are written throughout report
 - AK DMVA & FEMA “mitigation” consistent with “adaptation”
- Mitigation not addressed

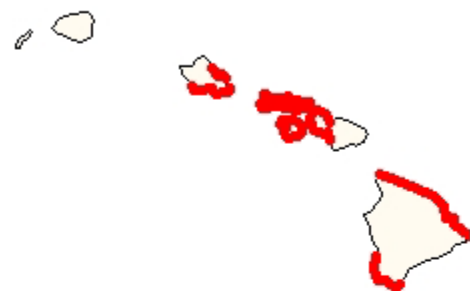
Climate Commission Report

- Adaptation focus
 - Mitigation for DMVA consistent with adaptation
- Best served by Administration
 - Governor's Sub-Cabinet
 - Designated Liaison
- Series of observations
 - Challenge of village relocation
 - Subsistence issues
 - Research potential
 - Best practices and engineering needs
 - Mapping & monitoring

Alaska



Hawaii



Puerto Rico



KEY

Compiled Shoreline (pre- 1993, Analog) 

Compiled Shoreline (post- 1993, Digital) 

Economic Decisions

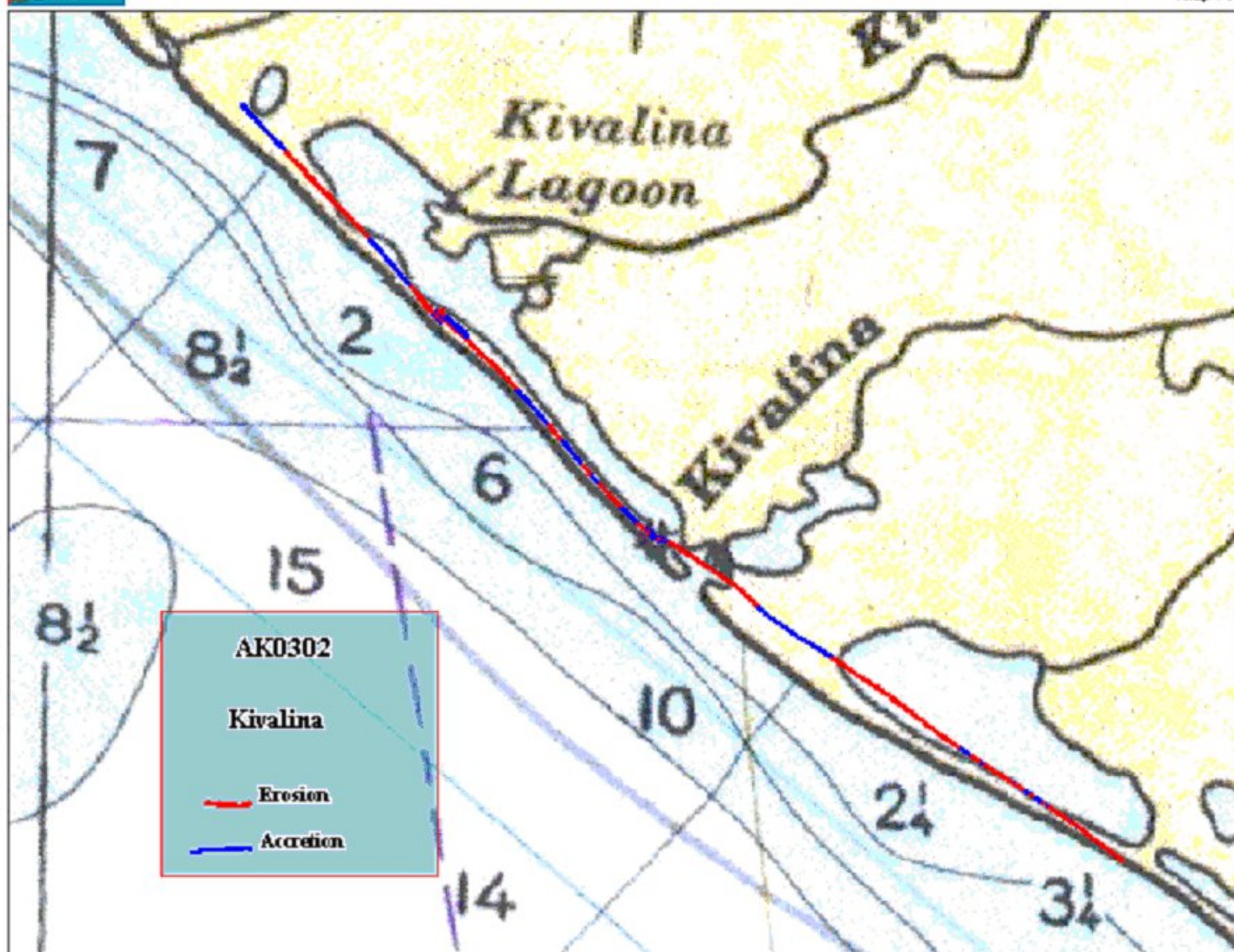
- Heightened awareness of Alaska's dynamic environment by citizens and policy makers
- Recommendations support
 - State and federal monitoring programs
 - DGGS & federal mapping programs essential
 - Decisions based on science and engineering
 - Plans for infrastructure development on NW and Arctic Coast
 - Federal funding for ice breakers
 - Public education of Alaska dynamics and adaptation strategies

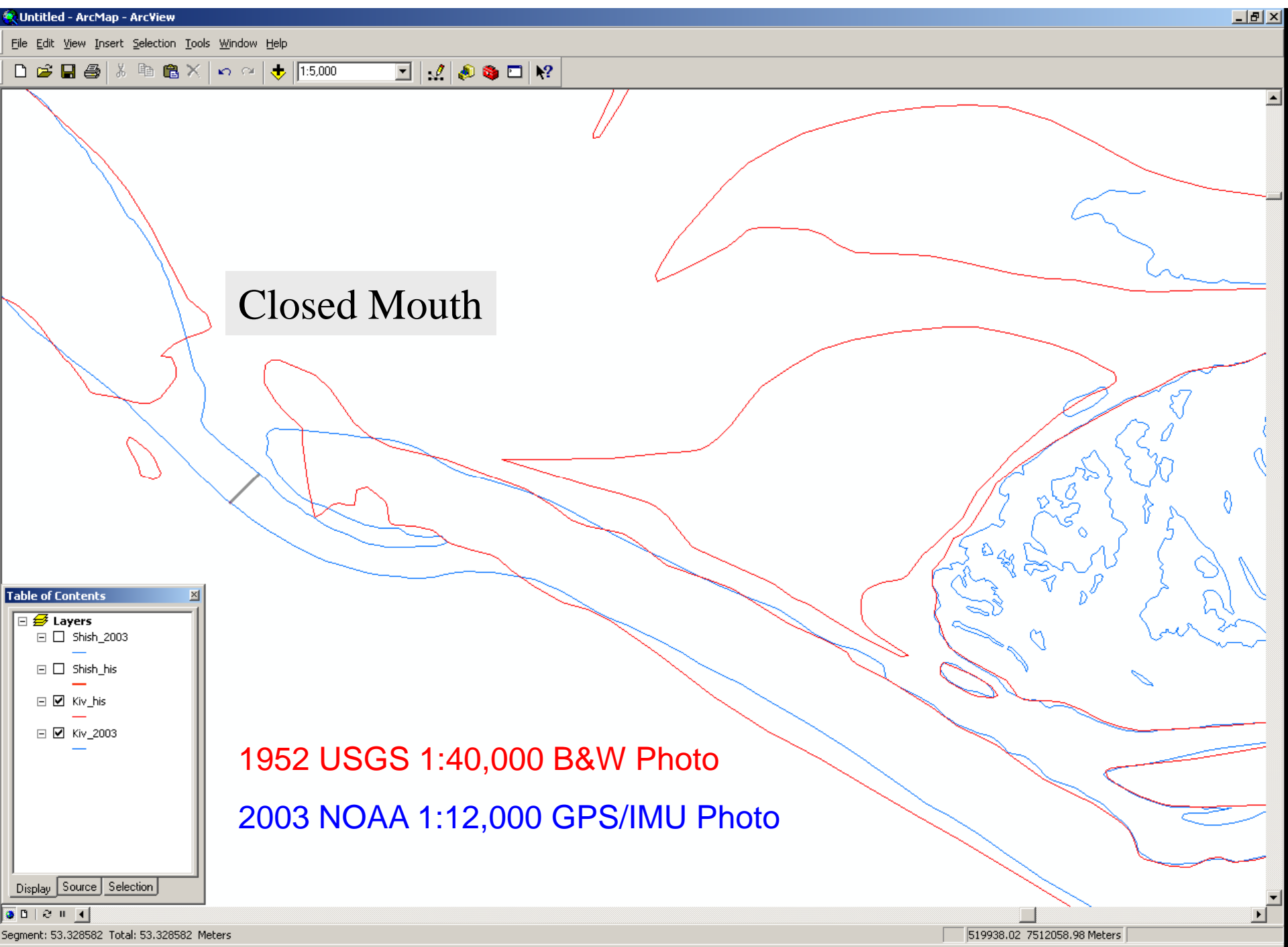
Economic Impacts

- Fishing/Hunting/Subsistence
 - Range shifts while managing for sustainability
- Federal Spending
 - Uncertain & not optimistic
- Insurance Industry
 - Risk mitigation and cost sharing
- Marine Transport
 - Arctic Marine Shipping Assessment
- Economic value of Research
 - Public and Private ~\$300M
- Tourism
 - Positives for summer and negative for winter tourism

Alaska Communities

- Land Use Issues
 - Regulations & Administrative Orders
- Technical Mapping Updates
 - Inadequate and outdated mapping
 - Adequate and accurate vertical datum
 - Digital Ortho-imagery
 - Coastal Water Level needs
- Threatened Communities
 - 6 identified and in progress
 - 160+ under study (AVETA)
 - Alaska's most immediate challenge
 - A unified vision
 - Future funding
 - Overall assistance for others





Natural Resources

- Natural Resource Development essential
 - Alaska environment dynamic
- Negative impacts with changes to
 - Physical environment & climate
 - Useful life of infrastructure
- Positive impacts with changes to
 - Transportation enhancements & efficiencies
- No changes to regulatory framework
- Research needs statewide
 - Best data for engineering decisions
 - Regulatory decisions
 - Sustainable development

Natural Resources (cont)

- Fisheries
 - Changes going on with distribution and seasons
 - Species mix and bycatch
 - Stay present course
 - State-Federal Management
 - Scientifically supported precautionary approach
- Forestry and Wildlife Impacts
 - Boreal forest shifts
 - Wildfires
 - Increased fires and expenses
 - Fires suppression costs
 - Public health aspects

Engineering for Adaptation

- Land of extremes addressed by practice
 - TAPS & environmental challenges
- ISER model (2007)
 - 10% increase cost
 - Degradation of infrastructure
 - Economies may offset costs
- Improved strategies for Alaska
 - Infrastructure designed for adaptation
 - Standards
 - Engineering “peer review” essential
- Best Practices
 - Proposals reflecting best practices
 - Research to keep best practices current
 - University training of engineers

Erosion, Flooding and Engineering

- The fundamental issue of infrastructure
 - ACIA defined
 - State Federal effort
 - AVETA
 - Governor's Sub-cabinet
 - Denali Commission
 - Data
 - State of the Arctic Report
 - Precipitation Frequency Estimates (PFE)
 - Mapping & GPS datums
 - Water levels consistent with future shipping
 - Anecdotal Information

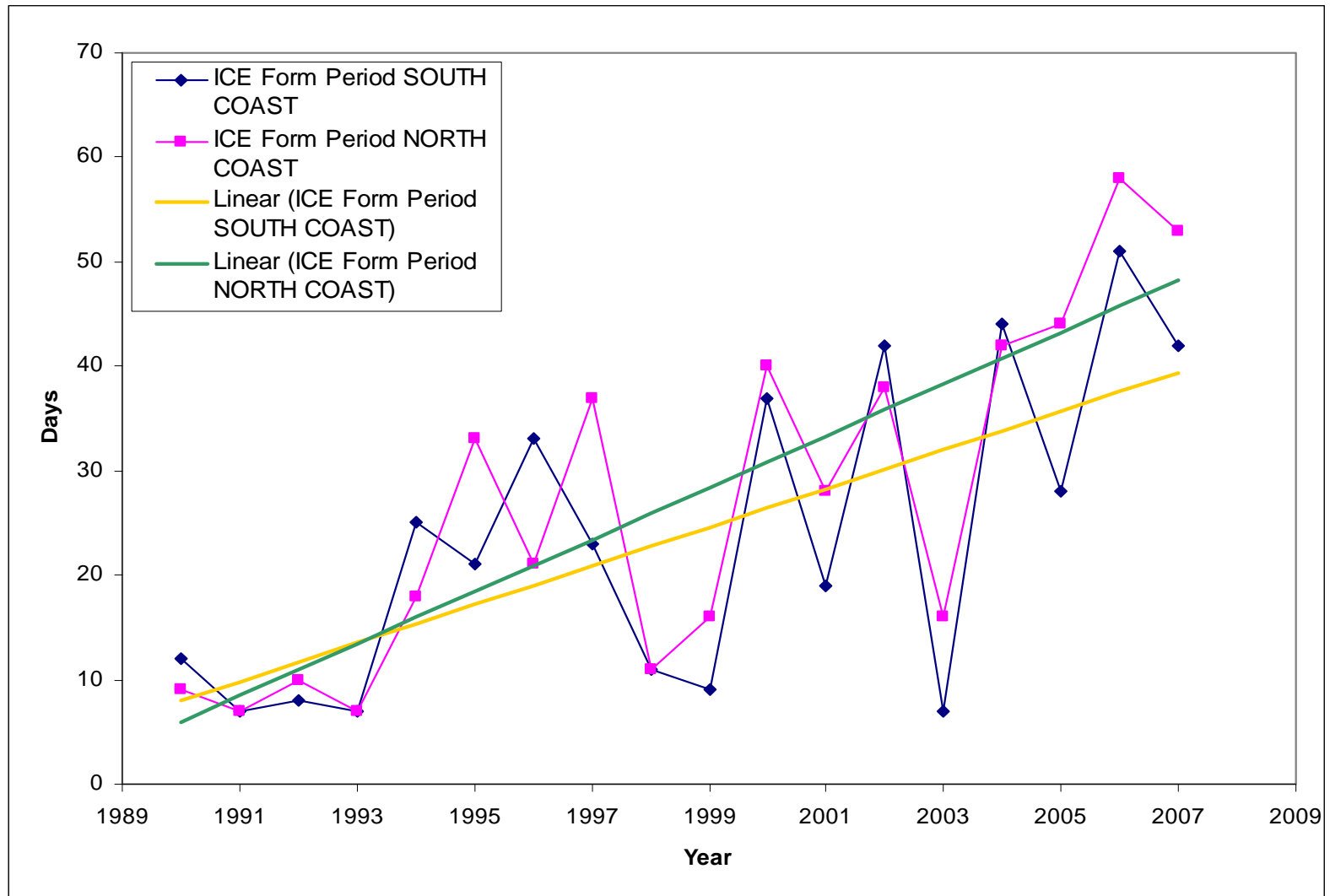
State & Other Agencies

- Sub-cabinet for Climate Change
 - Collaboration between ACIAC and Sub-cabinet
 - Endorsement of Sub-cabinet process
- 7 State agencies impacted
 - Precise budget impacts uncertain
 - Each have own specific mission impacted
 - Brought together with Sub-cabinet leadership
- Other Agencies
 - Dependence on Federal Programs & Data bases
 - Denali Commission
 - USACE projects
 - Interior, Agriculture, Commerce & EPA data bases and services

Research & Monitoring

- Positive implications for Alaska
 - \$92 M & 2,400 jobs
 - \$151 M new research
 - IPY significant
- Alaska Arctic is largest climate change
 - Temperature and climatology models & monitoring
 - AOOS model
 - Environmental and storm surge
 - Species migration & loss

Chukchi Sea Coastal Freeze-up



Data from Kathleen Cole, NWS Ice Forecaster

Research Coordination

- Coordination and communication essential
 - Central Project & inventory
- Interagency Groups needed
 - Maximize benefits & minimize duplication
- Data Management
 - GINA
- Improved weather & ocean observations
 - NOAA Hazard Resilient Coastal Communities
- Improved Sea Ice Forecasts
 - Models and climatology data base

Expanded Research Agenda

- Improved Aviation Weather Observations
 - Doppler Radar, TAMDAR, & AON projects
- Technology
 - Gliders, AUV, AIS, CODAR, Satellites
- Commercial Fisheries Research
 - Fisheries and Marine Mammals
 - Commercial & subsistence questions
- Ecosystem Research
- Ocean Acidification

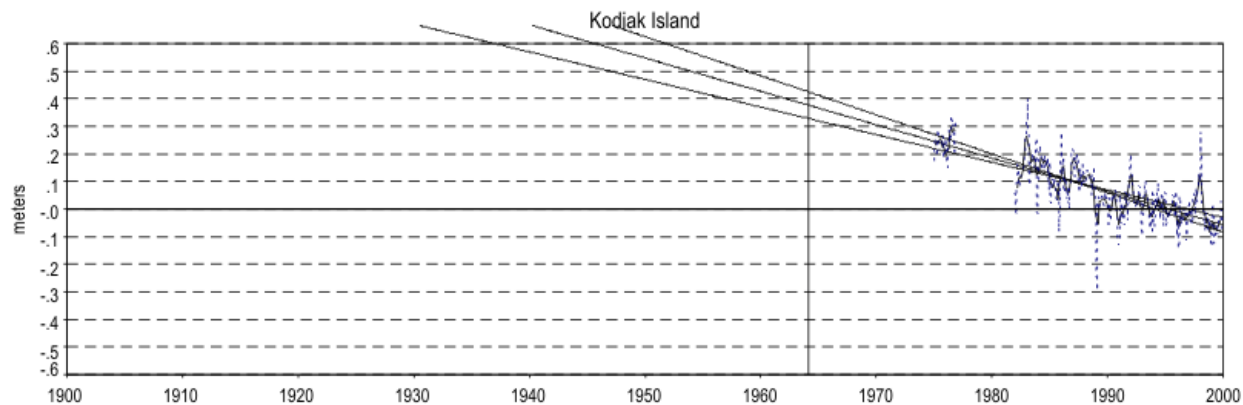
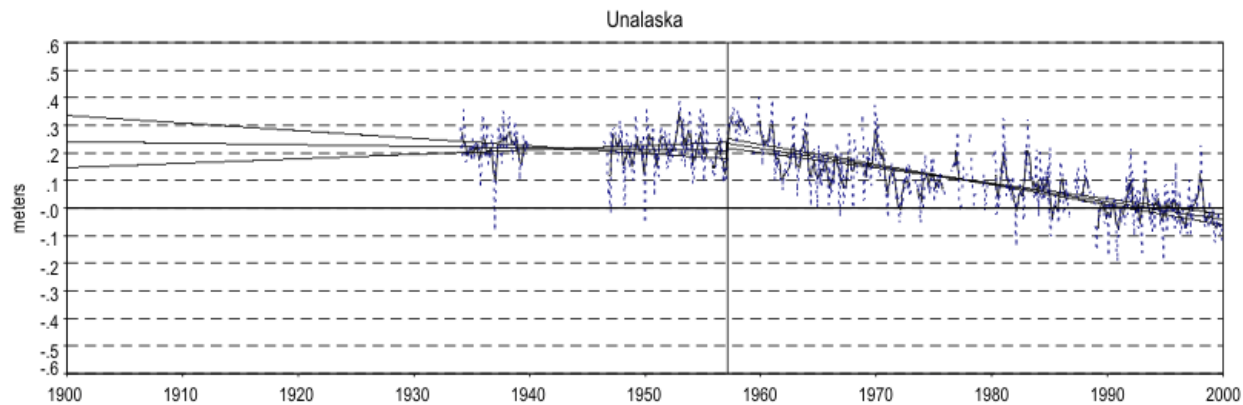
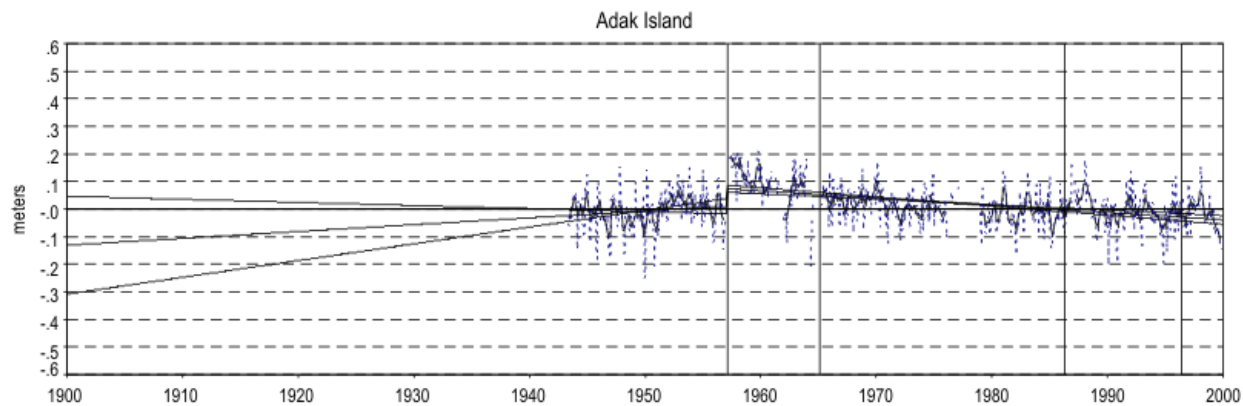
Expanded Research Agenda

- Coastal Inundation
 - Erosion & Tsunami
- River Flooding & Freshwater Flow
 - Precipitation Frequency Estimates
- Drought & Wildfire
 - Transportation and suppression
 - Hydrologic research & models
- Permafrost Thaw
 - Research on rates and patterns of coverage
- Mapping
 - Shoreline and Bathymetry

NOAA NWLON

Gauges in Alaska





Shoreline
change with
tectonic
activities along
the Aleutian
and Kodiak
Islands

(http://www.co-ops.nos.noaa.gov/sltrends/sltrends_stations.html) with specific stations

Legislated Recommendations

- Coordinated Process for Village Relocation
- Capital Project Planning
- Federal Efforts
 - Coastal Mapping
 - Tide Stations
 - USCG Presence
 - Ice breakers
- Public Infrastructure
 - Assessment
 - Failing water and sewer

Legislated Recommendation

- Residential Needs
 - Loans for protecting homes
- Arctic Research
 - Broadbased
- Continuation
 - Governor's sub-cabinet
 - Legislated authority
 - Liaison

Concluding thought

- *“One of the greatest benefits of the heightened awareness of climate change to economic development is that policymakers and citizens are now fully aware that we live in a dynamic natural environment, and we always have. Thus adaptation will be required, as it always has been, even if not always recognized.”*