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FERC 101 / Alaska

Mandatory Conditions & Authorities

Matt Love
Member, Seattle

Aug. 30, 2011
Girdwood, Alaska

Roadmap

- Federal Power Act (FPA) Requirements
  - FPA §§ 4(e), 10(a): Comprehensive Development/Public Interest Conditions
  - FPA § 10(j): Fish and Wildlife Agency Recommendations
  - FPA § 4(e): Federal Reservation Conditions
  - FPA § 18: Fishway Prescriptions
  - Energy Policy Act of 2005 (EPAct 2005): Trial-Type Hearings and Alternative Conditions
  - FPA §§ 10(e), 10(f): Annual Charges and Headwater Benefits Charges
- Other Federal Statutory Requirements

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FPA Requirements

Permissive Conditions

- Comprehensive Development/Public Interest Conditions, FPA §§ 4(e) and 10(a)
  - Imposed by FERC to ensure a project that is "best adapted" to numerous, often competing public interests
  - Broadly includes conditions for power generation, recreation, fish and wildlife protection and enhancement, water supply, irrigation, and navigation
    - FERC must give "equal consideration" to developmental and non-developmental interests
  - Any party to licensing process can request these conditions
  - FERC can modify or reject these recommended conditions
  - All conditions must be supported by "substantial evidence"

Permissive Conditions (con't)

- Fish and Wildlife Agency Recommendations, FPA § 10(j)
  - Imposed by FERC based on recommendations of federal and state fish and wildlife agencies
  - Narrowly includes conditions for protection, mitigation and enhancement of fish and wildlife (and their habitat) affected by the project
  - FERC can reject Section 10(j) conditions that are "inconsistent with the purposes and requirements" of the FPA, but only after meeting with the submitting agency in an attempt to resolve the inconsistency

Mandatory Conditions

- Federal Reservation Conditions, FPA § 4(e)
  - Applies only to projects that fully or partially occupy a federal "reservation"
  - Submitted by federal resource agency administering the reservation (typically U.S. Forest Service (USFS) or U.S. Department of the Interior (DOI))
  - Conditions must be "necessary for the adequate protection and utilization" of the reservation
  - Conditions are not limited to the reservation lands at the project
  - FERC cannot reject or modify § 4(e) conditions
  - Section 4(e) conditions subject to review by U.S. courts of appeal

Mandatory Conditions (con't)

- Fishway Prescriptions, FPA § 18
  - Authorizes the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) to impose the construction and operation of "fishways" at licensed projects
  - Agencies typically reserve authority to prescribe fishways at later time
  - FERC cannot reject or modify § 18 fishway prescriptions
  - Section 18 fishway prescriptions subject to review by U.S. courts of appeal

Mandatory Conditions (con't)

- Trial-Type Hearings on Mandatory Conditions, EPAct 2005
  - FPA amendment allows a fact-based challenge to § 4(e) conditions and § 18 prescriptions
  - Available to all licensing parties
  - Limited to "disputed issues of material fact" with respect to the condition or prescription
  - Hearing before agency administrative law judge (ALJ)
  - Time- and resource-intensive 90-day process from commencement to ALJ findings
  - ALJ findings of fact binding on agency
  - Generally: Few projects completed full hearing; value in reaching settlement

Mandatory Conditions (con't)

- Alternative Mandatory Conditions, EP Act 2005 (FPA § 33)
  - Authorizes licensing parties to submit alternative § 4(e) condition or § 18 prescription
  - The issuing agency must accept the alternative if it:
    - Provides adequate protection (for § 4(e) conditions) or will be no less protective of agencies' prescription (for § 18 prescriptions); and
    - Either costs significantly less to implement or results in improved project operation
  - Agency must provide written statement demonstrating that it gave "equal consideration" when adopting any § 4(e) condition or § 18 prescription
  - Generally: Agencies do not adopt alternative conditions/prescriptions, electing instead to modify their initial submissions after reviewing the alternatives

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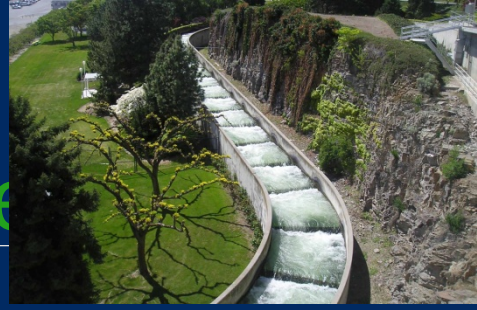
Administrative Conditions

- Administrative Annual Charges, FPA § 10(e)(1)
  - Requires FERC to assess "reasonable" annual charges for administration of the FPA licensing program, including the administrative costs of federal agencies (typically DOI, USFS, NMFS)
  - Based on installed capacity (municipal projects) or a combination of installed capacity and generation (non-municipal projects)
  - Some municipal projects may qualify for exemption from payment
- Federal Land Use Annual Charges, FPA § 10(e)(1)
  - Based on a per-acre fees schedule adopted by FERC in 1987
  - Currently, nationwide fee ranges from $3.76 to $150.48 per acre
  - In early 2011, a group of hydro licensees successfully challenged a FERC rule seeking to substantially increase the fee range to $7.70 to $6,160.68 per acre
  - Some municipal projects may qualify for exemption from payment
- Headwater Benefits Charges, FPA § 10(f)
  - Requires licensees to reimburse owners of upstream projects for increased hydroelectric capacity due to the operation of upstream facilities
  - Limited to "interest, maintenance, and depreciation" of the headwater facilities
  - Typically result in settlements for non-federal headwater projects
  - FERC regulations adopt complex modeling formula for calculating fees for federal headwater projects

Other Federal Statutory Requireme



- National Environmental Policy Act (NEPA)
- Endangered Species Act (ESA)
- Clean Water Act (CWA)
- Coastal Zone Management Act (CZMA)
- National Historic Preservation Act (NHPA)

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For more information, please contact:

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For more information about Van Ness Feldman's hydroelectric practice, please visit: http://www.vnf.com/practices-18.html

Aug. 30, 2011
Girdwood, Alaska

National Hydropower Association

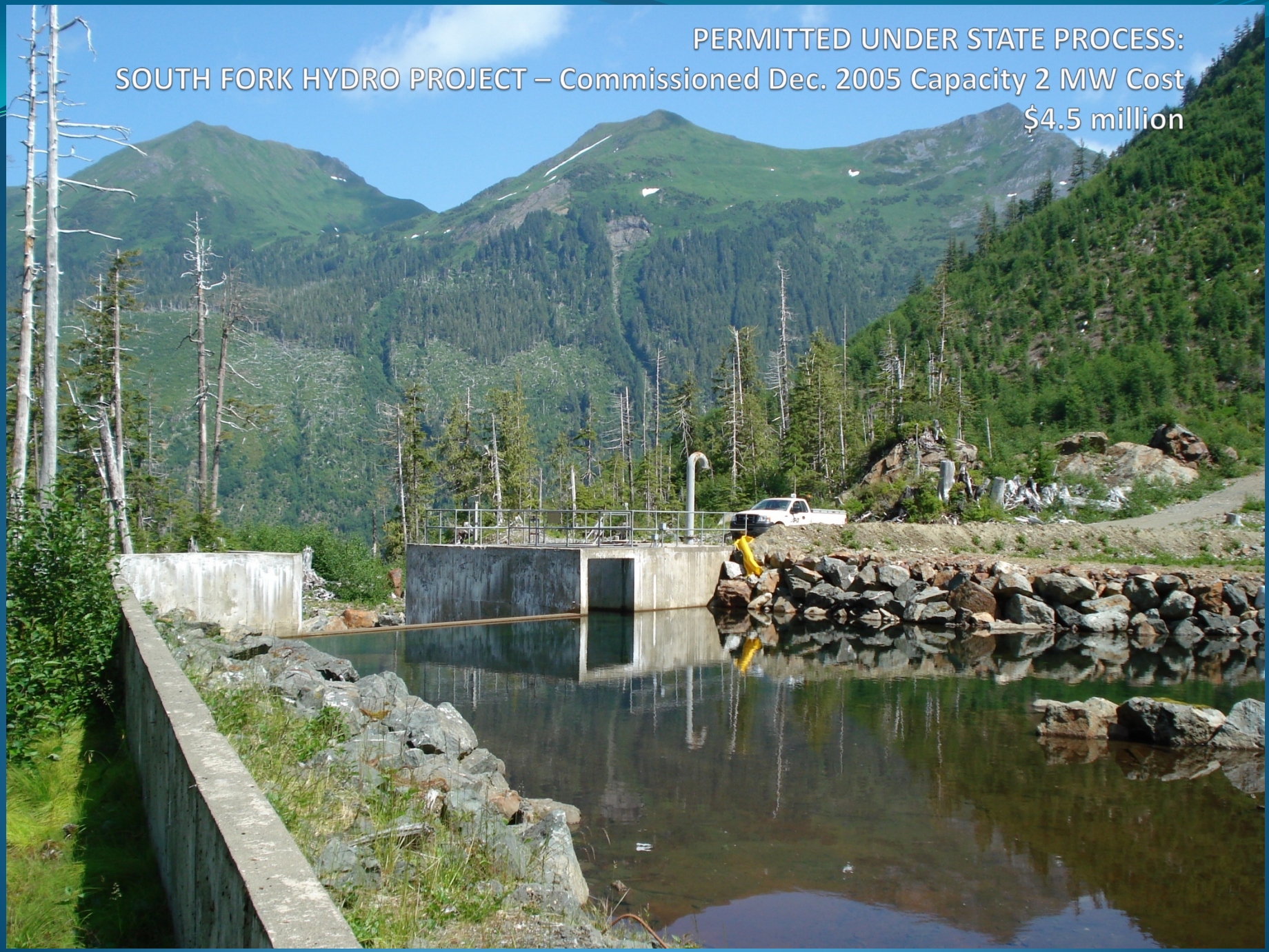
Alaska Regional Meeting

August 2011, Girdwood, AK

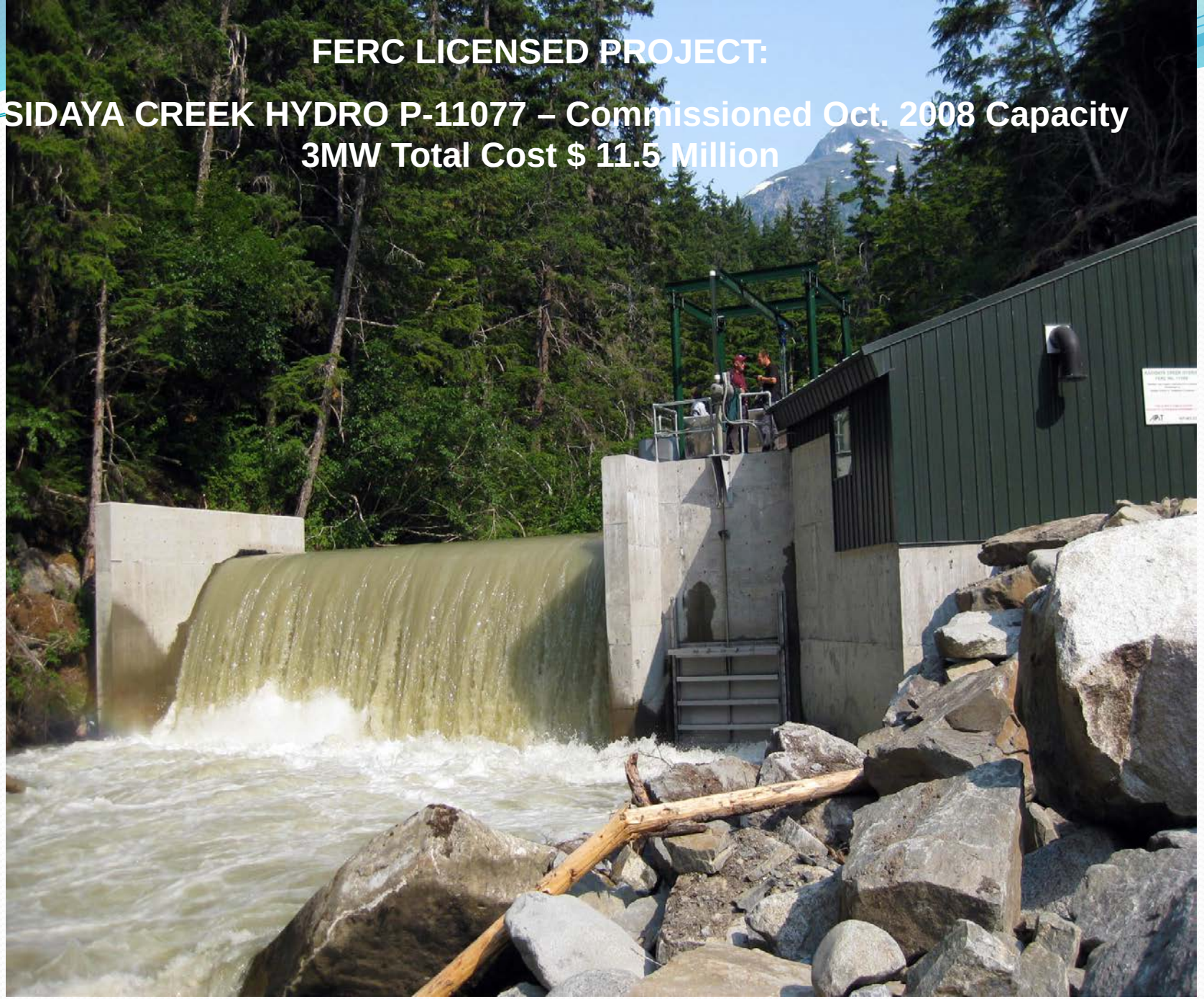
Alaska Power & Telephone

Presentation on the

Tale of Two Projects
One FERC
One Non-FERC


PERMITTED UNDER STATE PROCESS:
SOUTH FORK HYDRO PROJECT – Commissioned Dec. 2005 Capacity 2 MW Cost $4.5 million

PERMITTED UNDER STATE PROCESS:
SOUTH FORK HYDRO PROJECT



FERC LICENSED PROJECT:

SIDAYA CREEK HYDRO P-11077 – Commissioned Oct. 2008 Capacity 3MW Total Cost $ 11.5 Million


FERC LICENSED PROJECT:
KASIDAYA CREEK HYDRO P-11077

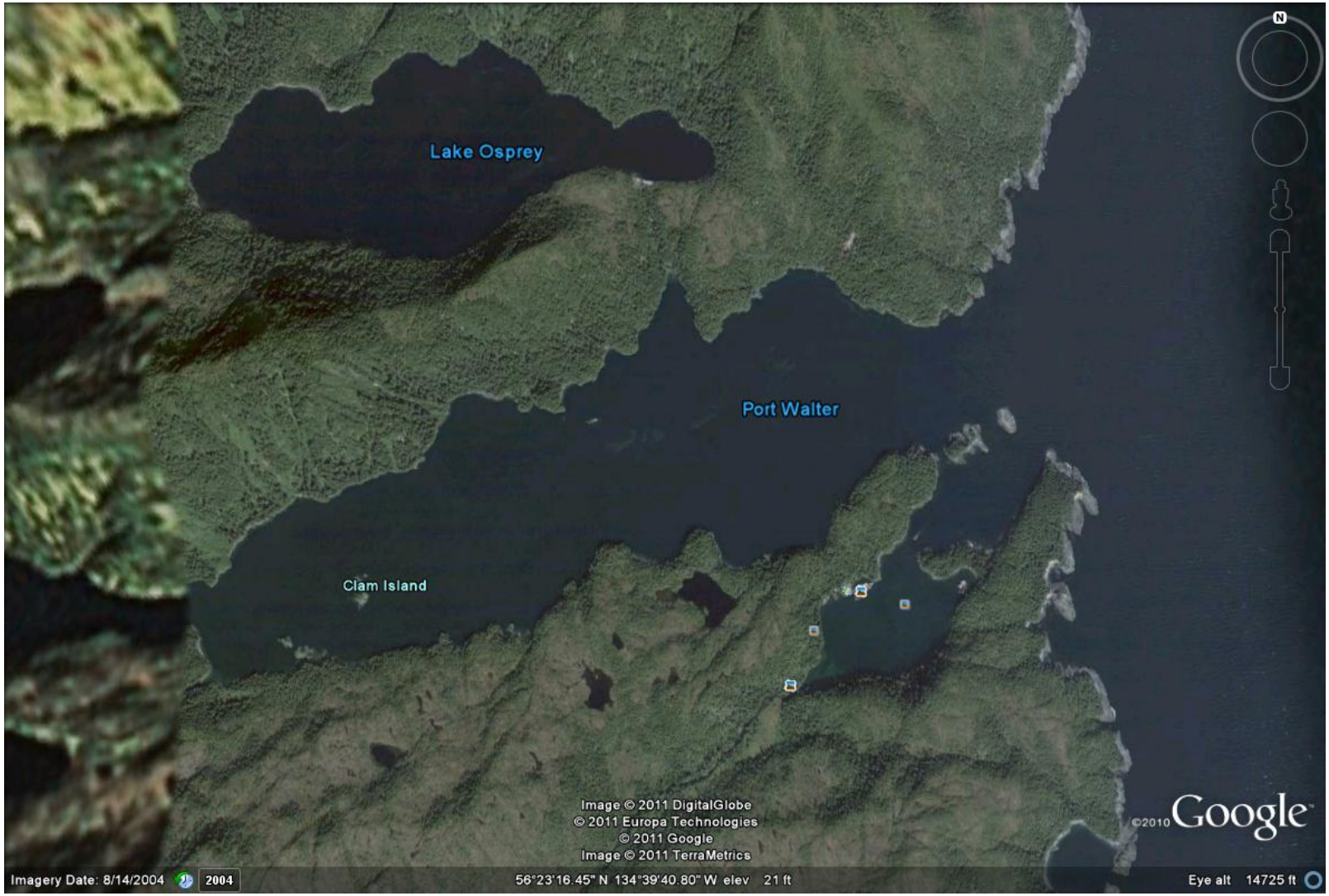
What State Laws apply to FERC and Non-FERC Hydropower Project in Alaska

- Water Rights (in all cases) Alaska Statute (AS) 46
- Habitat Permit (in all cases, if located on fish stream) AS 16
- DNR Land use (if occupying State land, tideland, submerged lands) AS 38
- Power Plant Building Fire Code Compliance (in all cases) AS 13
- Alaska Coastal Management Program Title 40 did sunset at 12:01 AM, Alaska Standard Time, on July 1, 2011 per AS 44.66.030. (Did apply to FERC and Non-FERC Projects)
- Dam and Reservoir Safety (if Dam is more than 10 feet in Height and not under FERC) AS 46
- Sand & Gravel (for material located upon State Land) AS 38
- Private Land Rights (to avoid trespass; purchase, lease, easement, etc…)

Why seek a Non-jurisdictional ruling from FERC?

- No Comprehensive Environment Document required. (NEPA)
- Dealing with local State and Federal agencies without the lengthy (time determined) FERC process and scoping and re-scoping.
- Flexibility in design during construction allows value engineering to occur and logical response to new site information by eliminating FERC Non-capacity License Amendments.

Lake Osprey Remote Micro-Hydro



Little Port Walter station is located on U.S. Forest Service land in Tongass National Forest and is accessible only by boat or floatplane.

The station is in a small estuarine bay adjacent to Chatham Strait near the open Gulf of Alaska and is ideally suited for a broad range of studies on Alaska's fisheries.

Sashin Creek with natural runs of salmonids flows into the head of the bay where daily counts of salmon entering and leaving the stream are made.

These and other LPW studies provide important long-term data sets to help NOAA Fisheries better understand affects of climatic changes on fluctuating populations of marine resources.

Two NOAA Fisheries families live at LPW year-round. Other NOAA scientists periodically commute from TSMRI to conduct research projects.

During peak seasonal periods 20 researchers and support staff may be living and working at LPW.

http://www.afsc.noaa.gov/ABL/MSI/msi_lpw.htm

NMFS Long-term Fisheries Research Station, 1934 - present

Little Port Walter 75 years of fisheries research
75kW (expandable to 150 kW)
or 22,000 gal diesel barged, stored and burned annually

Project Environmental Permitting, 2007 - 2011

Current Project Permitting Status:

- Draft EA
- Special Use Permit – pending
- Forest Plan Amendment pending
- Roadless Rule Exemption – hoping
- Funding - ?

Current Information Requests:

- The approximate number and size of trees to be removed
- When does NMFS expect to send FS the EA?
- Is NMFS planning to start work on the hydroelectric project this winter?
- If so, when is NMFS hoping to finalize the Special Use Permit?
- The Region's 'Sensitive Issues Review' was this week and NMFS is anxious for an update on the status of this project.
- But, our funding is uncertain at best.

Science, Service, Stewardship

NMFS Hydropower Program: regulatory authorities and information needs

Sue Walker
Fisheries Biologist
Hydropower Coordinator
National Marine Fisheries Service
Alaska Region

NOAA FISHERIES SERVICE

NOAA
FISHERIES
SERVICE

NOAA Fisheries Service: Who We Are

- An agency of the National Oceanic and Atmospheric Administration (NOAA), within the Department of Commerce

- The mission of the agency is to ensure stewardship of living marine resources through science-based conservation and management, and the promotion of healthy ecosystems

NOAA FISHERIES SERVICE

NOAA Fisheries Service: Who We Are

Habitat Conservation

Seafood Inspection

Science and Technology

Sustainable Fisheries

Protected Resources

Aquaculture

Law Enforcement

International Affairs

NOAA
FISHERIES
SERVICE

NOAA Fisheries Service

Office of Habitat Conservation

Conducts national, regional, and community-based activities to protect and restore habitat vital for healthy ecosystems and sustainable fisheries.





NOAA
FISHERIES
SERVICE

NOAA Fisheries Service

Office of Protected Resources

Conserves, protects, and recovers threatened and endangered marine species under the authority of the Endangered Species Act and the Marine Mammal Protection Act

NOAA FISHERIES SERVICE

What We Do – Federal Consultations

There are nearly 30 legal authorities and additional guidance that drive our habitat conservation programs. The primary legal authorities include

- Magnuson-Stevens Act
- Fish and Wildlife Coordination Act
- Endangered Species Act
- Marine Mammal Protection Act
- Federal Power Act

NOAA FISHERIES SERVICE

Magnuson-Stevens Act Essential Fish Habitat

Congress, 1996: "One of the greatest long-term threats to the viability of of commercial and recreational fisheries is the continuing loss of marine, estuarine and other aquatic habitats.

Habitat considerations should receive increased attention for the conservation and management of fishery resources of the United States.

NOAA FISHERIES SERVICE

Essential Fish Habitat:

"Those waters and substrates necessary to fish for spawning, breeding, feeding or growth to maturity. Waters include aquatic areas and their associated physical, chemical and biological properties. Substrate includes sediment underlying the waters. Necessary' means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem. Spawning, breeding, feeding, or growth to maturity covers all habitat types utilized by a species throughout its life cycle."

NOAA FISHERIES SERVICE

EFH Consultation:

Federal agencies must determine whether its actions may adversely affect EFH

If so, the agency must prepare an EFH assessment including a description of action, analysis of adverse effects, agencies conclusion on effects, proposed mitigation

NMFS will provide conservation recommendations

NOAA FISHERIES SERVICE

Federal Power Act

FPA Section 18: Mandatory fishway prescriptions for safe, timely, and effective fish passage

FPA Section 10(j): Recommendations for flows and other beneficial measures for protection, mitigation, and enhancement of fish and their habitat

FPA Section 10(a): Recommendations and/or plans for comprehensive development of the waterway for adequate protection, mitigation & enhancement of fish & wildlife

Adaptive Management

FPA Section 18 Reservation of Authority

NOAA FISHERIES SERVICE

FPA: Section 18 Prescriptions

The Commission shall require the construction, maintenance, and operation by a licensee at its own expense of

. . . such fishways as may be prescribed by the Secretary of Commerce . . .

NOAA FISHERIES SERVICE

FPA: Section 10(j) Recommendations

Section 10(j): "All licenses issued . . . shall be on the following conditions . . .

(1) That in order to adequately and equitably protect, mitigate damages to, and enhance, fish and wildlife (including related spawning grounds and habitat) affected by the development, operation, and management of the project, each license issued . . . shall include conditions for such protection, mitigation, and enhancement . . . [S]much conditions shall be based on recommendations received . . . from the National Marine Fisheries Service"

NOAA FISHERIES SERVICE

Section 10(a) Comprehensive Plans and Recommendations

Section 10(a)(1): All licenses issued . . . shall be on the following conditions:

- That the project adopted . . . shall be such as in the judgment of the Commission will be best adapted to a comprehensive plan for improving or developing a waterway or waterways . . . for the adequate protection, mitigation, and enhancement of fish and wildlife (including related spawning grounds and habitat)

Section 10(a)(2): In order to ensure that the project adopted will be best adapted to the comprehensive plan . . . the Commission shall consider each of the following:

- (A) The extent to which the project is consistent with a comprehensive plan (where one exists) for improving, developing, or conserving a waterway or waterways affected by the project that is prepared by—
  - (i) an agency established pursuant to Federal law that has the authority to prepare such a plan . . .
- (B) The recommendations of Federal and State agencies exercising administration over flood control, navigation, irrigation, recreation, cultural and other relevant resources of the State in which the project is located . . .

NOAA FISHERIES SERVICE

Adaptive Management

How can we utilize adaptive management techniques to account for climate change during the duration of 30 to 50 year licenses?

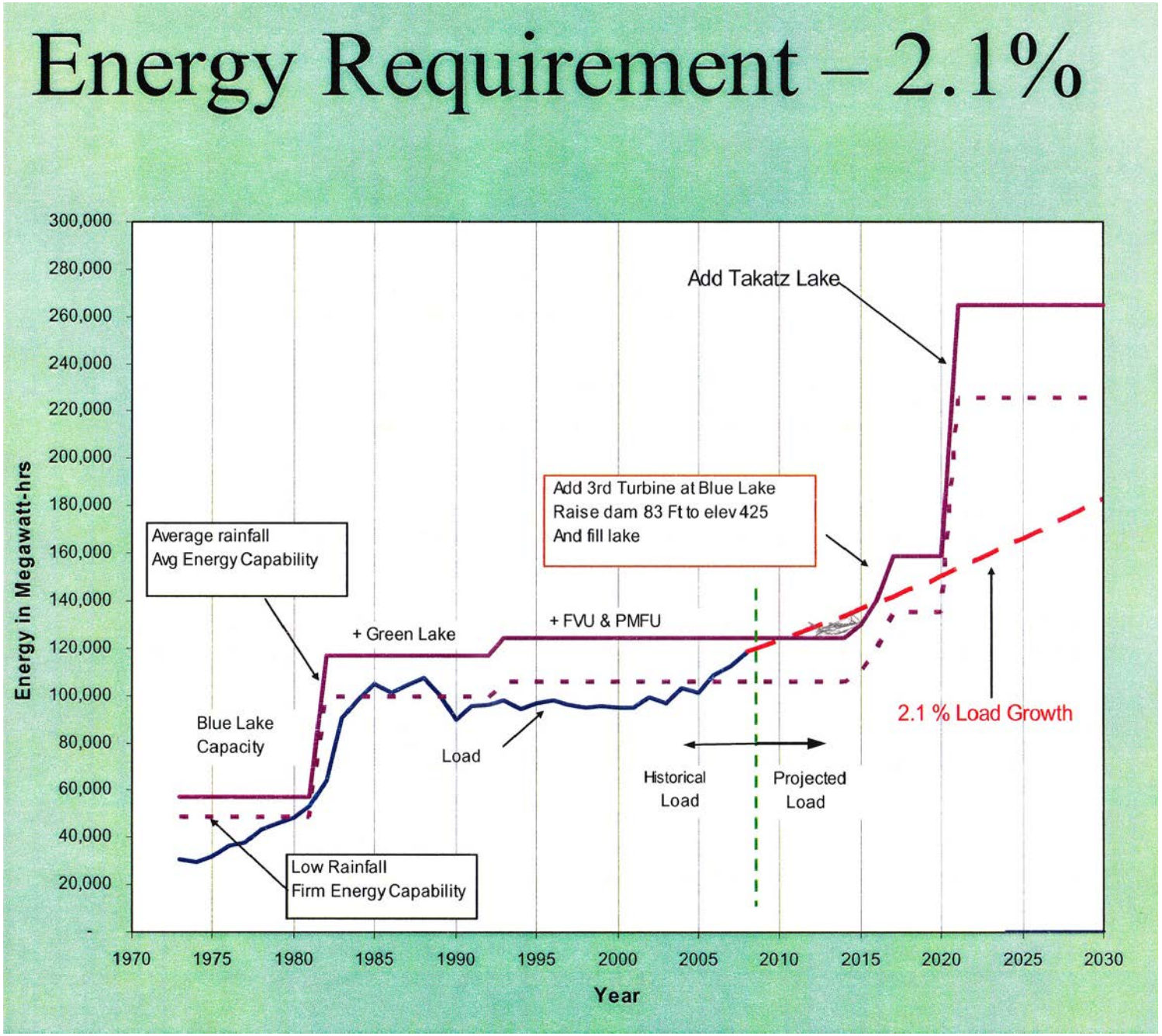
Impacts of Climate Change and Variability on Hydropower Systems: results from Southeast Alaska and lessons for Susitna

Jessica Cherry (UAF/IARC/INE), Sue Walker (NOAA-NMFS),
Nancy Fresco (UAF/SNAP), Sarah Trainor (UAF/SNAP/ACCAP),
Amy Tidwell (UAF/INE)

Outline

- Climate sensitivity of hydropower
- Impacts of climate change
- Impacts of climate variability
- Lessons for Susitna

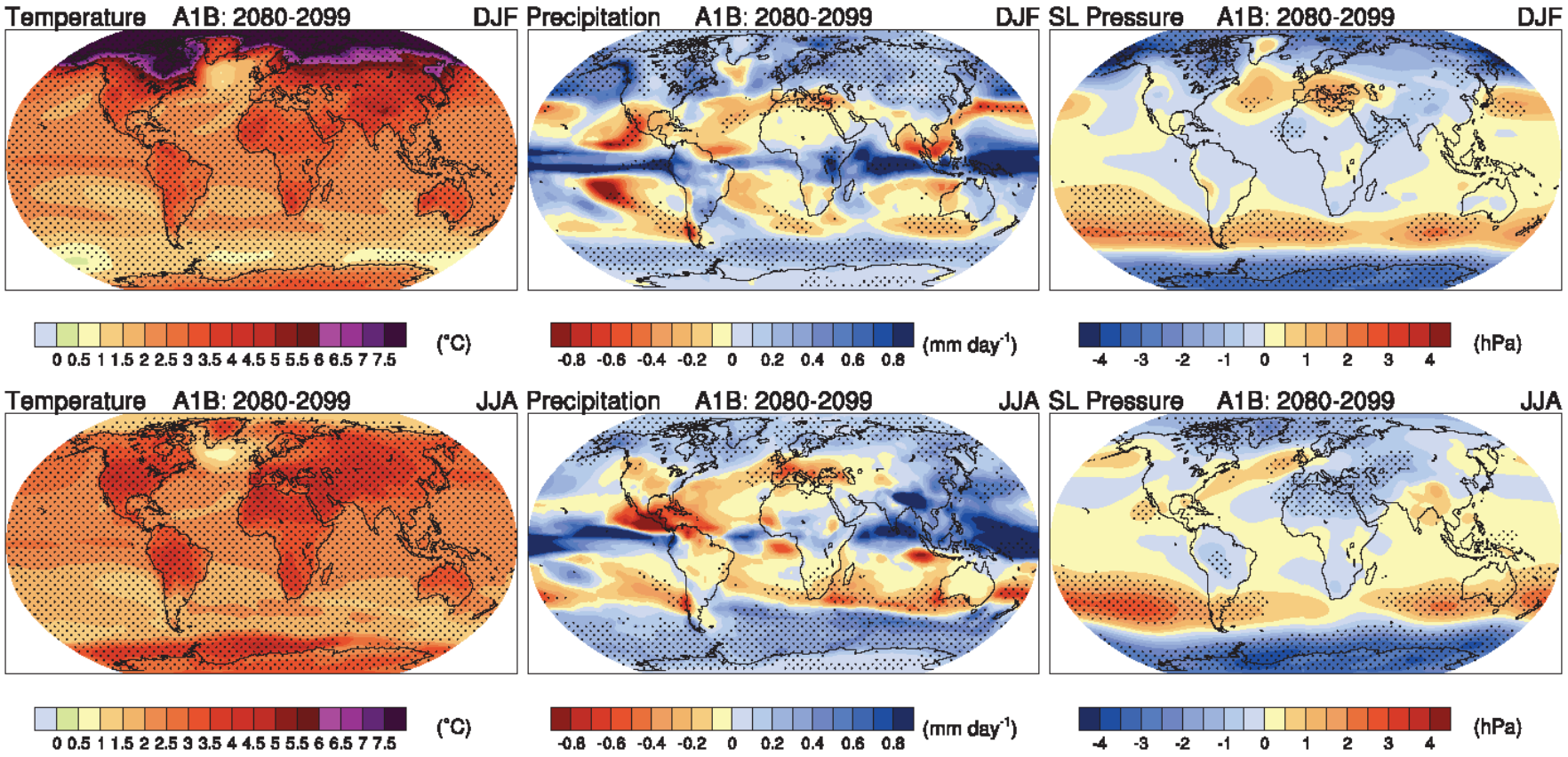
Energy Requirement – 2.1%



SITKA Facilities, courtesy Chris Brewton

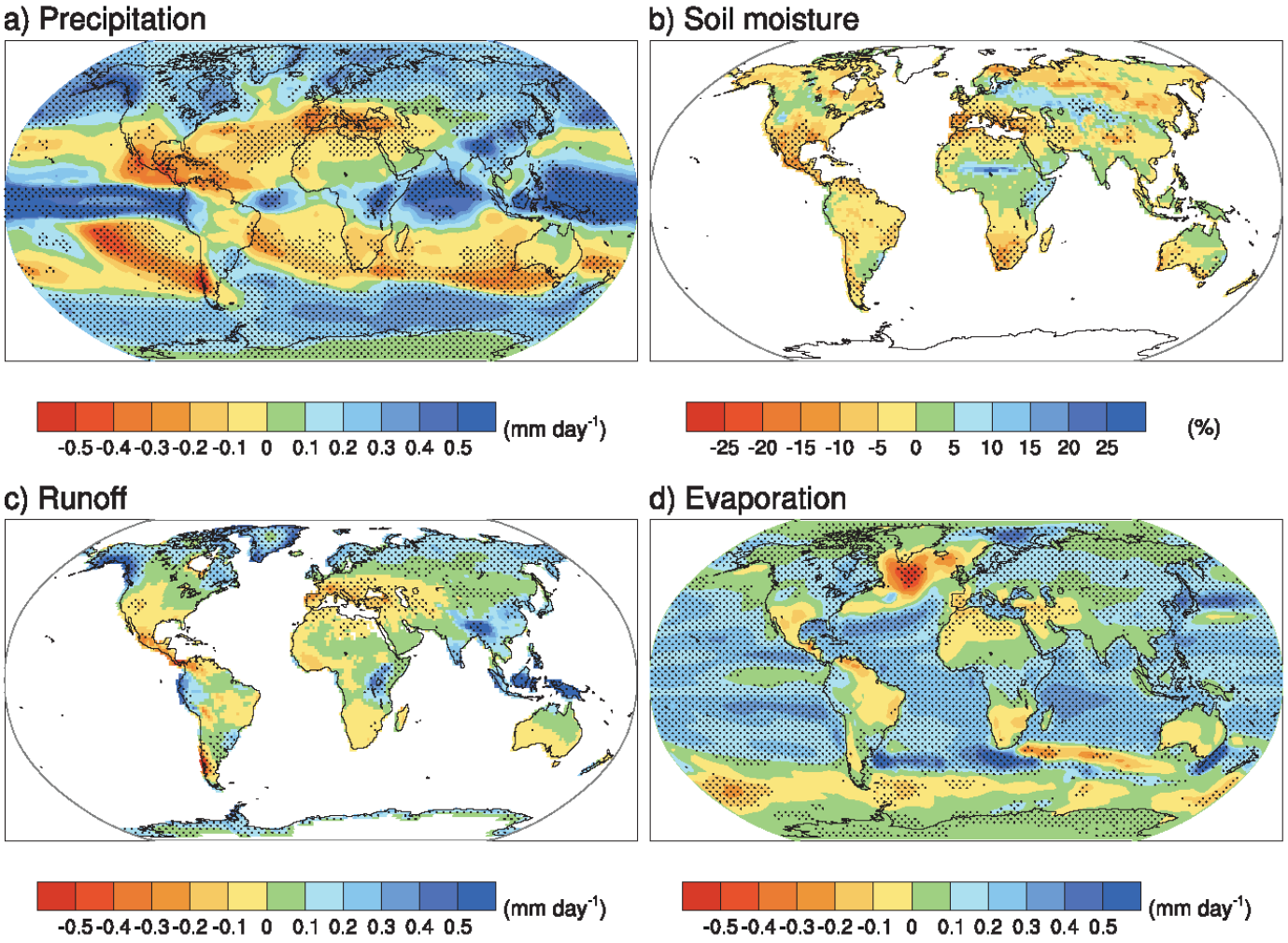
Long-term Climate Change Projections: good for hydropower

Projected temperature, precipitation, and pressure changes



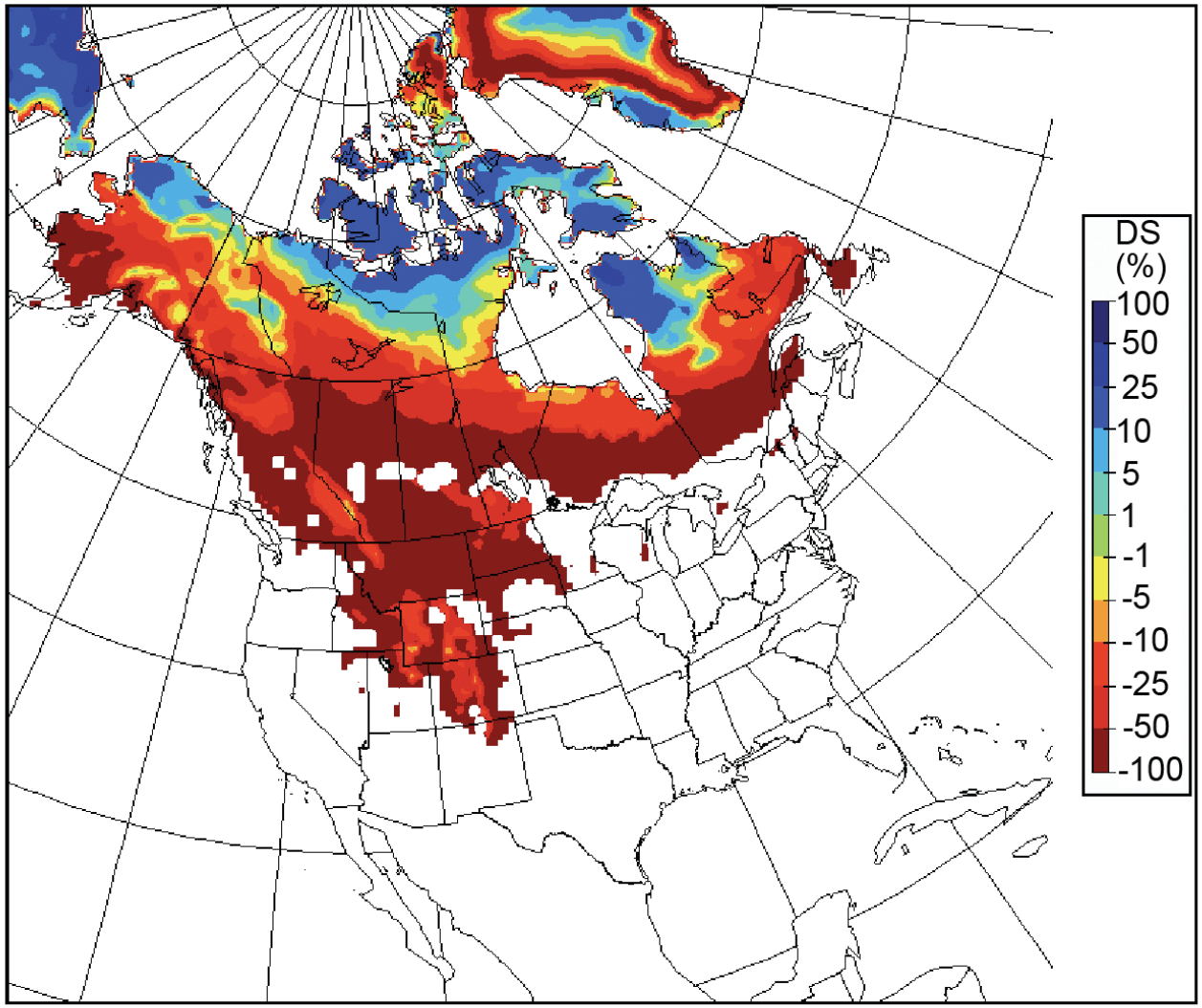
IPCC AR4, 2007

IPCC projected water cycle changes (missing permafrost, glacier feedbacks)



Meehl et al., 2007

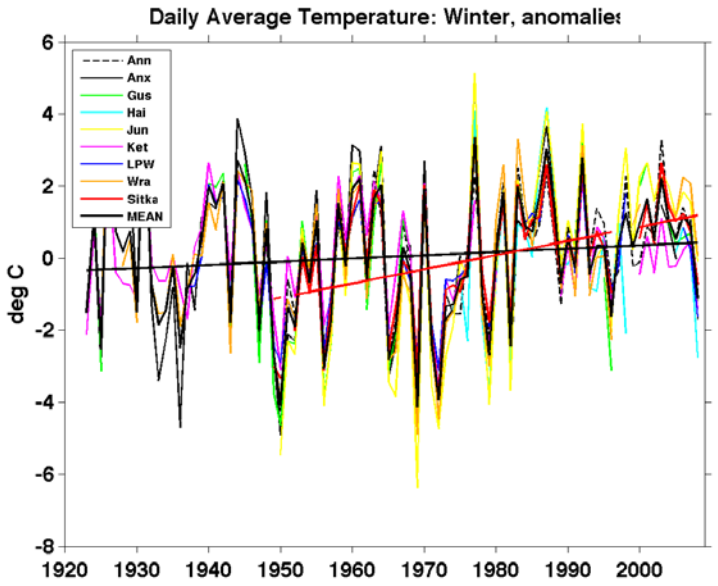
Projected spatial snow cover change

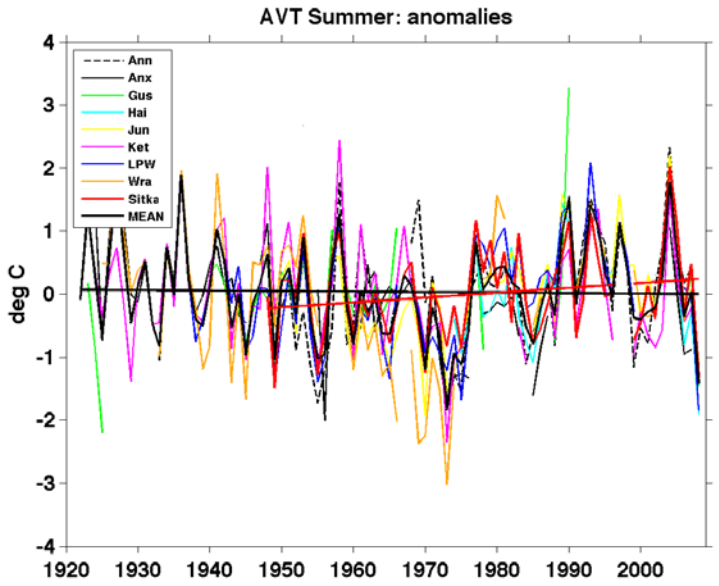


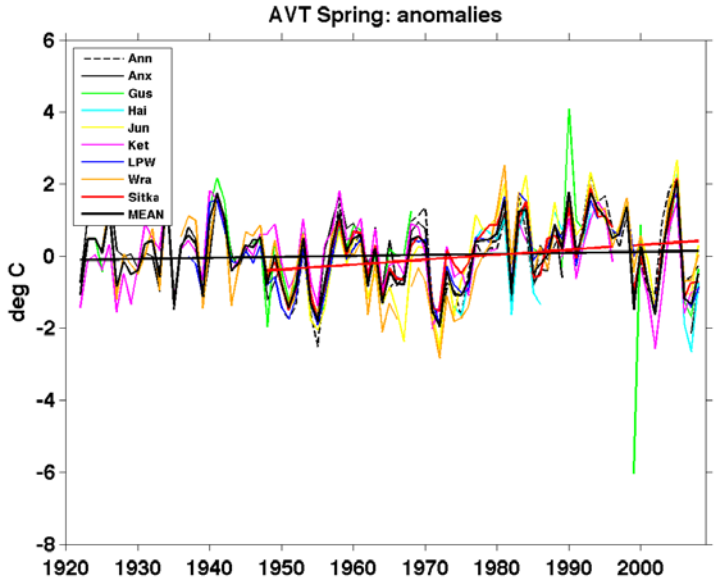
IPCC AR4, 2007

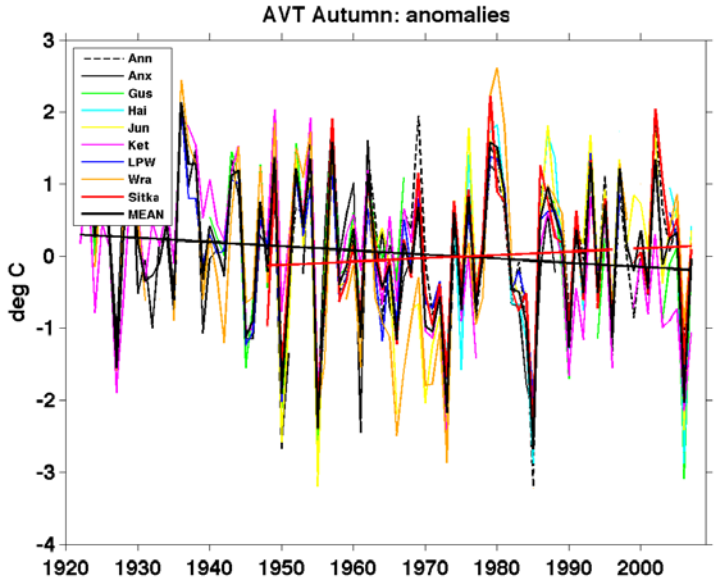
Climate Variability: working on multiple scales

Observed Historical Average Temperature Anomalies by Season for SEAK

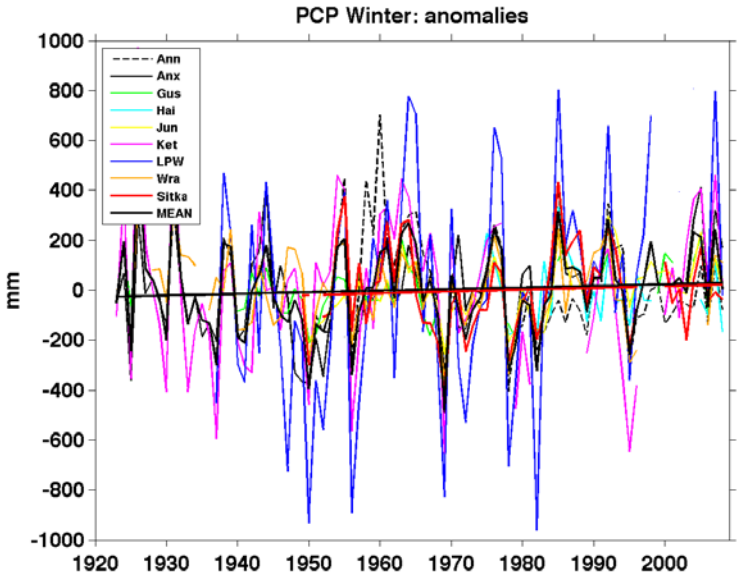


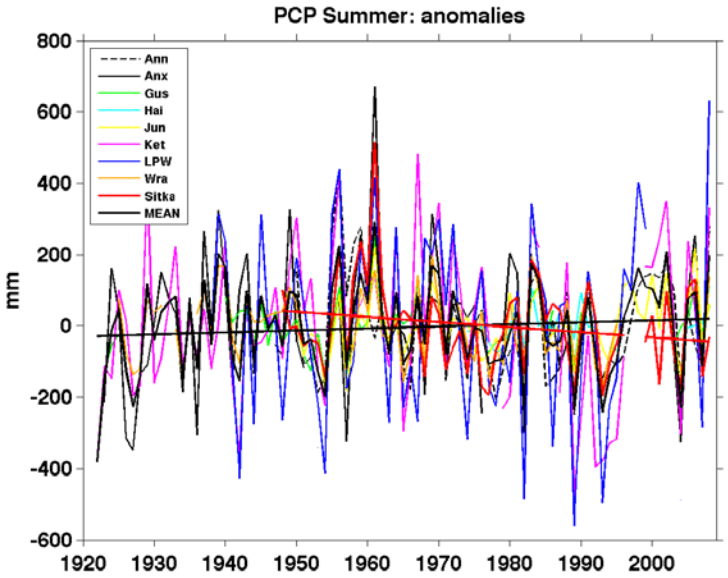


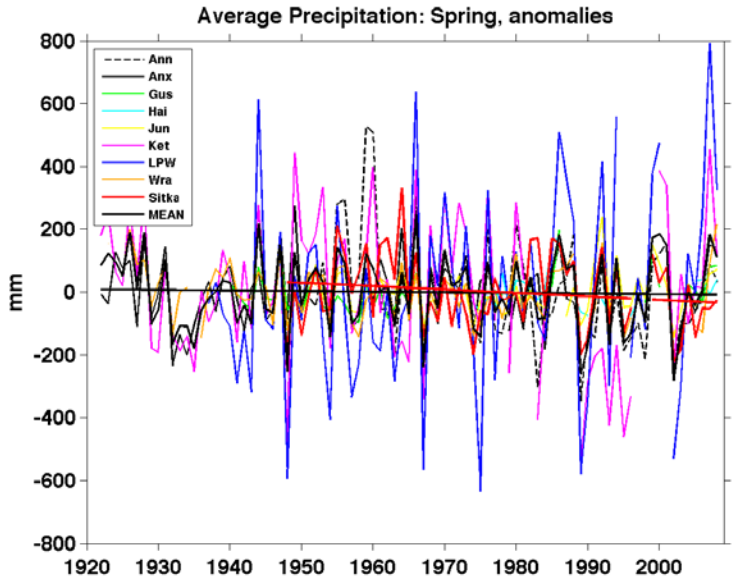


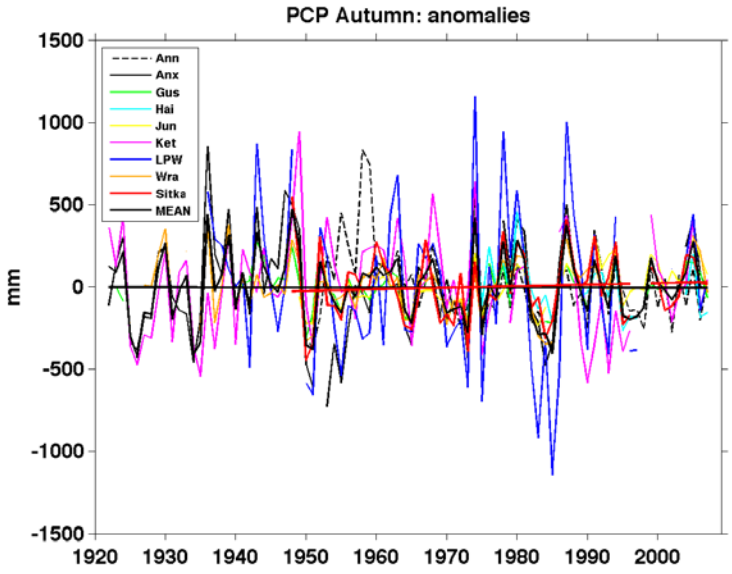


Observed Historical Precipitation Anomalies by Season for SEAK









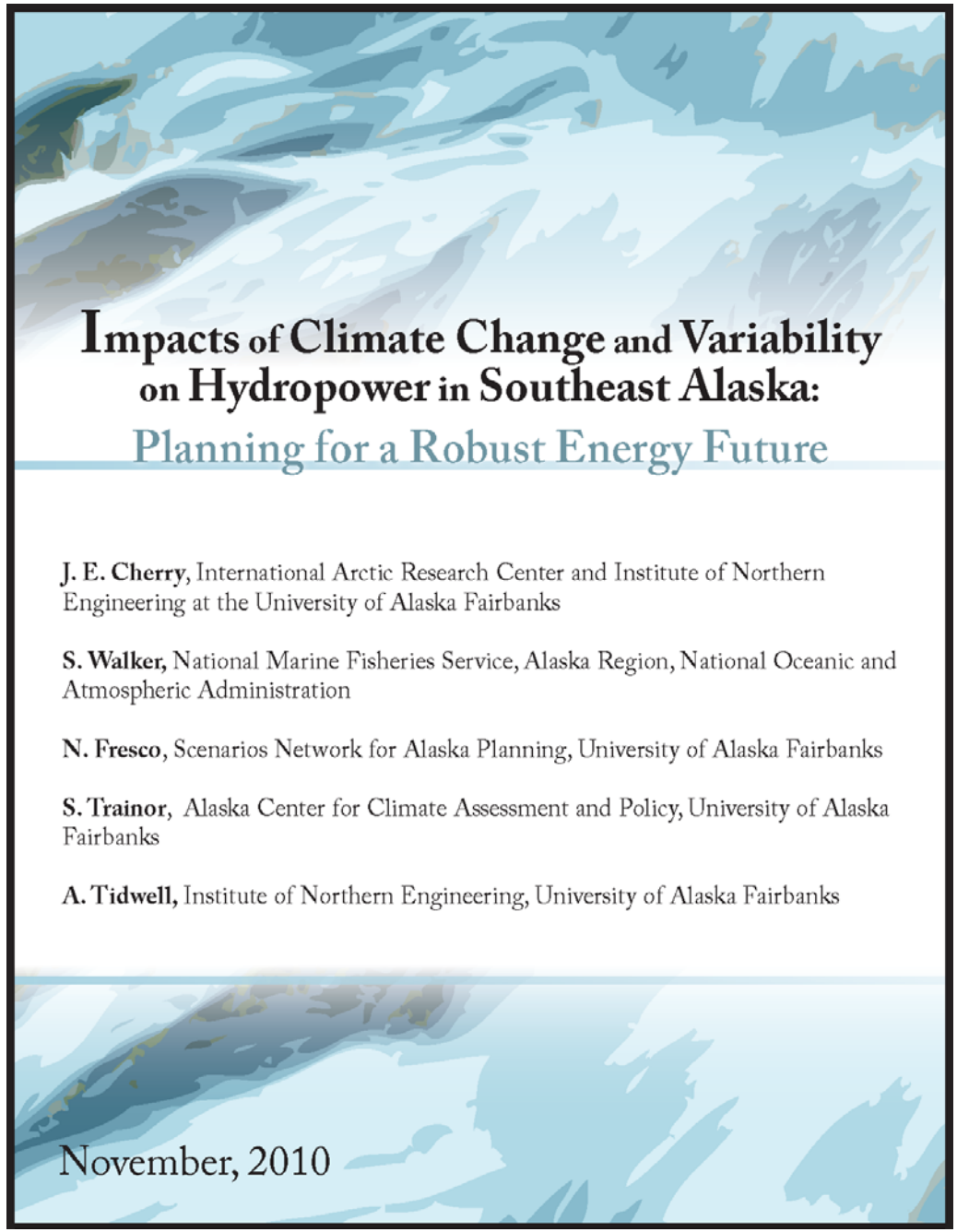
Lessons for Susitna:

Regional Market Integration matters when it comes to the economic impacts of climate variability

Climate mechanisms matter…especially the potential for tipping points such as change in glacier distribution

The tools already exist to improve risk management considerably; need more resource monitoring (snow pack and runoff) and more training in use of forecasting tools on various time scales

http://research.iarc.uaf.edu/~jcherry/SEAK_FINAL/seak_report_final.pdf



Questions?

Contact: jcherry@iarc.uaf.edu

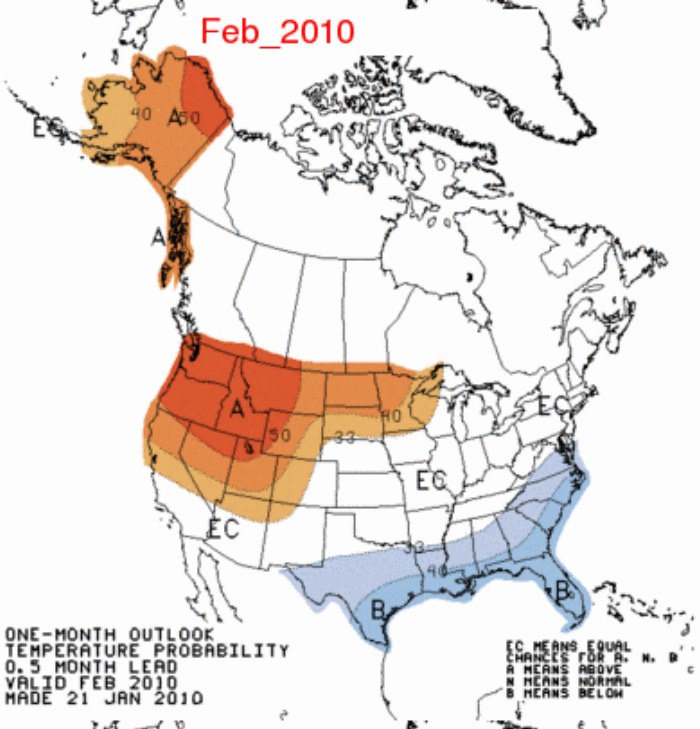
Big economic differences:

Vastly different markets; Norway is a quasi state-run, internationally connected grid, SEAK is largely isolated run by very small municipalities and no obvious external market

Most of SEAK's tiny communities are saddled with high levels of debt service. Not the case in Norway, absorbed by the Federal economy

Norway's hydropower risk is commoditized, SEAK's is not. Maybe the ratepayers lose, regardless

In Norway, monitoring the snowpack is a management tool. SE doesn't use snowpack monitoring.


Feb_2010
ONE-MONTH OUTLOOK
TEMPERATURE PROBABILITY
0.5 MONTH LEAD
VALID FEB 2010
MADE 21 JAN 2010
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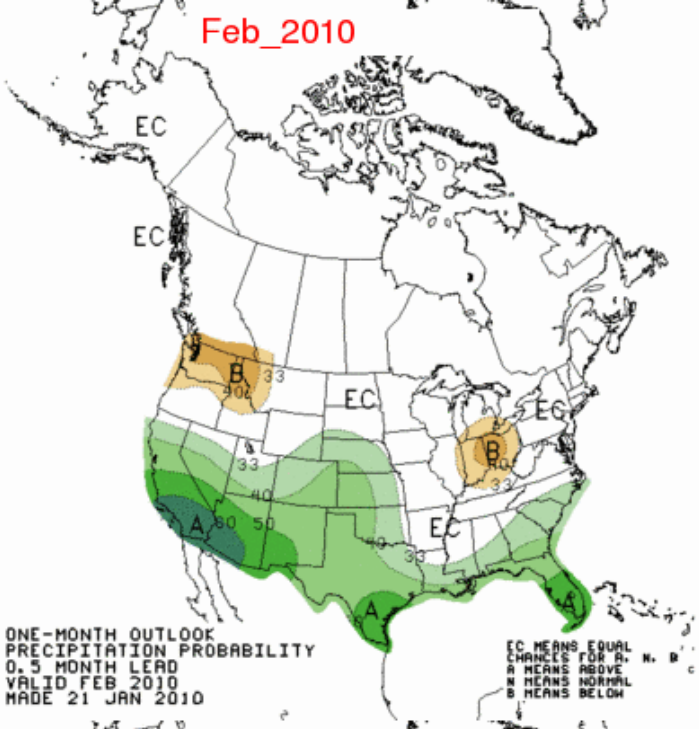
A MEANS ABOVE
N MEANS NORMAL
B MEANS BELOW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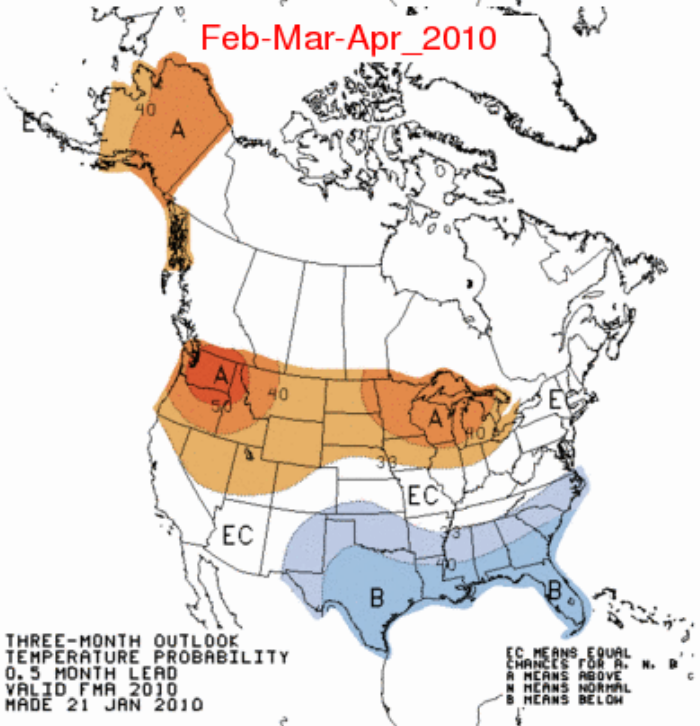
Feb-Mar-Apr_2010
THREE-MONTH OUTLOOK
TEMPERATURE PROBABILITY
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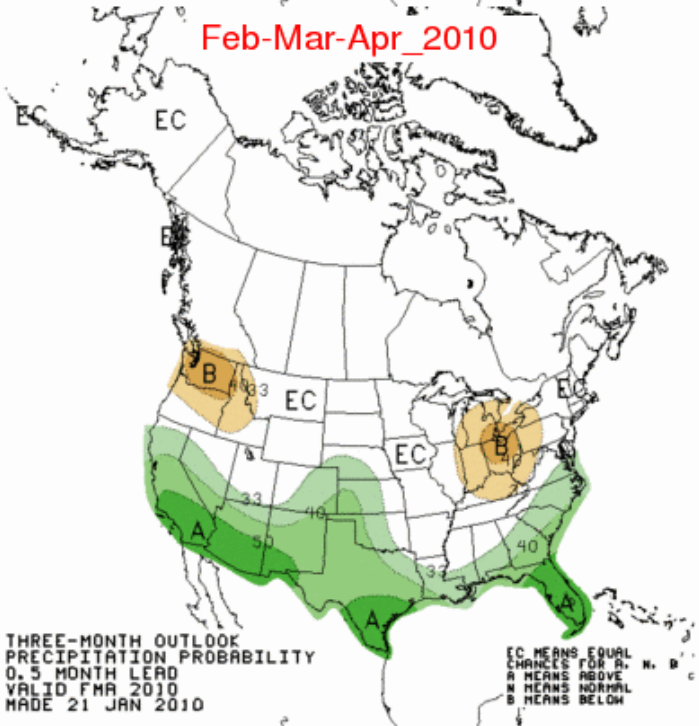
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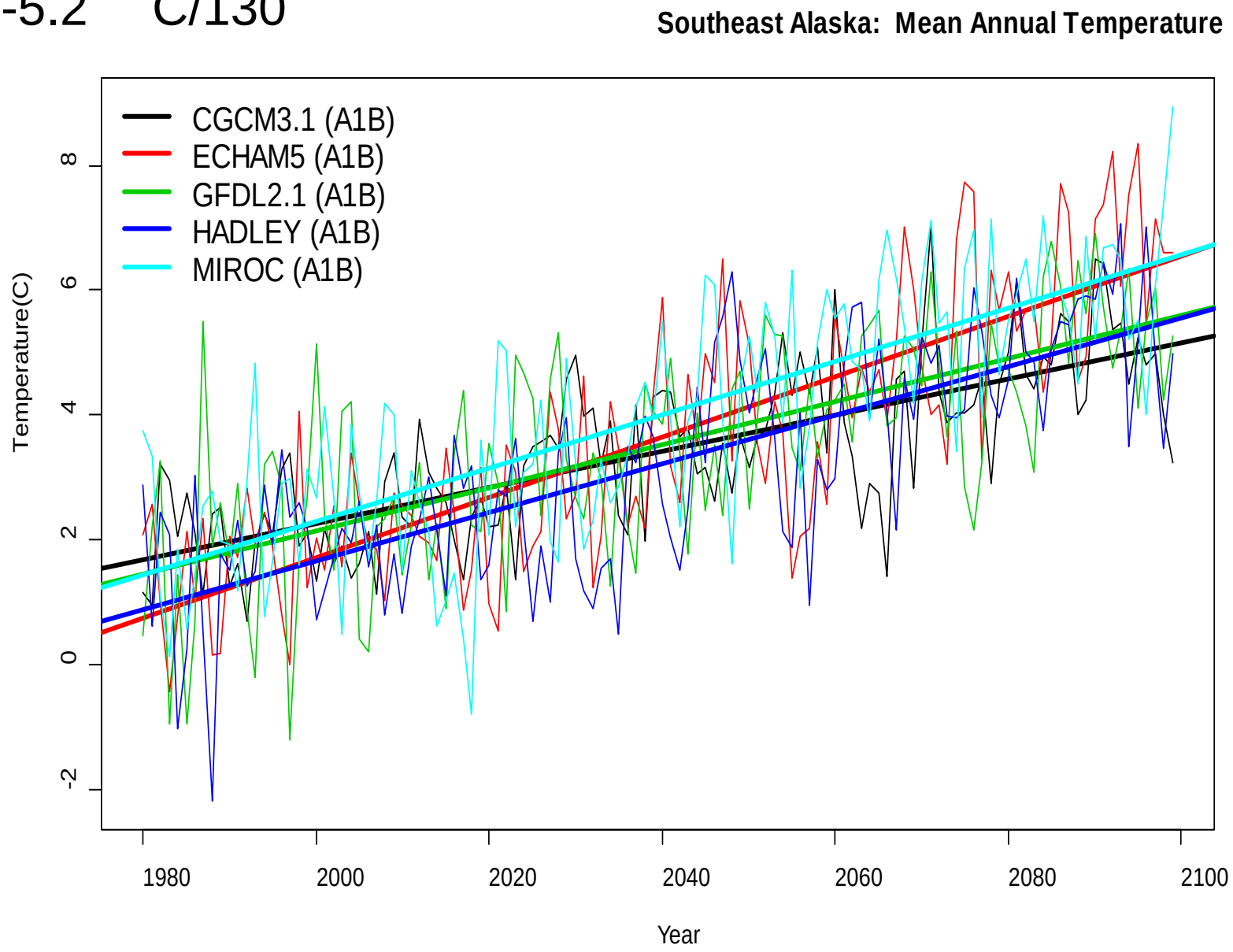
Climate Change

100-year and longer downscaled projections of temperature and precipitation for AK under various scenarios of Greenhouse Gas emissions

Projections of likely changes in soil temperatures, permafrost distributions and impact on groundwater storage

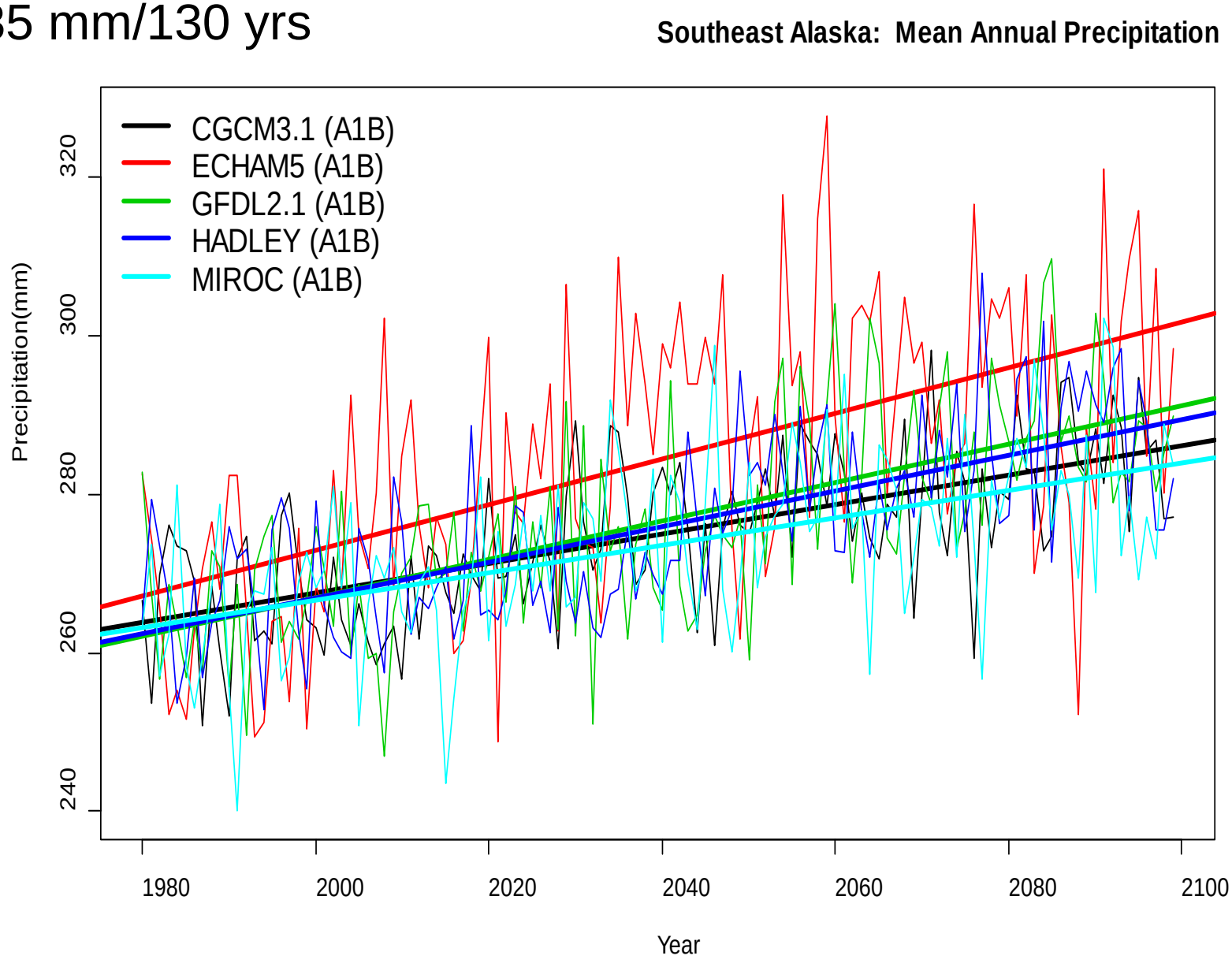
Temp Projections from SNAP for Southeast, AK

3.5-5.2 ° C/130 yrs



Precip Projections from SNAP for Southeast, AK

23-35 mm/130 yrs



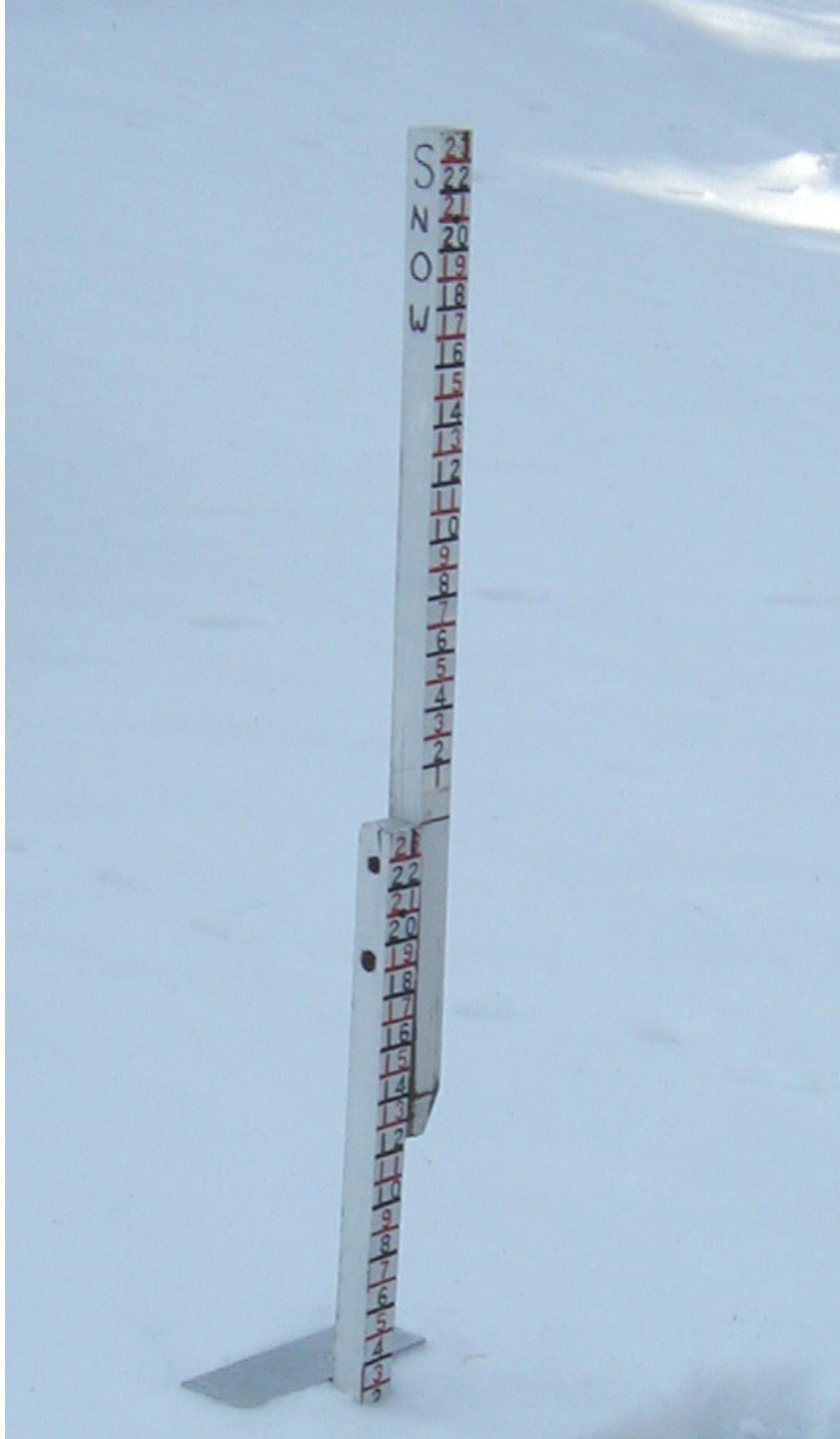
Other things to consider…

Monitoring!!!!!

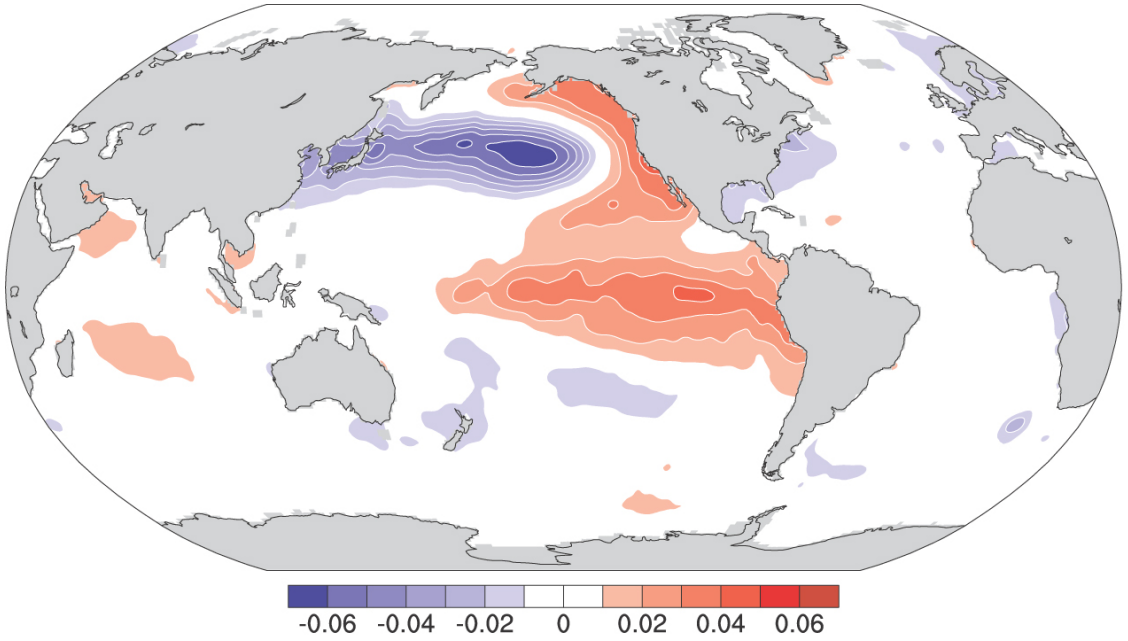
Very little in SEAK, despite importance of hydropower. Compare to Norway

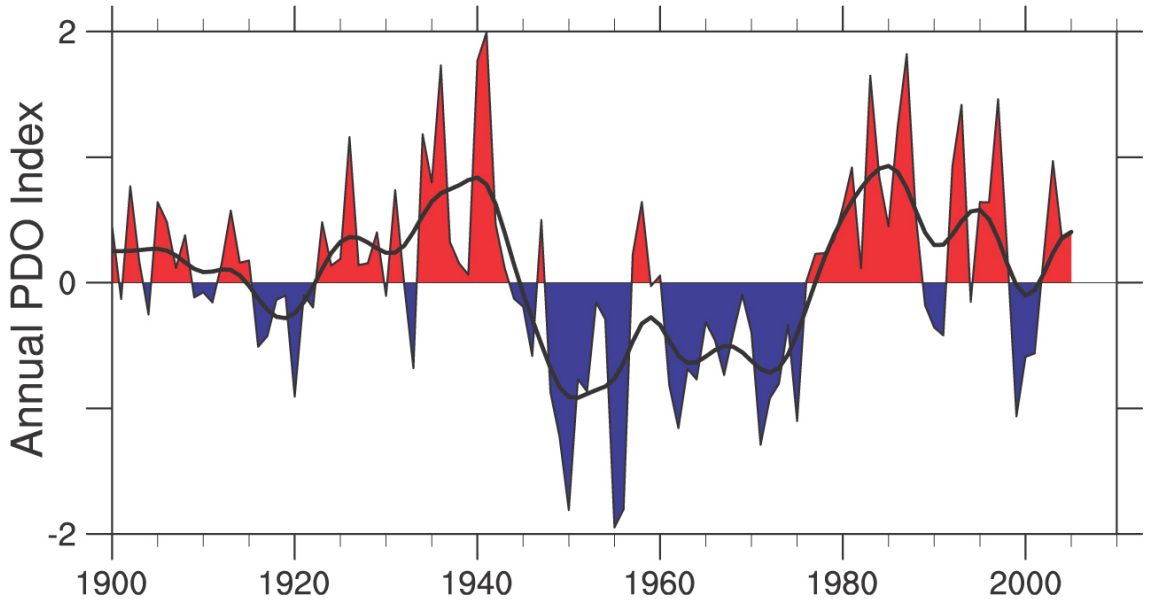
Temperature, Precipitation, Snow depth, ET, discharge, Glacier mass balance & change over time

AEL&P has USDA/NRSC Snotel site. Monitoring need not be costly!



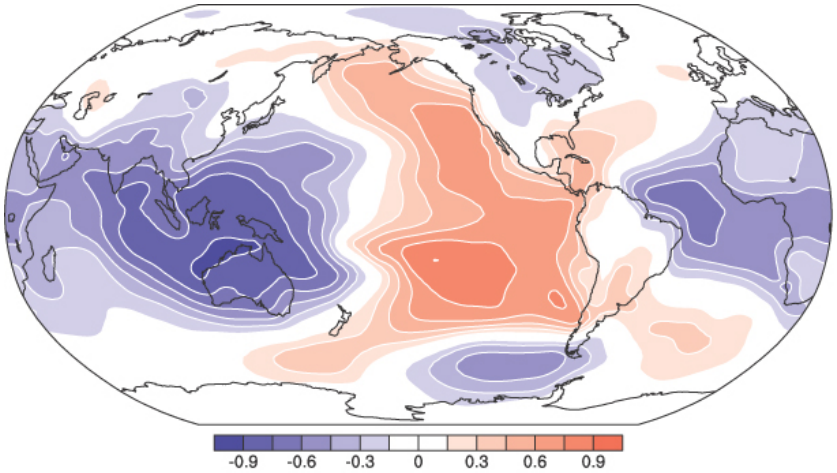
Observed Climate Variability: PDO

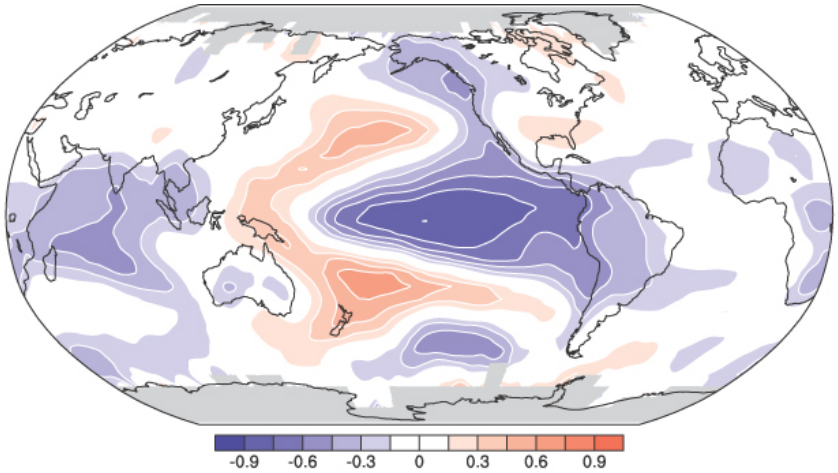


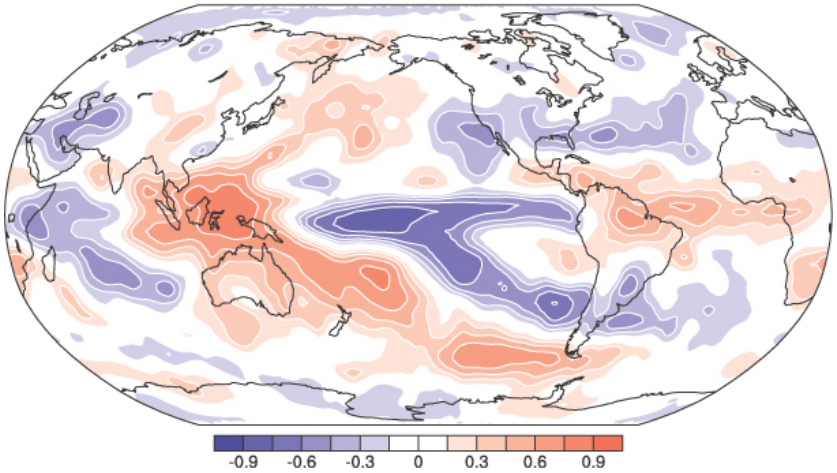


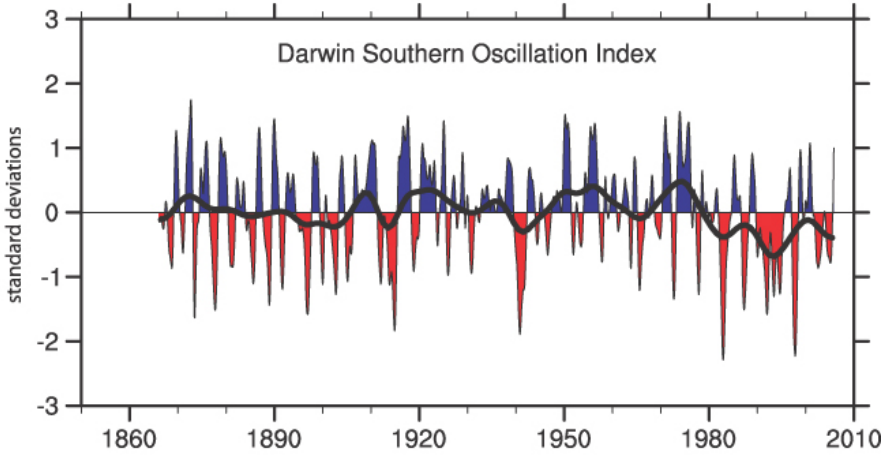
IPCC AR4, 2007

Observed Climate Variability: ENSO



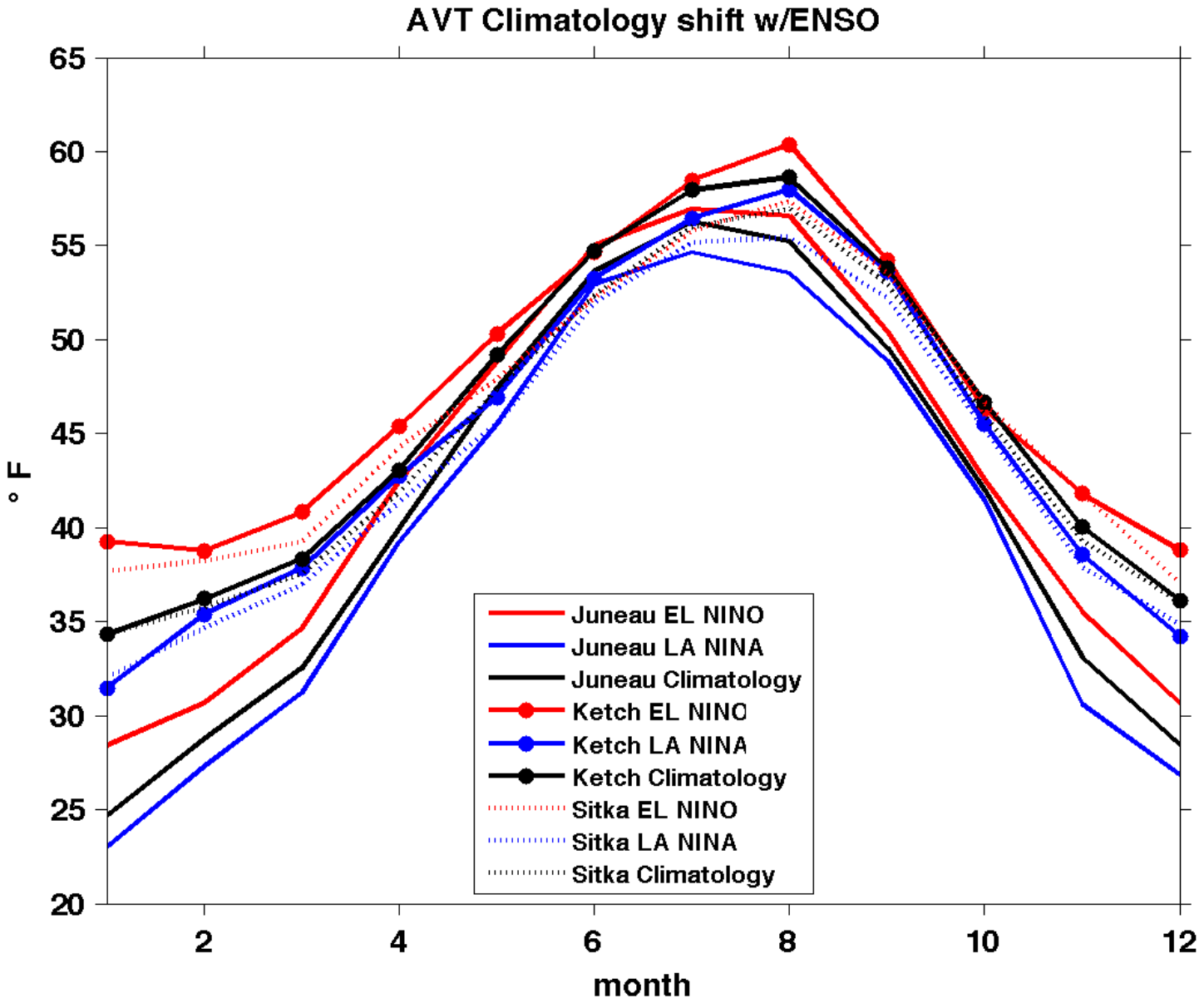






IPCC AR4, 2007

Impact of ENSO at SEAK Stations



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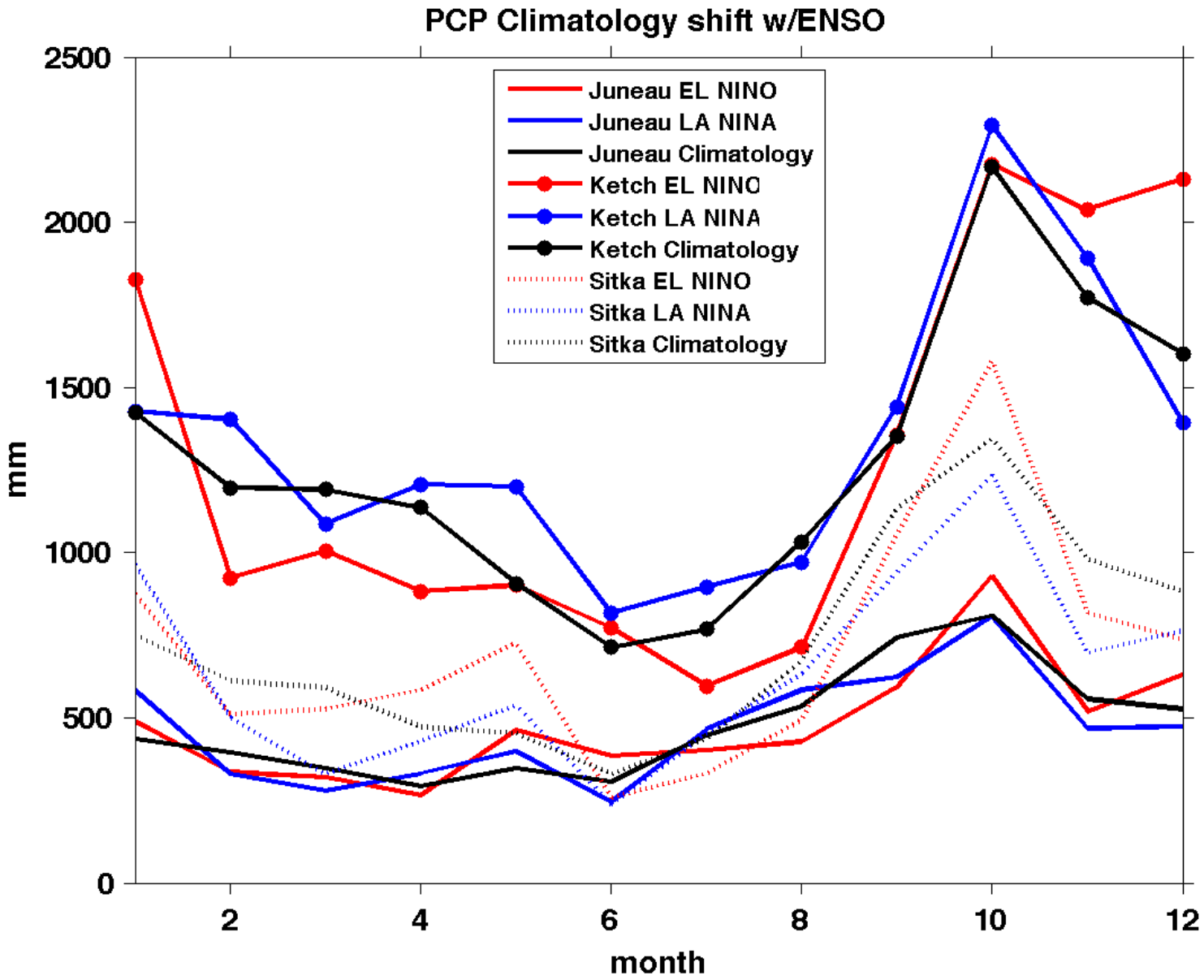
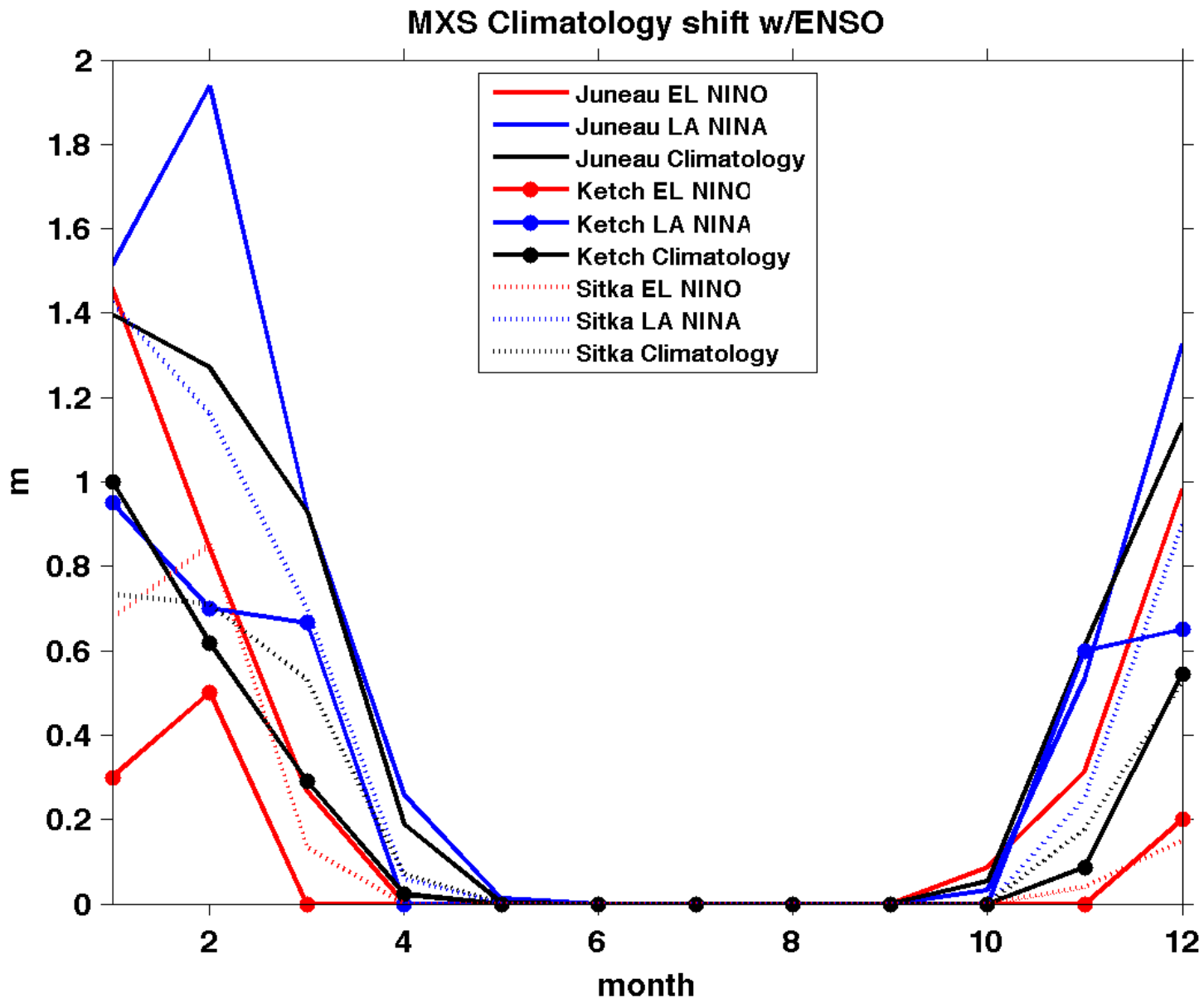


Impact of ENSO at SEAK Stations



Sedimentation's impact on Hydropower

Sedimentation can reduce the size of the reservoir and causes abrasion of turbines and other infrastructure

Erosion and climate are strongly coupled

Erosion may be accelerated by melting of glaciers in the watershed

Bottom line

- Climate Change DOES matter, but our short observational records in Alaska make it difficult to separate climate change from natural multi-decadal variability. (Attribution problem). There are also data quality problems, especially for measurements of precipitation and discharge
- Based on our short record and a small number of studies, about half of the observed climate change in Southeast may be attributable to long-term climate change and about half may be attributable to natural climate variability on decadal and multi-decadal timescales

Bottom Line

- There is high inter-annual variability in climate conditions throughout SEAK. Less than 25% of this is explainable by ENSO or PDO conditions! Other dynamics, i.e. PNA, AO, and random variability are also factors
- However, seasonal prediction is more accurate in SEAK than most parts of the U.S. This is the effect of PDO persistence, steady long-term warming, and variance explained by ENSO, which is typically predictable 6-9 months in advance

Bottom Line: Recommendations

- Expanded/improved observational networks of temperature, precipitation/snow, runoff, and ET, especially at higher altitudes
- Combined with Climate Change Projections and
- Seasonal Prediction
- Will decrease risk in hydroelectric power management and planning for SEAK

Talking Points

- Climate drivers in Alaska and the Arctic and how they impact hydropower
- Long-term climate change versus climate variability on interannual, decadal, and longer timescales
- Predictive tools: useful for management

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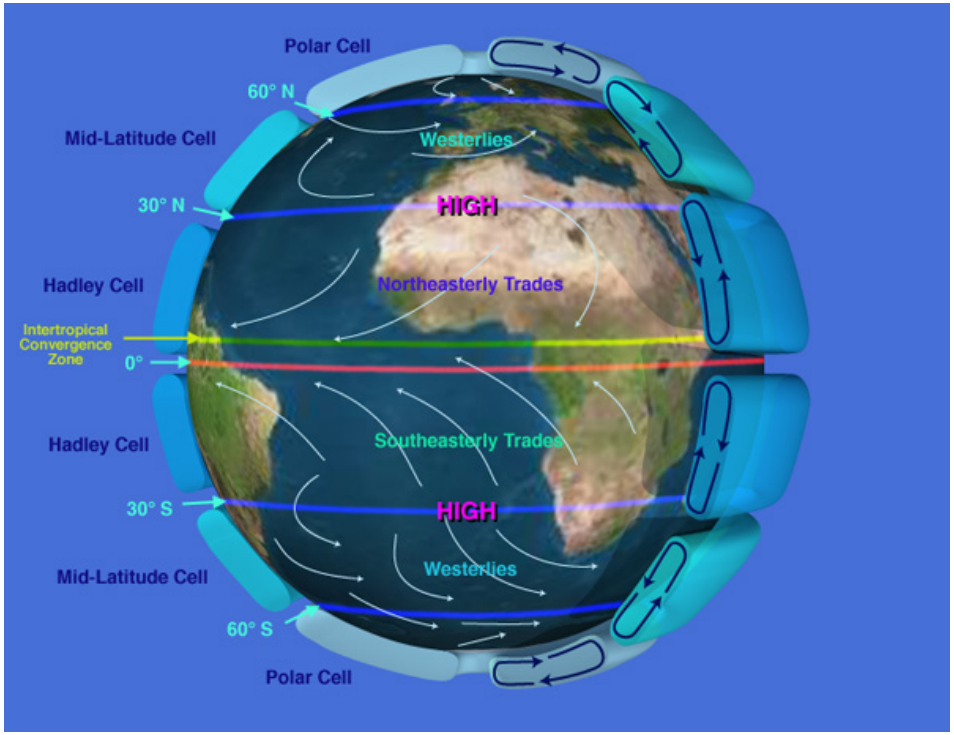
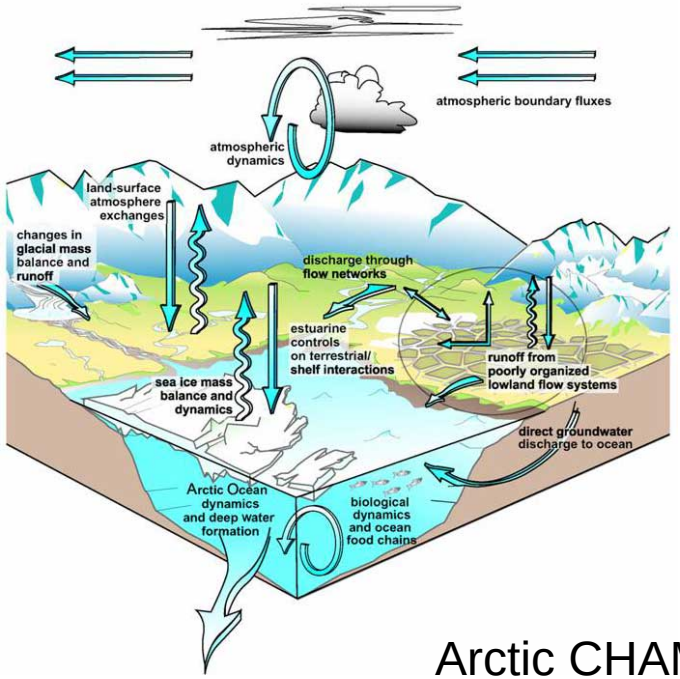
Talking Points

- Climate drivers in Alaska and the Arctic and how they impact hydropower
  - Large scale global ocean atmosphere circulation



Talking Points

- Climate drivers in Alaska and the Arctic and how they impact hydropower
  - Large scale global ocean atmosphere circulation
  - Regional ‘quick’ feedbacks from ice edge, snow cover, Aleutian Low/Siberian High or Icelandic Low/Azores High
  - Regional ‘slow’ feedbacks from glaciers and permafrost (though catastrophic change can occur quickly)



Arctic CHAMP

Talking Points

- Climate drivers in Alaska and the Arctic and how they impact hydropower
- Long-term climate change versus climate variability on interannual, decadal, and longer timescales
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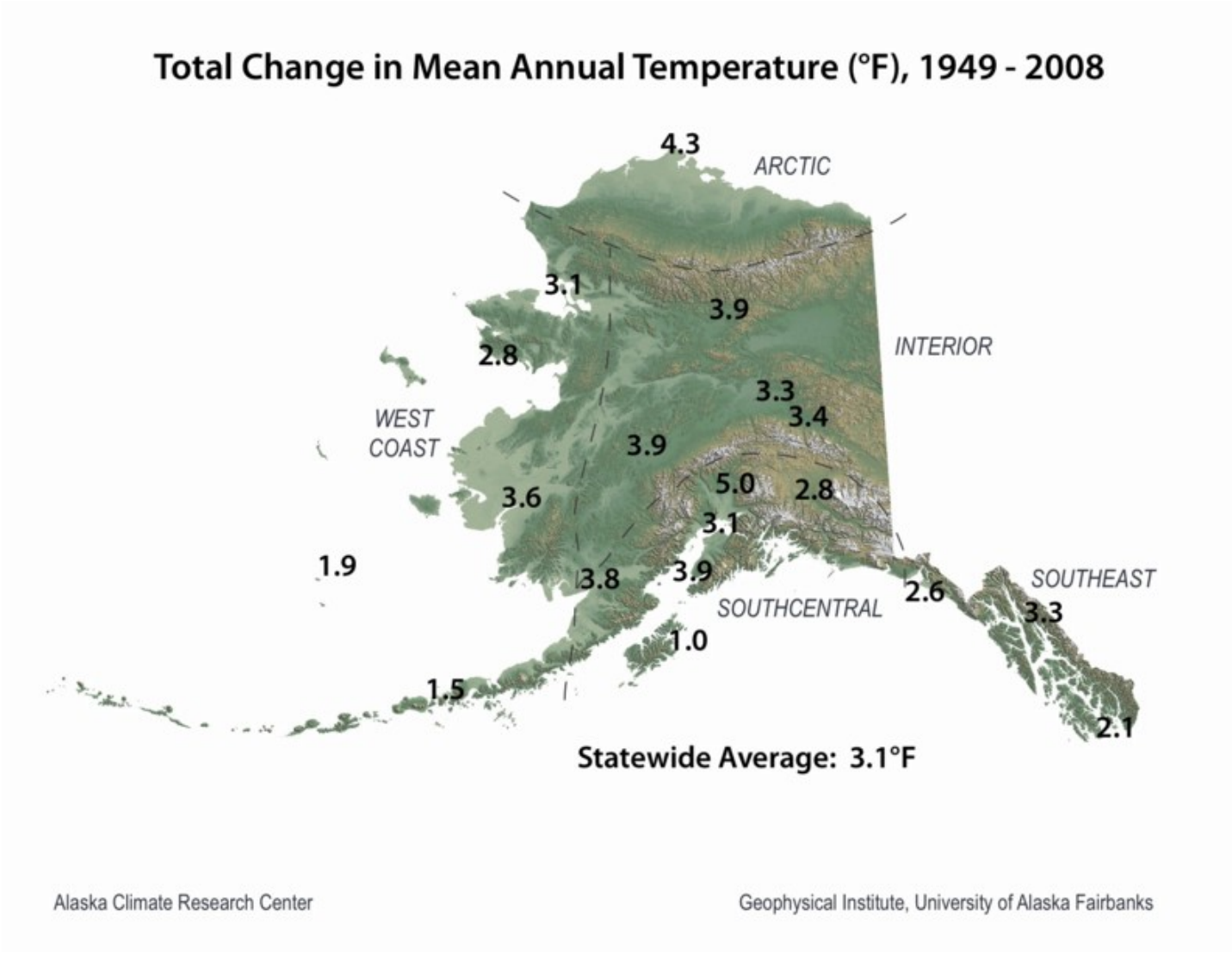
Climate Change

Observed Temperature Change in Alaska



Observed Temperature Change by Season

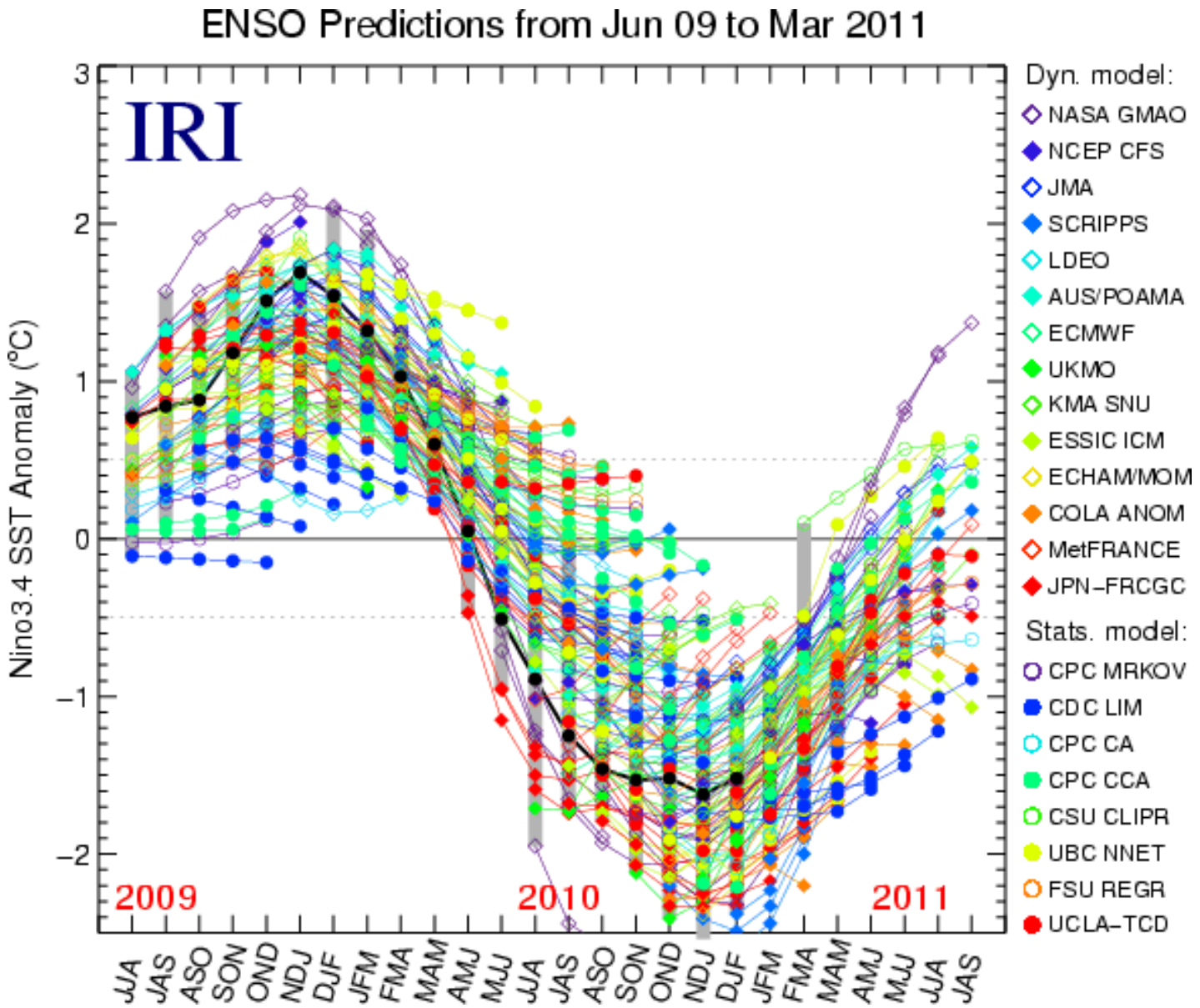
Total Change in Mean Seasonal and Annual Temperature (°F), 1949 - 2008

Region	Location	Winter	Spring	Summer	Autumn	Annual
Arctic	Barrow	6.5	4.4	2.8	3.4	4.3
Interior	Bettles	8.5	4.6	1.8	1.1	3.9
	Big Delta	9.2	3.5	1.2	-0.2	3.4
	Fairbanks	7.7	3.8	2.3	-0.4	3.3
	McGrath	7.4	4.8	2.7	0.6	3.9
West Coast	Kotzebue	6.6	1.8	2.5	1.6	3.1
	Nome	4.4	3.6	2.5	0.6	2.8
	Bethel	6.6	5.0	2.3	0.1	3.6
	King Salmon	8.1	4.7	1.8	0.6	3.8
	Cold Bay	1.5	1.8	1.8	0.9	1.5
	St Paul	1.0	2.4	2.8	1.3	1.9
Southcentral	Anchorage	6.8	3.6	1.6	1.4	3.1
	Talkeetna	8.9	5.4	3.1	2.4	5.0
	Gulkana	8.1	2.4	0.9	0	2.8
	Homer	6.3	4.0	3.4	1.7	3.9
	Kodiak	0.9	2.3	1.2	-0.4	1.0
Southeast	Yakutat	4.9	3.1	1.8	0.3	2.6
	Juneau	6.6	3.1	2.1	1.4	3.3
	Annette	3.9	2.5	1.7	0.2	2.1
	Average	6.0	3.5	2.1	0.9	3.1

Alaska Climate Research Center

Geophysical Institute, University of Alaska Fairbanks

Predictability of ENSO



Climate Variability

Talking Points

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Talking Points

- Predictive tools: useful for management
  - Short term numerical weather prediction
  - Probabilistic seasonal forecasts
  - Longterm climate projections

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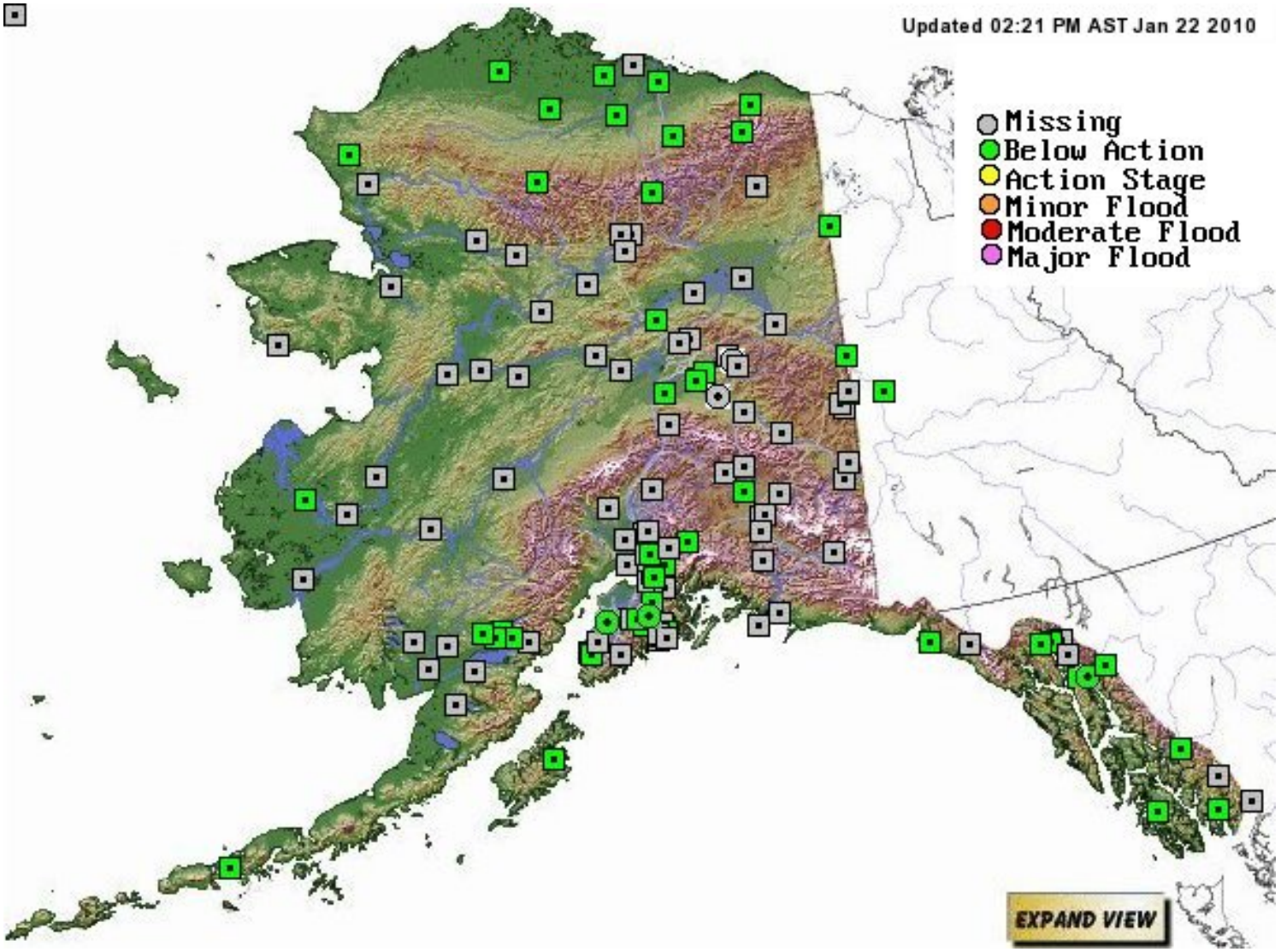
NWS RFC Alaska-Pacific



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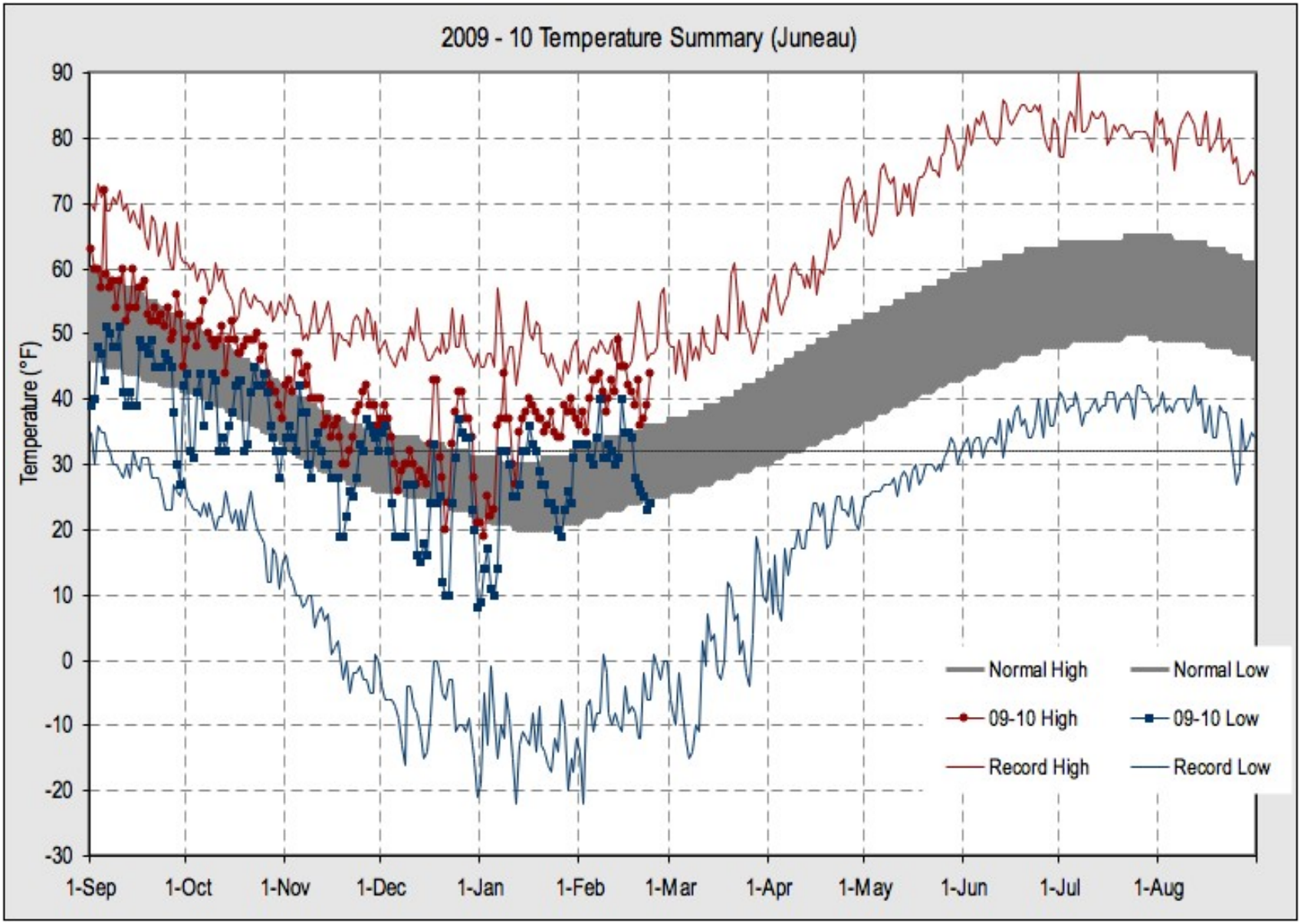
Juneau Climate Anomalies



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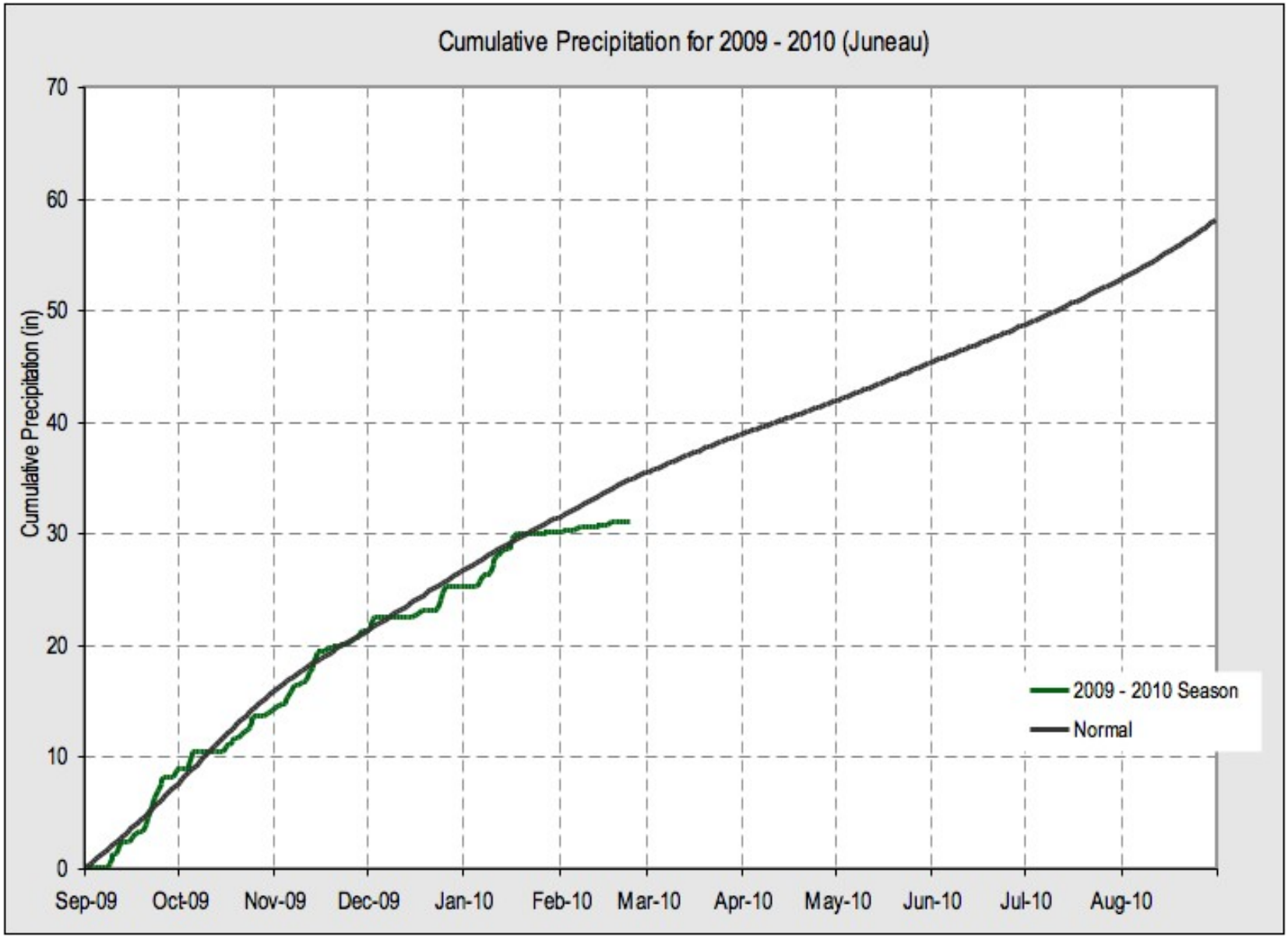
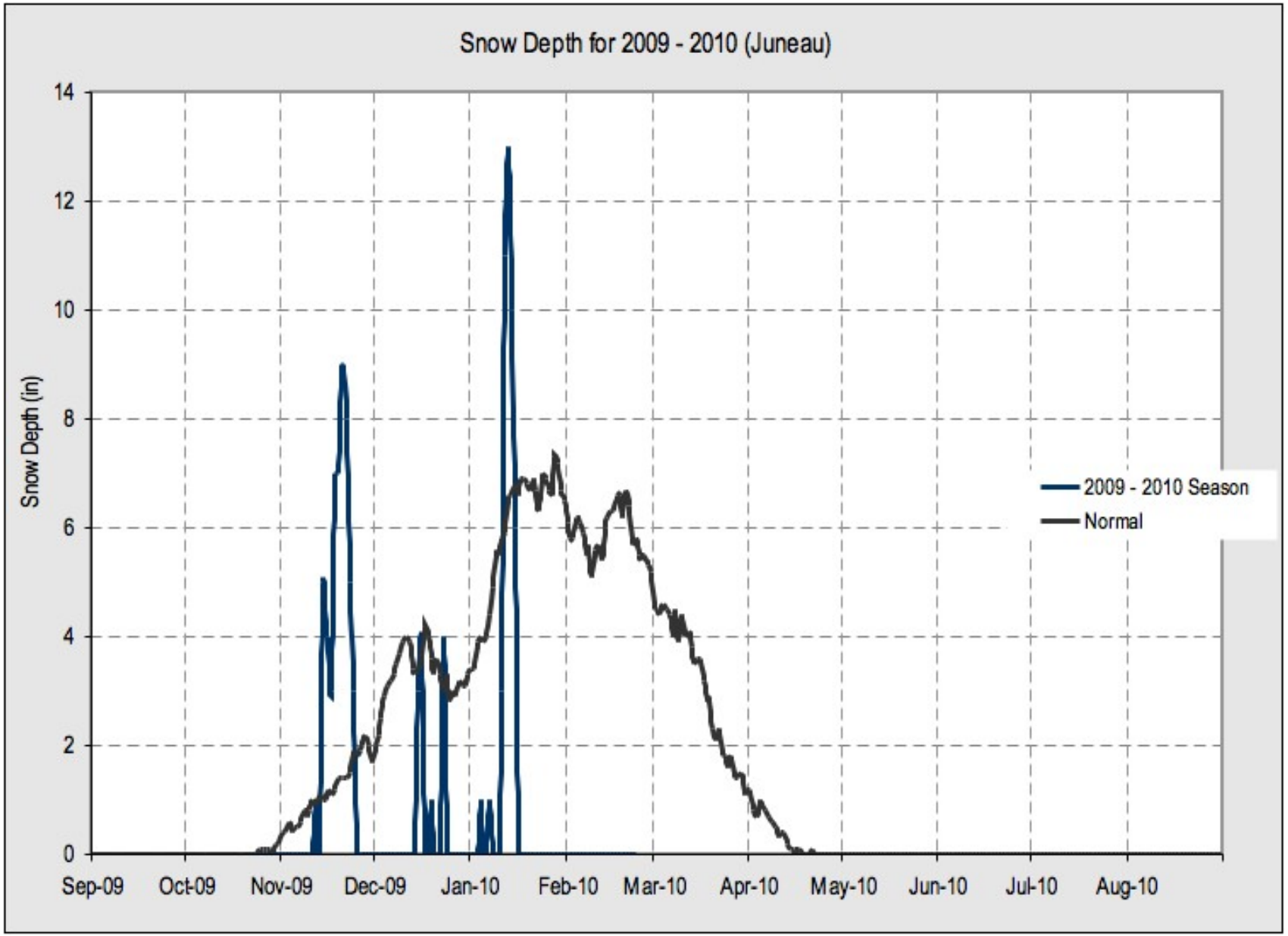


Juneau Climate Anomalies



SE Grid – Existing and Proposed

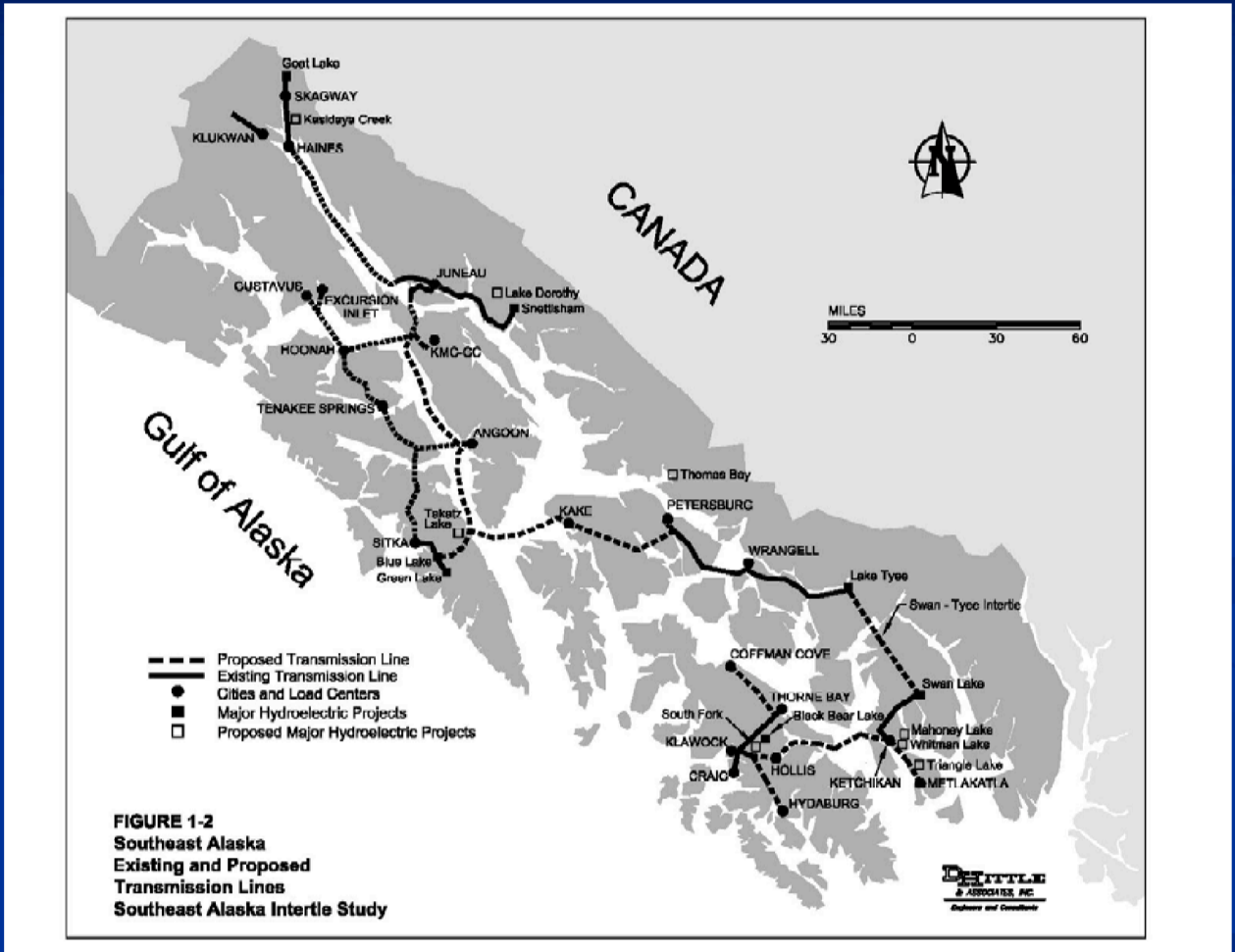


FIGURE 1-2
Southeast Alaska
Existing and Proposed
Transmission Lines
Southeast Alaska Intertie Study

The FOUR DAM POOL Power Agency

Lake Chikuminuk Hydropower Project - Southwest Alaska

National Hydropower Association

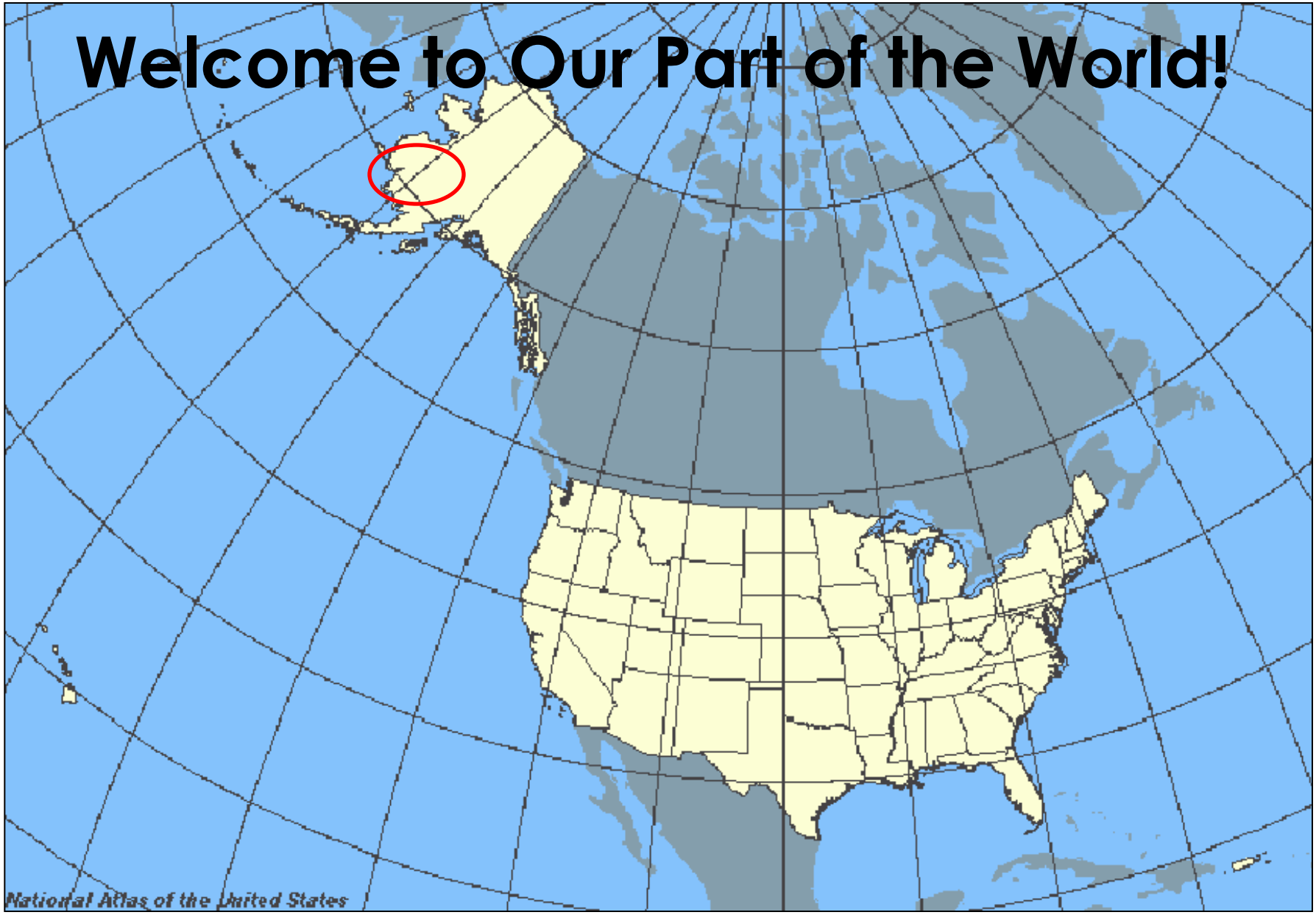
Girdwood, Alaska

August 30, 2011

Nuvista Light & Electric Cooperative

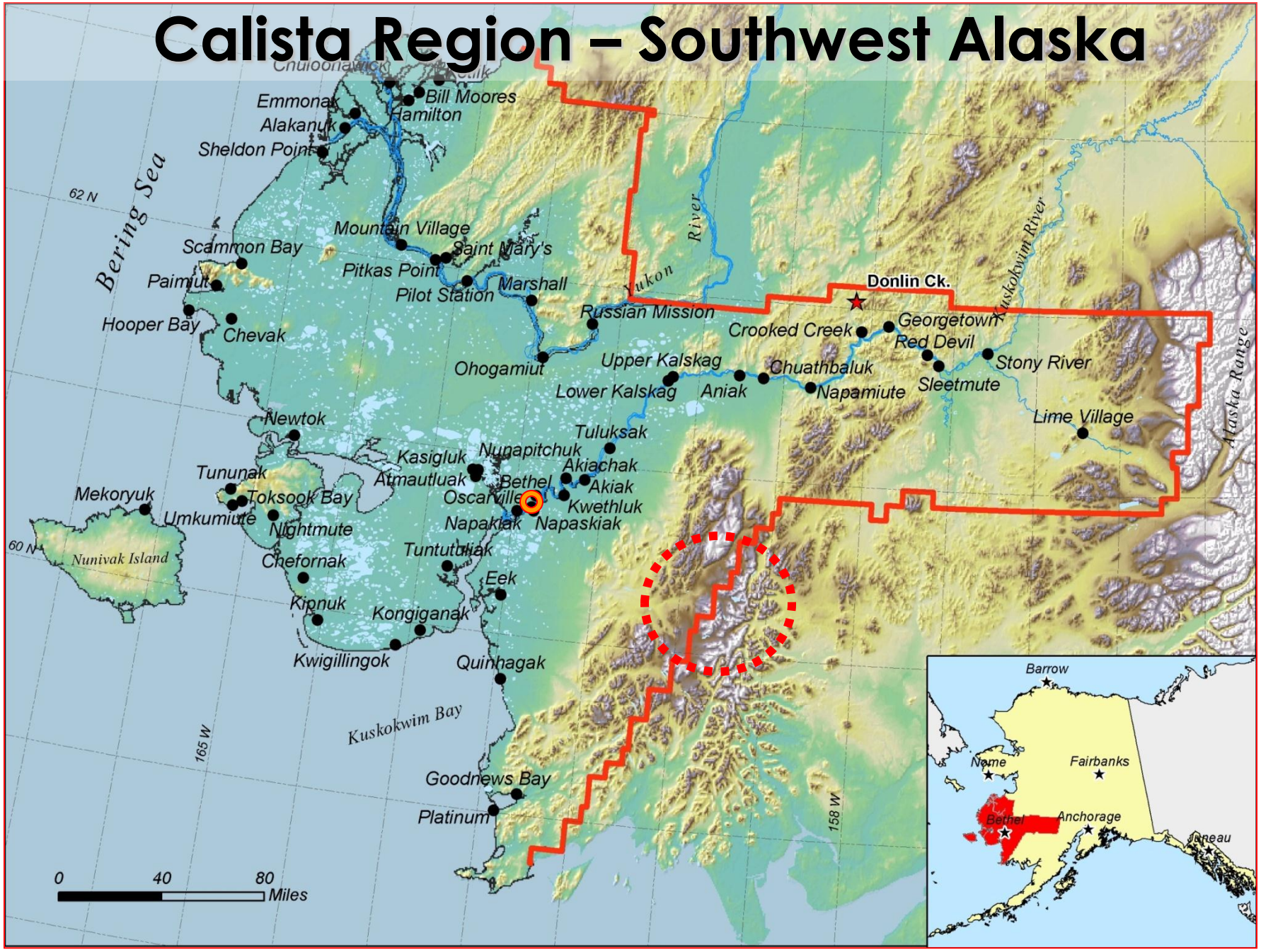
Christine Klein

Welcome to Our Part of the World!

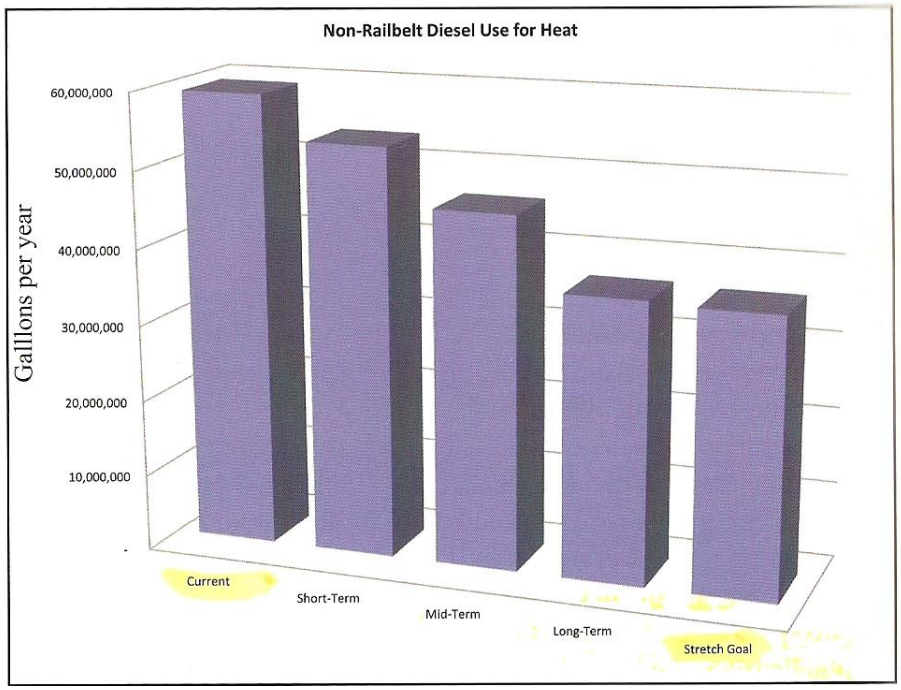


Nuvista Light & Electric Cooperative
"Let's Energize the Calista Region!"

Calista Region – Southwest Alaska



Calista/Yukon Kuskowim Area Energy Situation



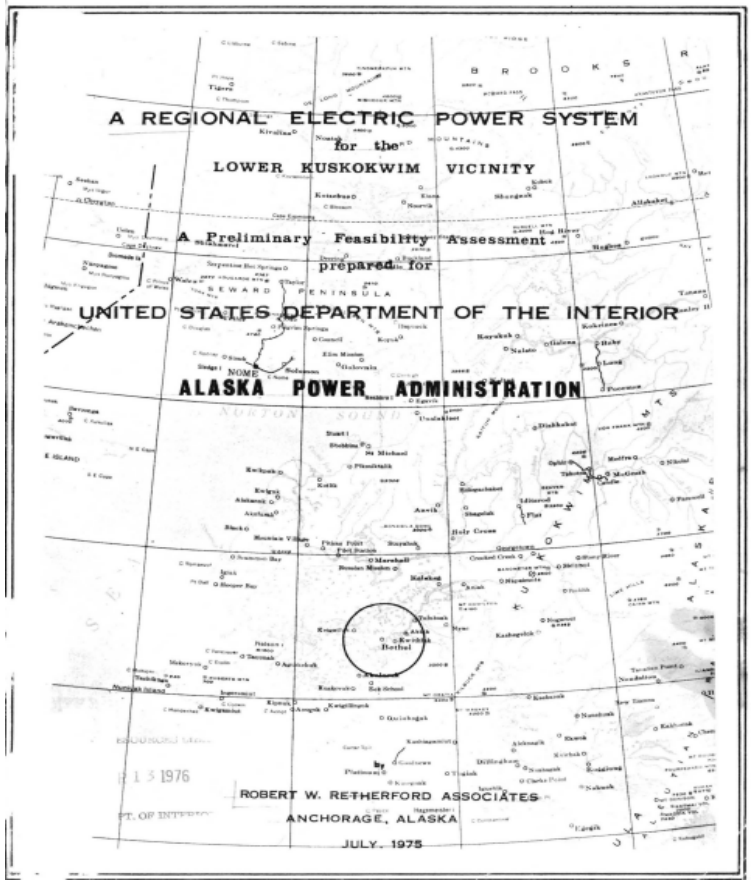
Diesel

- Primary home heating ranged $6.14 to $9.50/gallon in 2010 (barged in yearly)
- 50% of family income goes to heating, now grown to 65 to 75% income
- Families use <50% Natl average energy

Electricity

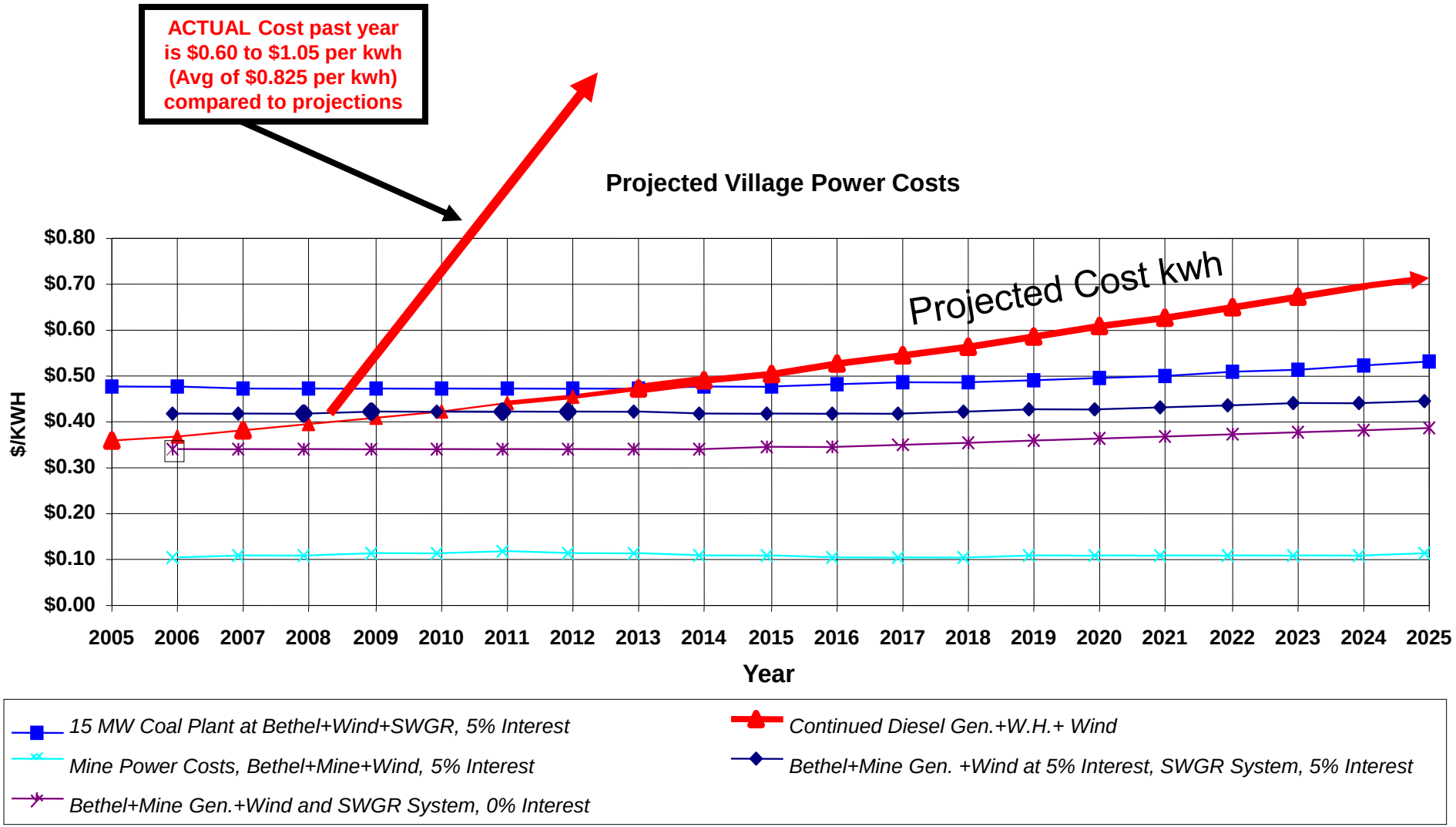
- Many small village diesel generators
- Home use is less than 50% Natl Average
- Cost = $0.58 to $1.05 kilowatt hour 2010
- Escalating cost of energy
- PCE cannot keep up

Where We've Been



- **Over 38** Energy Studies, Data, and Reports since '75.
- > 41 largely independent aged diesel power generator plants
- Village generators use >20 million gallons of diesel year
- Transmission lines needed
- 65Gwh electrical energy need for Bethel +13 villages by 2020
- Coal and Hydropower listed repeatedly as feasible options
- Energy costs escalating

Electrical Cost Projections in 2002



Nuvista Light & Electric Cooperative
"Energize the Calista Region"

Found Energy Needs Varied

Region Villages Vary:

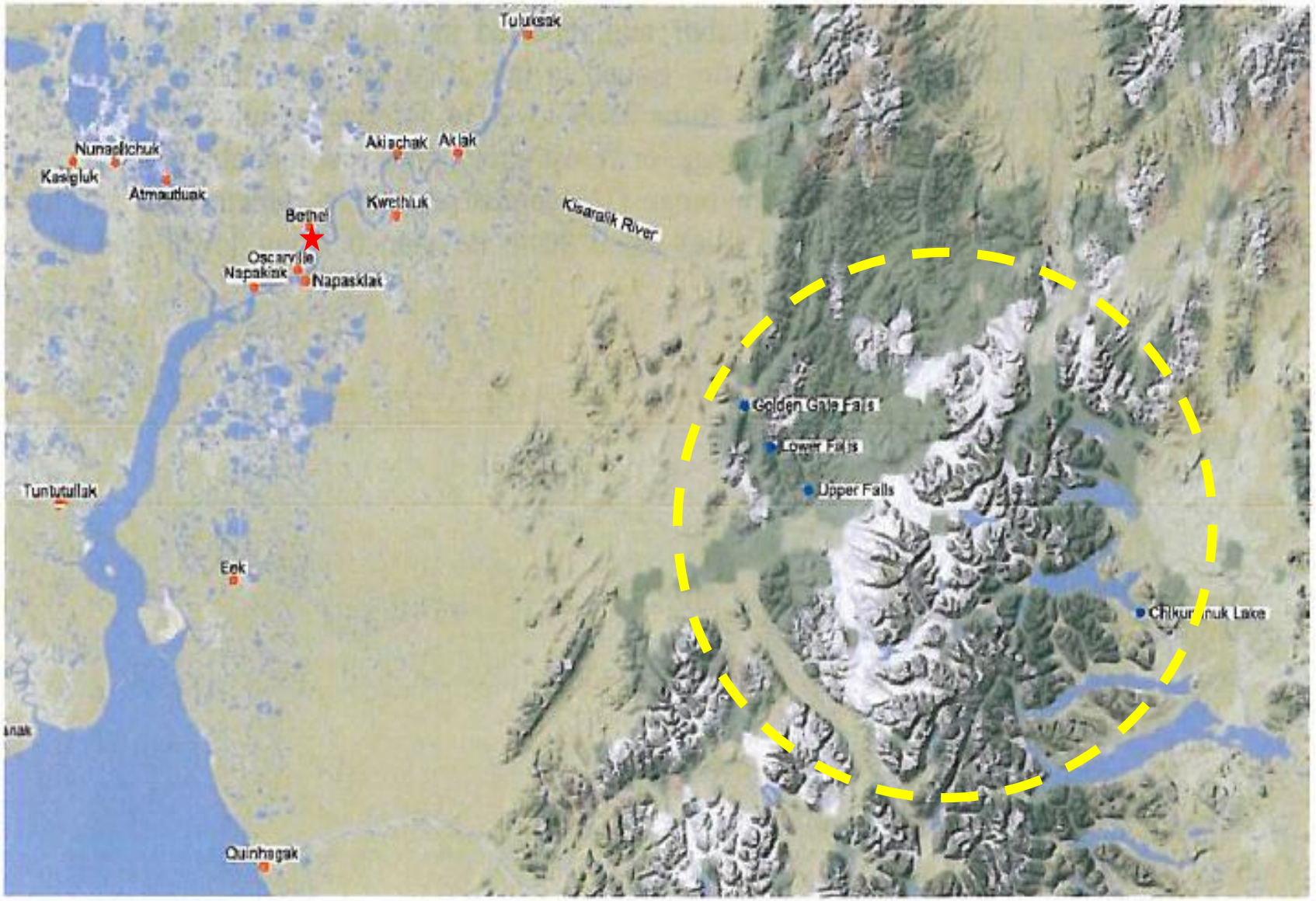
- Diverse Village options
- Conservation Underway but not the complete solutions
- Some Coastal Villages proceed w/wind generation but there's limited application in region
- Some villages have small needs
- ***One size doesn't fit all!***
- Sub-region of Bethel +13 villages will have 65Gwh electrical energy need by year 2020


Hooper Bay

Previous Alternatives Considered

Alt. Energy Type	*Cost to Construct*	*Cost to Operate*	*Use Cost per Kw*	*Capacity to Demand 65kw*	*Public Perception*	*Likelihood or Feasibility*
Diesel	Existing	High	High	Same	-	Existing
Geothermal	High	Low	-	None	Positive	Small
Wind Power	Medium	High	Low	Low	**Positive**	**Limited**
Hydropower	High	**Low**	**Medium**	**High**	**Positive**	**High**
Coal Power Plant	High	Medium	Low	**High**	**Negative**	**Medium to Low**
Nuclear Power	Low	Low	Low	High	**Very Negative**	**Poor to None**

Remaining Hydropower Sites



Preliminary Findings - 2010

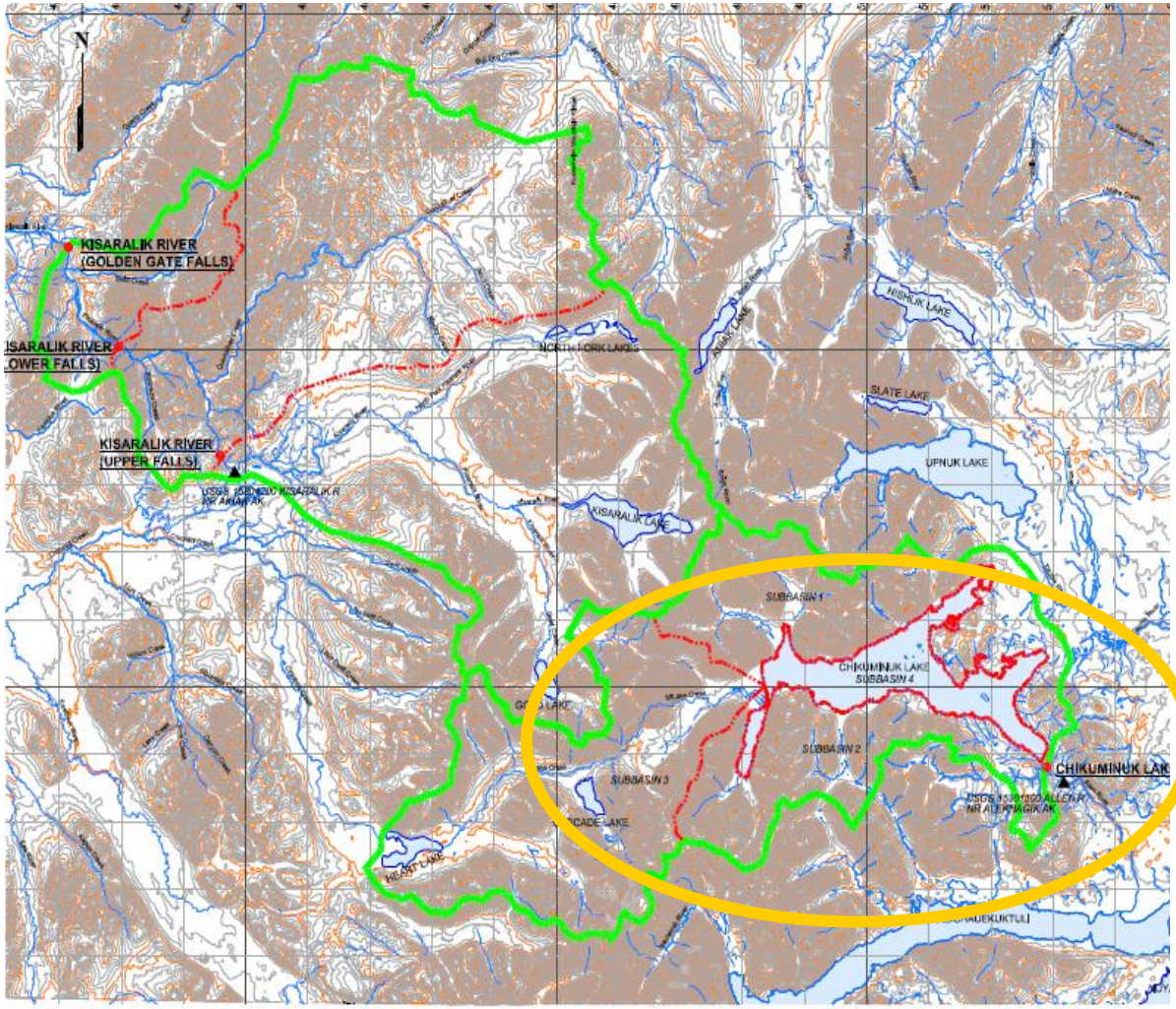
Potential Hydropower Site	*Distance from Bethel (miles)*	*Head ft*	*Generating Capacity (MW)*	*Year Around, or Seasonal Energy Production*	*Useable Hydro Energy GWh*	*Feasible*
Chikuminuk Lake Allen River Outfall	118	91	13.4	**Y**	**65+**	**Yes**
Kisaralik River Upper Falls	70	149	27.7	S	39.7	Yes
Kisaralik River Lower Falls	62	122	34.1	S	46.9	Yes
Kisaralik River Golden Gate	57	78	27.0	S	38.8	Yes

Preferred Alternative

Site	*Construction Cost w Transmission in 2010 dollars*	*Design Cost*	*Total Project Cost*	*Estimated 20 year Cost/Kwh*	*Meets Bethel Sub-Region 2020+ Demand?*
Chikuminuk Lake Outfall	**$391.7 M**	**$91.3 M**	**$483 M**	**$0.70-0.58**	**Yes**
Kisaralik River Upper Falls	$386.4 M	$92.6 M	$479 M	$0.70-0.65	No
Kisaralik River Lower Falls	$329.5 M	$78.5 M	$408 M	$0.70-0.65	No
Kisaralik River Golden Gate	$305.5 M	$72.5 M	$378 M	$0.70-0.65	No

Current and Next Steps

- ✓ Hydro Recon and Feasibility Done
- ✓ Nuvista Decision to Proceed – New CEO
- ✓ Install Stream Gages
- • Hire Manager to lead and oversee project
- • Start FERC Licensing, and Environmental
- • ROW and Designs
- • Public process
- • Parks & Permitting
- • Final Engineering
- • Construction 2019-23
- • Potential Operational Goal of 2023



Nuvista Light & Electric Cooperative
"Energize the Calista Region"

Roadless Area Conservation Rule

Regulatory Challenges in the Heart of the Tongass

Sitka, Alaska

What is the Roadless Rule?

- The Department of Agriculture adopted this final rule to establish prohibitions on road construction, road reconstruction, and timber harvesting in inventoried roadless areas on National Forest System lands. The intent of this final rule is to provide lasting protection for inventoried roadless areas within the National Forest System in the context of multiple-use management.

36 CFR Part 294 – Jan 2001

Consequences

- Sitka is presently engaged in 2 FERC projects
  - Blue Lake Expansion No. 2230 – Construction in 2012
  - Takatz Lake No. 13234 - Feasibility Level
- 6/24/10 FERC ltr directing meeting between USFS & CBS – resolve Takatz land use issues -120 days
- CBS response on 10/21/11 – sure we will work on solving at this point what is almost 10 years of litigation – by the way, Blue Lake is impacted as well

Blue Lake

Takatz Lake

The Process

- 9/27/10 – CBS requests USDA Secretary make roadless rule determination for Blue Lake
- 3/2/11 – CBS meets with USDA in DC
- 3/7/11 – FERC ltr stating resolution of the RR issue is important to processing of Blue Lake license application
- 3/22/11 – Sec. Vilsack signs decision memo

How Did This Happen?

- Project is well defined
- Involve local folks
- Market the project
- Keep a steady course
- Directly address the boss

CLEARLY DEFINE THE PROJECT

- Ensure the facts are facts – build trust
- Show why you need it
- Evaluate alternatives

LOCAL RESOURCES

- Know local agency reps
- Local knowledge is critical
- Build community ownership of project

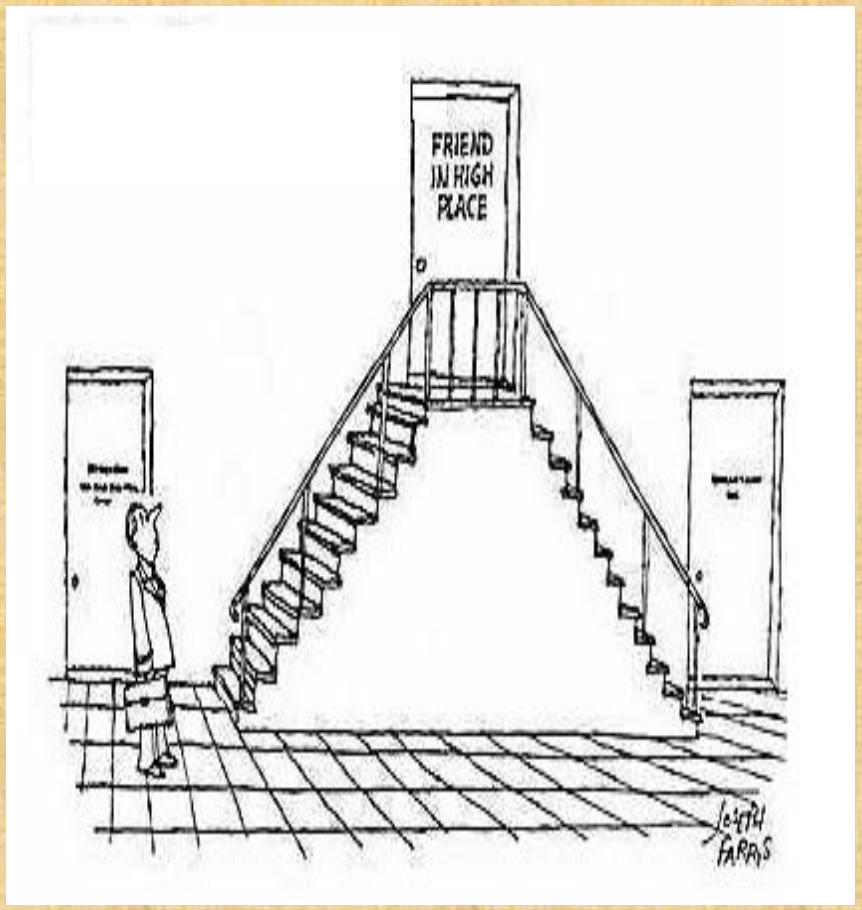
ADVOCATE FROM UNEXPECTED PLACES

- State Government
- Chamber of Commerce
- Economic Development Associations
- Environmental Groups
- Utilize Media – *Rain Power*
- Public meetings
- Job creation & training – Local Employment Office
- Trade groups
- Publications
- Websites
- Schools

CONSISTENTENCY

- Be firmly on both sides of the fence
- Keep focus on community needs
- Set realistic goals but keep the pressure on

ENGAGE THE DECISION MAKERS



- **Get them on site!**
- Promote the positives
- Understand what's good for them/what's bad for them
- Meet key staff
- Keep them informed

CHALLENGES

- There will be opposition
- Don’t kill mosquitoes with hand grenades
- Be flexible (as long as you don’t change anything….important)

A REGULATORY TSUNAMI* IS COMING

- Regulatory agency budgets have grown 16% since 2008
- 75 new major rules imposed in last 26 months
- July alone saw 379 new rules implemented
- Federal Register notes there are >4,200 regulations in the pipeline

*John Merline, Aug 15,2011, Investors Business Daily

PARTNERSHIP

"You give me half the fish, and I tell my Mom to let you live."

Questions?

NHA CONFERENCE

Girdwood, Alaska
August 30-31, 2011

Eric Wolfe, Director of Special Projects
Dave Carlson, CEO

Who is SEAPA?
(Southeast Alaska Power Agency)

- We own the Tyee and Swan Lake hydroprojects and provide wholesale power to the utilities in Ketchikan, Wrangell and Petersburg,
- Also own the transmission lines linking those communities together – around 175 miles including 14 miles of submarine cable
- Hydro Projects were built by the State in the early 1980's
- Non-Profit, Non PCE, and our rates have not changed since 1990

What is the Bradley Lake Model?

Bradley Lake

- 50% bond financing
- 50% ‘deferred’ State grant or a 50% deferred loan
- Amortization spread over 50 years-coincide with FERC License?
- Probably the method proposed for Susitna Project financing?

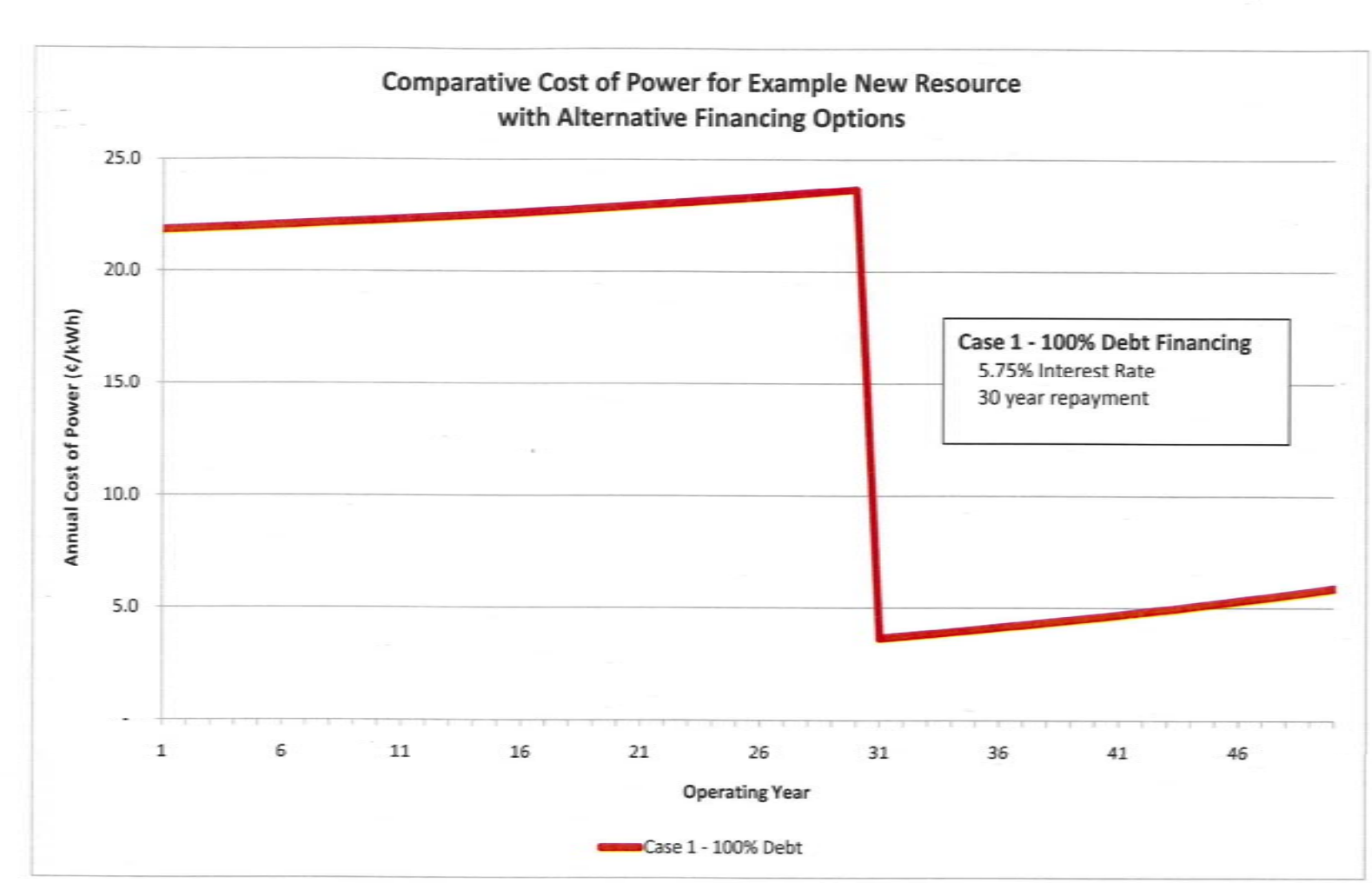
Apply Bradley Lake Model to a hypothetical $140M Project

Cost: $140 million
Annual Energy: 50,000 MWh

We will examine the cost of power using 4 different financing models

- Case #1: Conventional Financing – 30 years
- Case #2: 50% Bonds - 30 years and 50% Deferred State Grant – 30 years (pay back principal only)
- Case #3: 50% Bonds - 30 years and 50% State loan – 30 years (no deferred interest)
- Case #4: 50% Debt - 30 years and 50% State Grant

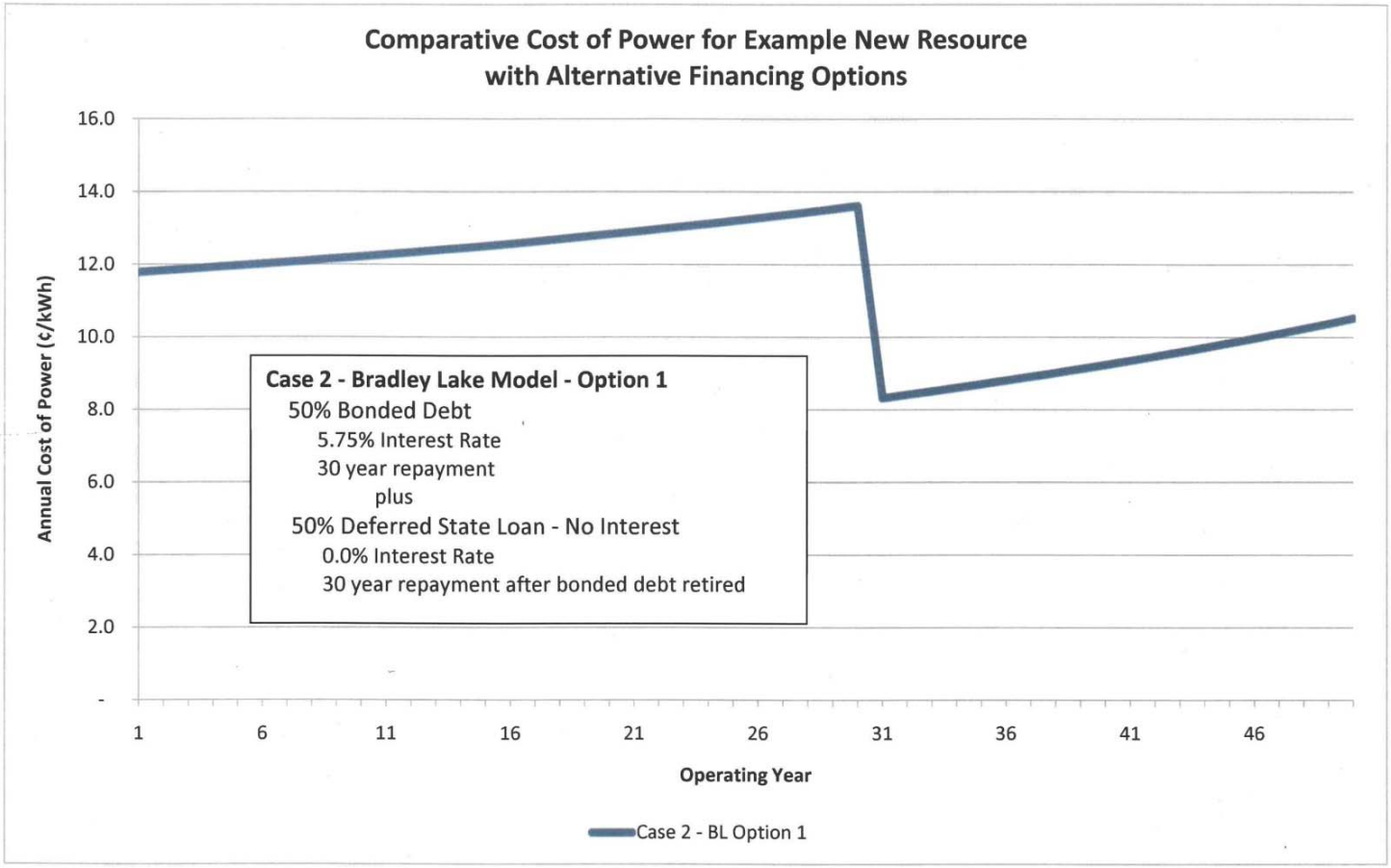
Finance Case #1: 100% Bonds – 30 Years



Project cost based on 100% bond financing over standard 30 yr period.

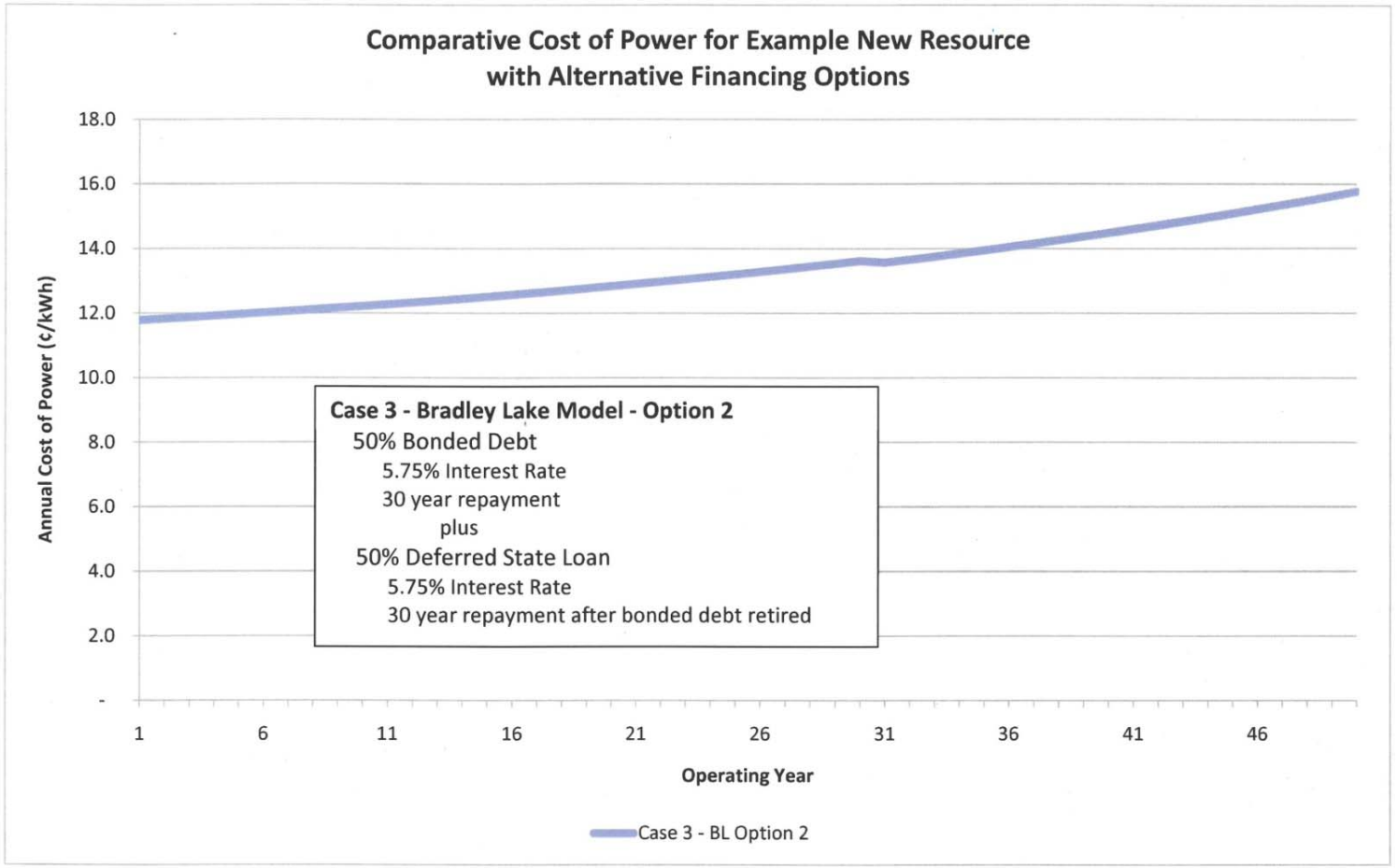
Financing Case #2 50% Bonds – 50% No Interest Loan

Southeast Alaska Power Agency

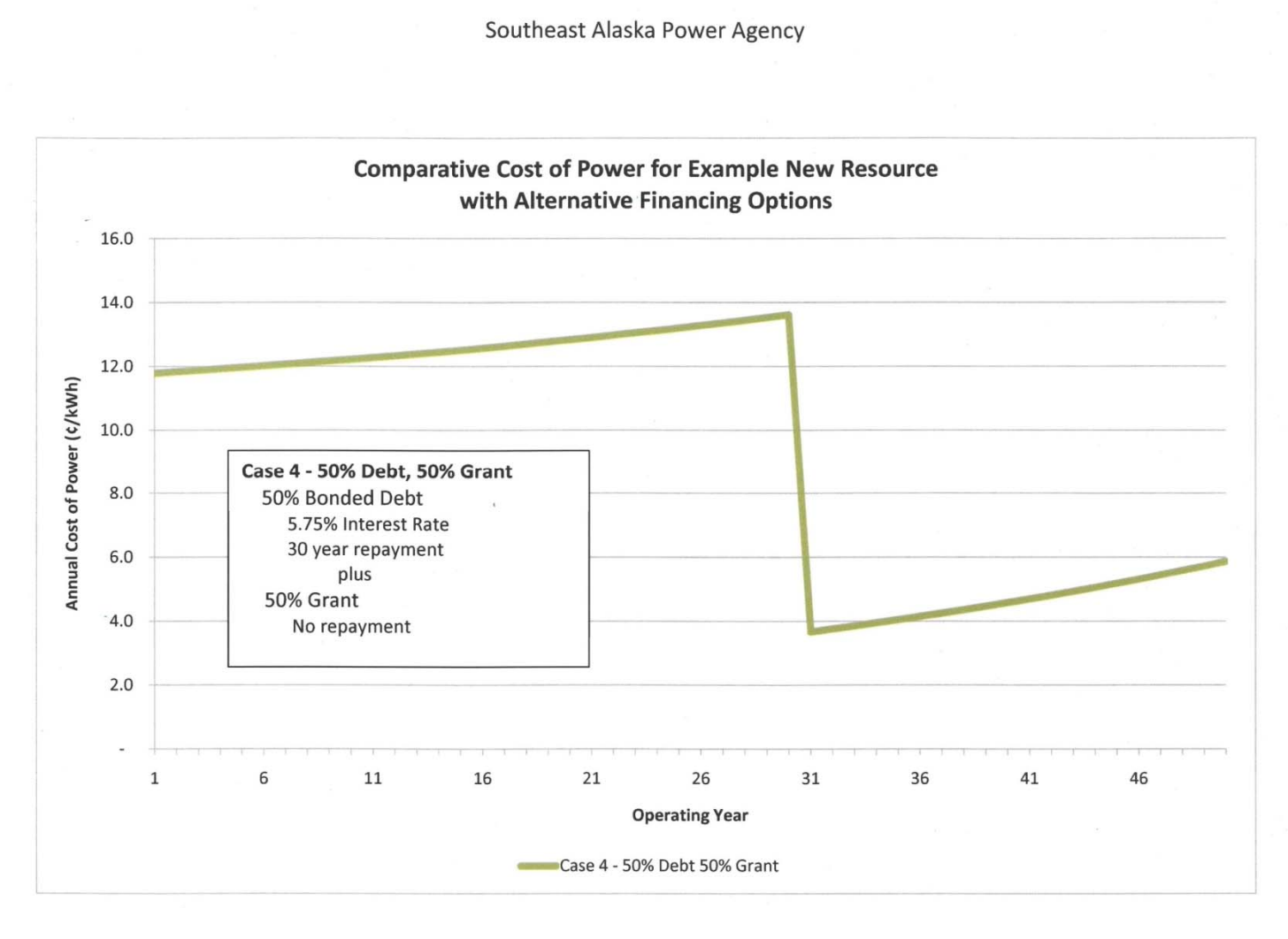


Financing Case #3: 50% Bonds and 50% State Loan

Southeast Alaska Power Agency

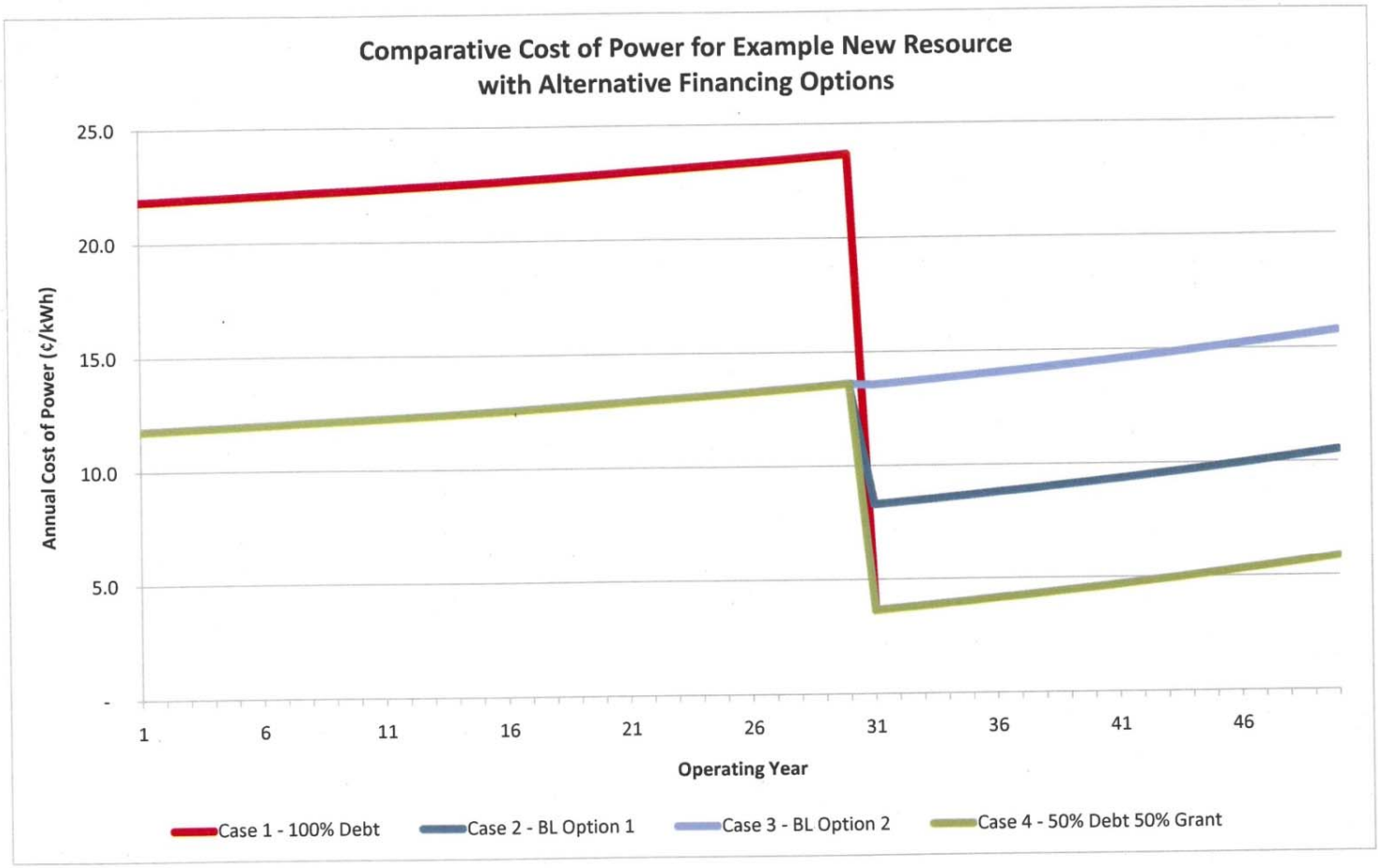


Financing Case #4 – 50% Bonds – 50% State Grant



Comparison of Financing Models

Southeast Alaska Power Agency



Summary

If the State financing mechanism is more uniform and predictable, then our long term planning process becomes more stable, and therefore more efficient.

Not just Sustainability….Growth!

Susitna-Watana Hydroelectric

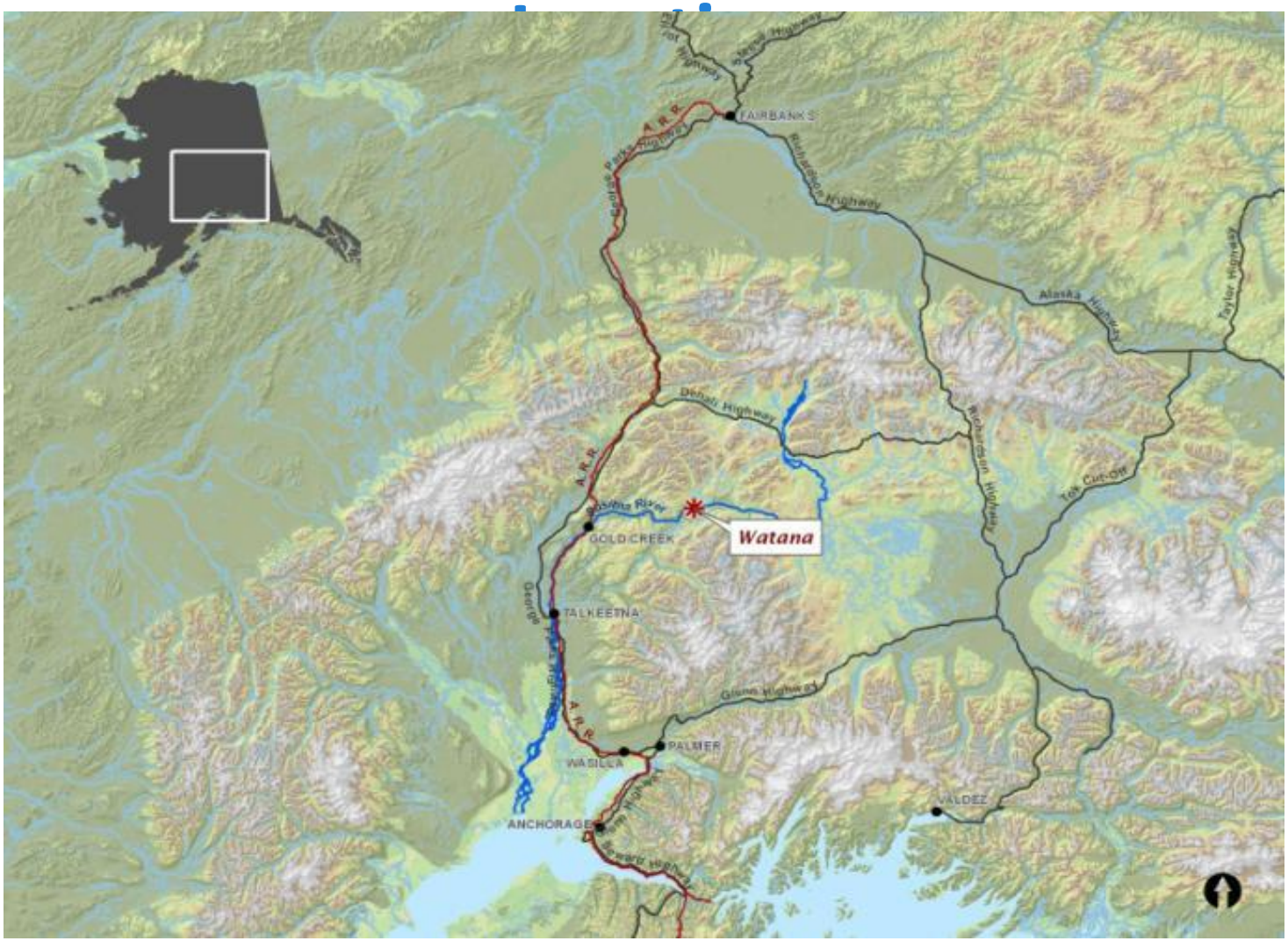
National Hydropower Association

August 30, 2011

Prepared by Alaska Energy Authority 8/8/2011

ALASKA ENERGY AUTHORITY

Susitna-Watana Hydroelectric Project



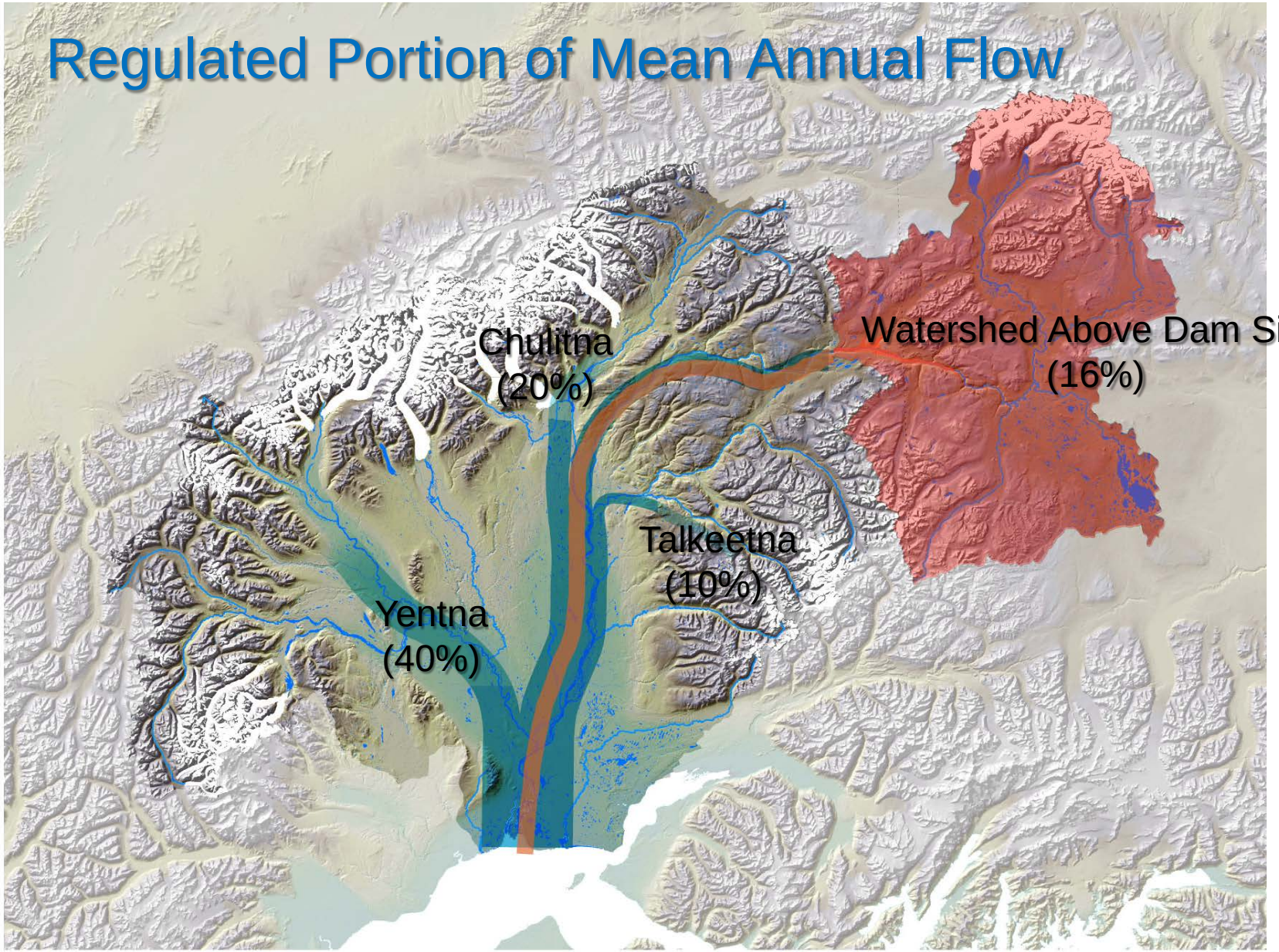
ALASKA ENERGY AUTHORITY

Susitna-Watana Hydroelectric Project

- **700’ high dam located near Watana Creek**
- **Installed capacity 600 MWs**
- **Annual average 2600 GWhrs (near 50% Railbelt usage)**
- **Type of construction not finalized**
- **Reservoir 39 miles long and up to 2 miles wide**
- **Devil Canyon rapids block almost all upstream passage of salmon**

ALASKA ENERGY AUTHORITY

Regulated Portion of Mean Annual Flow



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Susitna-Watana Activities this Year

- Gap analysis of environmental baseline
- Detailed LiDAR mapping of Susitna River drainage
- Engineering studies (Access, height, type, Operational)
- Creation of Web site (Susitna-Watanahydro.org/ and Geographic Information System (GIS)
- Additional geotechnical drilling (July-August)
- Hiring of additional staff
- File Preliminary Application Document with FERC
- Project Scoping – Public & agency meetings, working groups
- Development of environmental study plans with agencies

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Susitna-Watana Hydroelectric

Photograph courtesy of AeroMetric, Inc.

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Example of Concrete Faced Rockfilled Dam

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Al Wehdah (Jordan) Hydroelectric

Example of a Roller Compacted Concrete (RCC) dam

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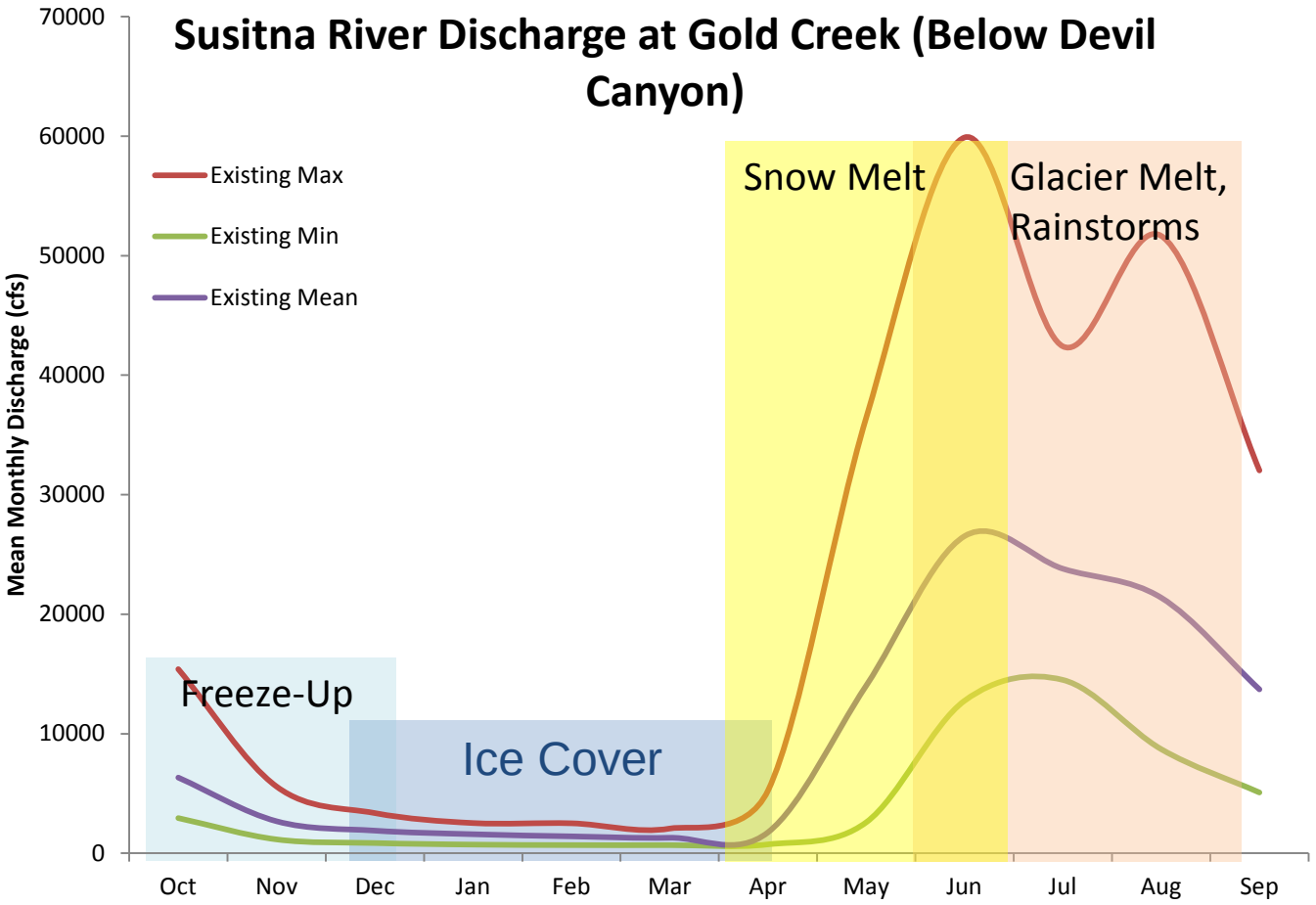

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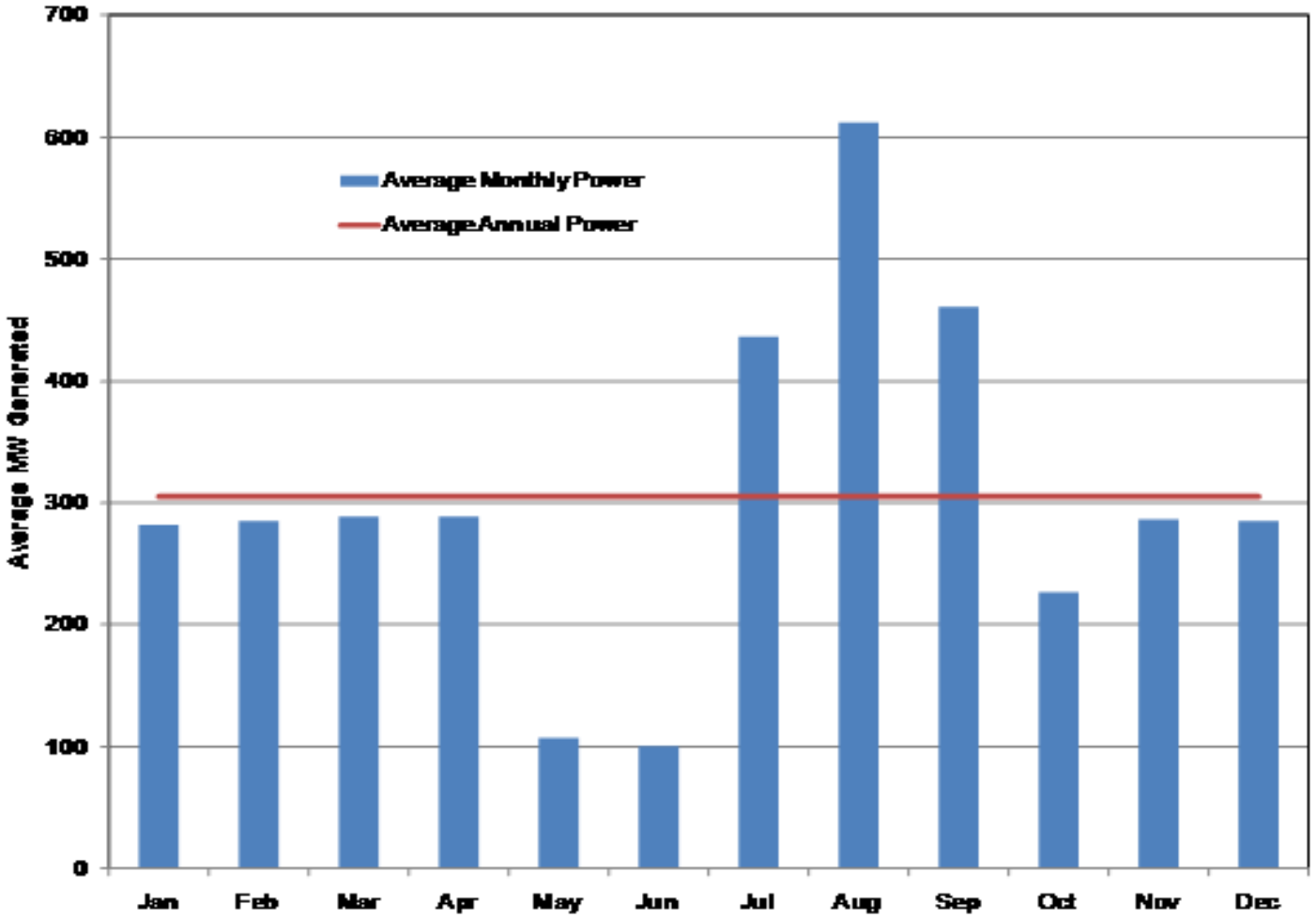
Susitna-Watana Average Output

One scenario



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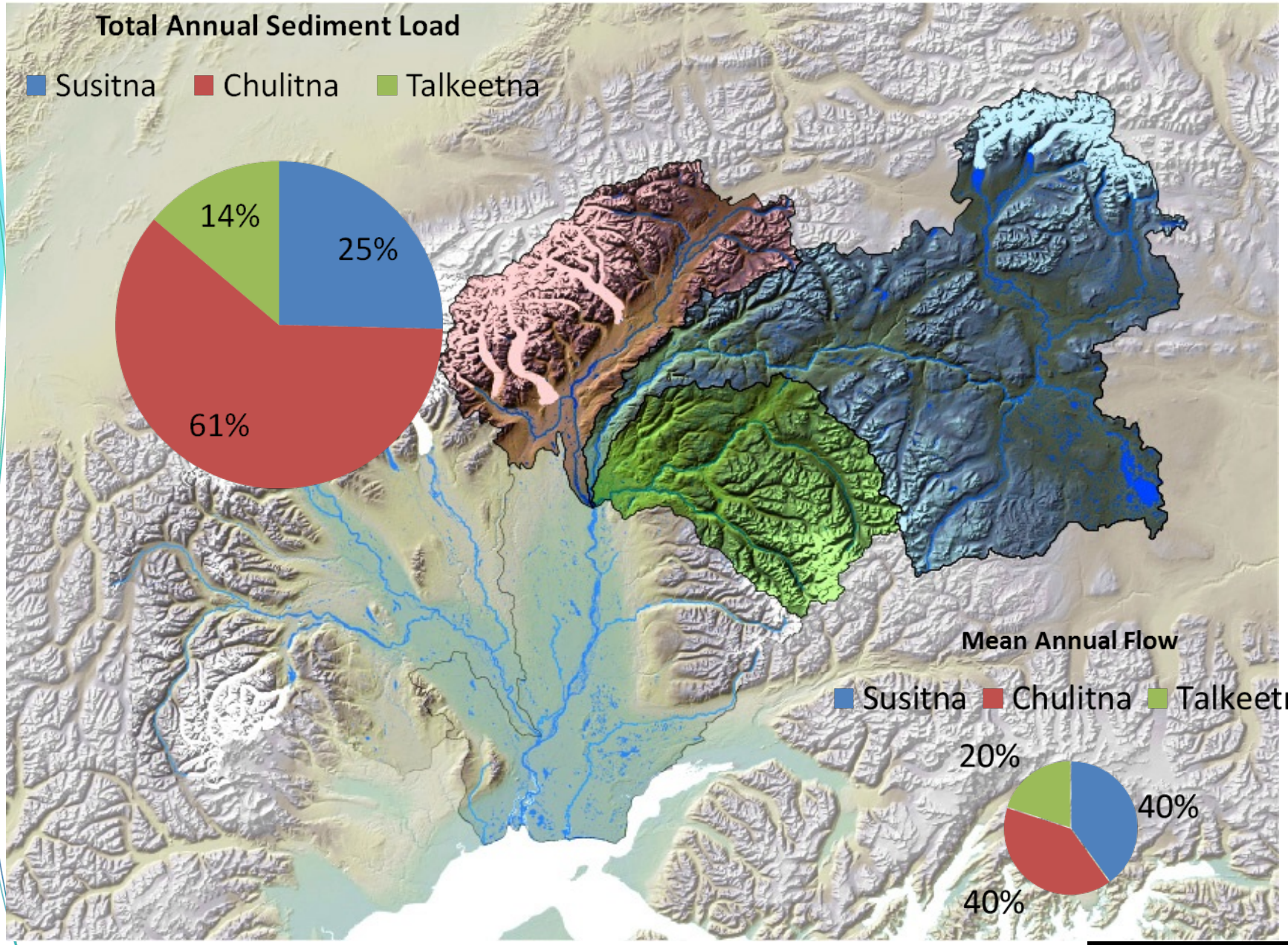

Sediment Transport Characteristics of Selected Streams in the Susitna River Basin, Alaska. U.S. Geological Survey Open-File Report 87-229

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Susitna-Watana Timeline (est.)

START-UP

Design

- Field Studies
- Public Involvement
- License Application (3.5 years)

- Environmental Impact Statement Preparation
- FERC Licensing (3 years)

Construction (4.5 years)

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11

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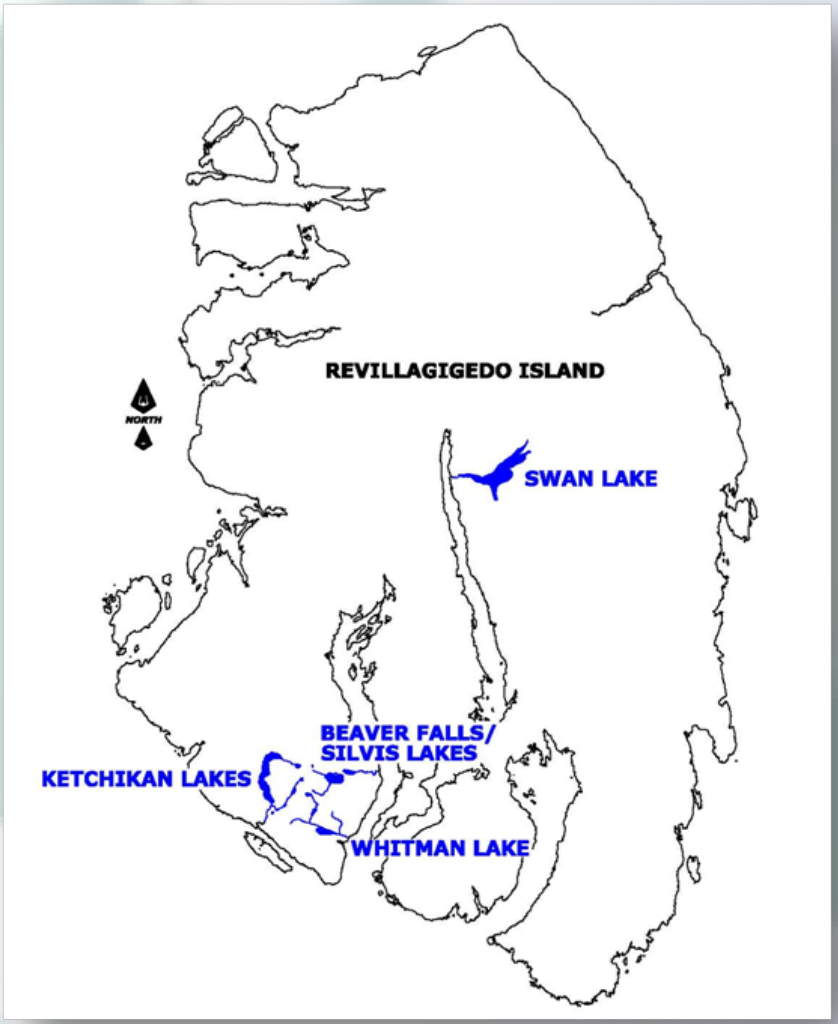
Working Together for Economic Benefit

Whitman Lake Hydro / Whitman Lake Hatchery

Jennifer Holstrom, P.E.
Ketchikan Public Utilities

Project Location



Whitman Lake

Historic Use of Whitman Lake

1912 A timber crib dam was constructed to supply power to the New England Fish Company's (NEFCO's) cold storage plant in Ketchikan

1927 The timber crib dam was replaced with a 39-foot concrete gravity arch dam

1957 KPU purchased the dam and facilities from NEFCO and retired the project

1963 The original powerhouse was burned by the Ketchikan Volunteer Fire Department as a fire control exercise

1979 The Whitman Lake Hatchery was established by SSRAA at the former powerhouse site, using the dam and reservoir to provide water supply

Whitman Lake Hatchery

(Southern Southeast Regional Aquaculture Association)

- Designed as a “central incubation facility”, where a large number of fish are reared for release at remote sites.
- Constructed on a shoestring budget in 1979. Though it has been expanded and improved over the years, the water supply system is in need of upgrading.

SSRAA Economic Impact (2007 Data)

	Total Output	Employment	Labor Income
Commercial harvest of SSRAA salmon	$8 million	110	$3.6 million
Seafood processing of SSRAA salmon	30 million	215	4.9 million
Sport harvest of SSRAA salmon	3 million	45	1.0 million
SSRAA operations	5 million	50	1.9 million
Total economic output from SSRAA activity	**$46 million**	**420**	**$11.5 million**

SSRAA Mission: “to enhance and rehabilitate salmon production in southern Southeast Alaska to the optimum social and economic benefit of salmon users.”

KPU Whitman Lake Hydro Project

FERC License 11841

Issued 2009

Capacity

Total: 4,600 kW

Unit 1: 3,900 kW
Unit 2: 700 kW

Ave Annual Generation

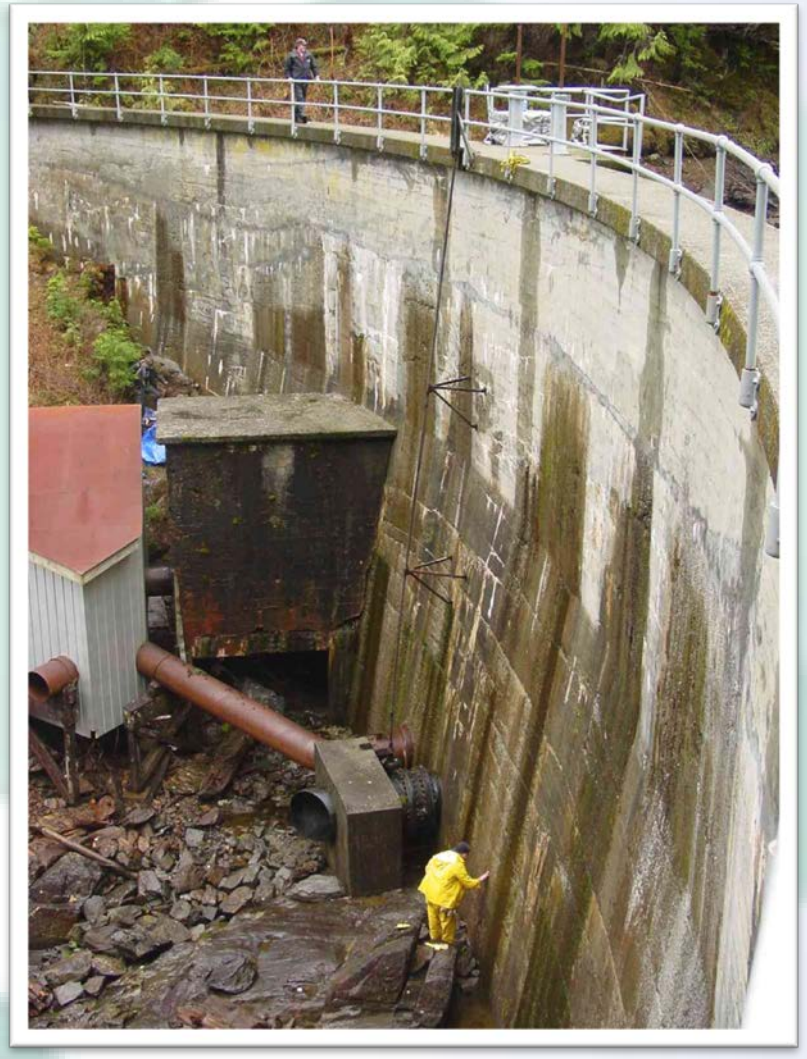
16,000,000 kW-hr

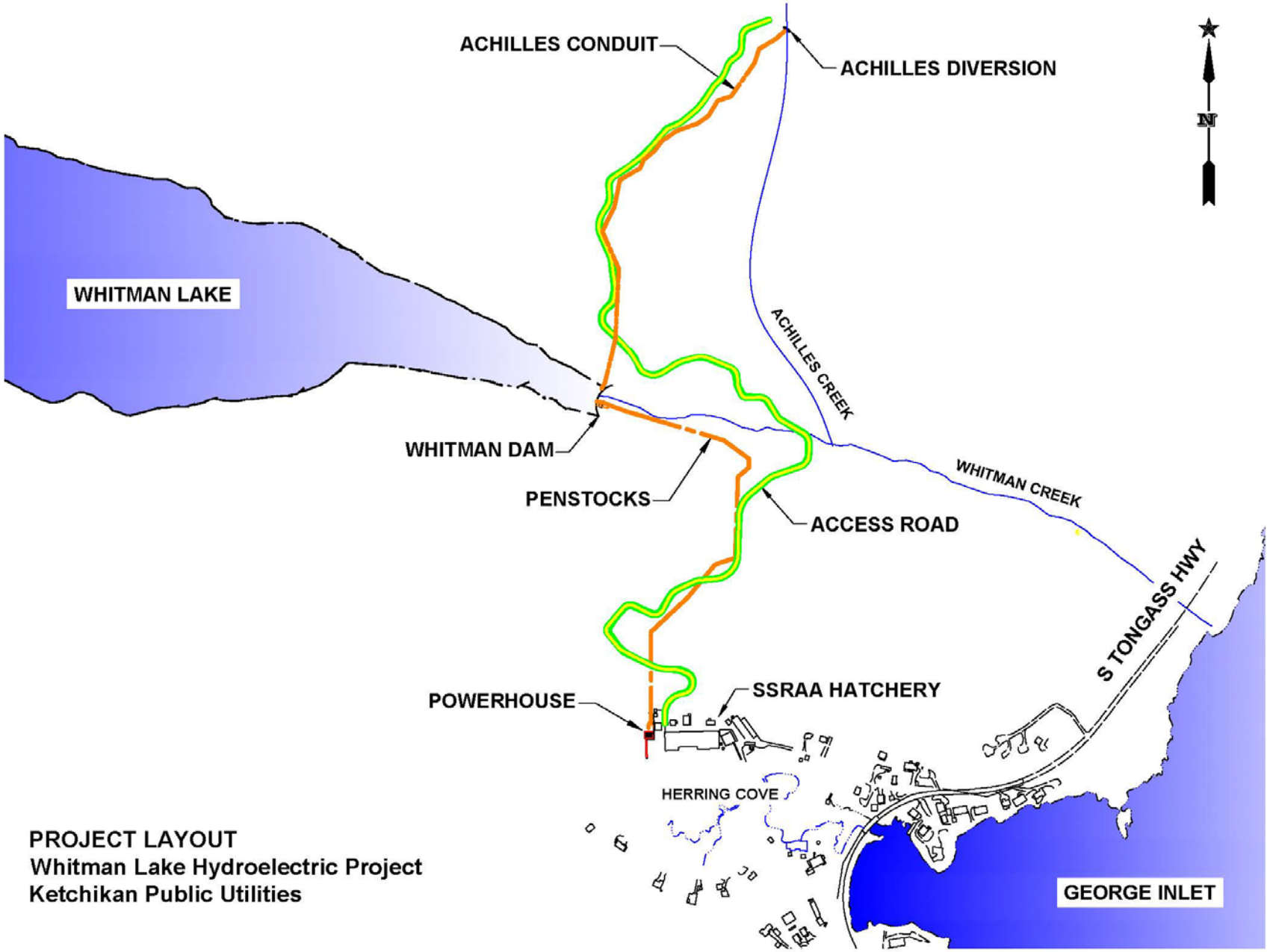
Est. Construction Cost

$24,000,000

Construction Schedule

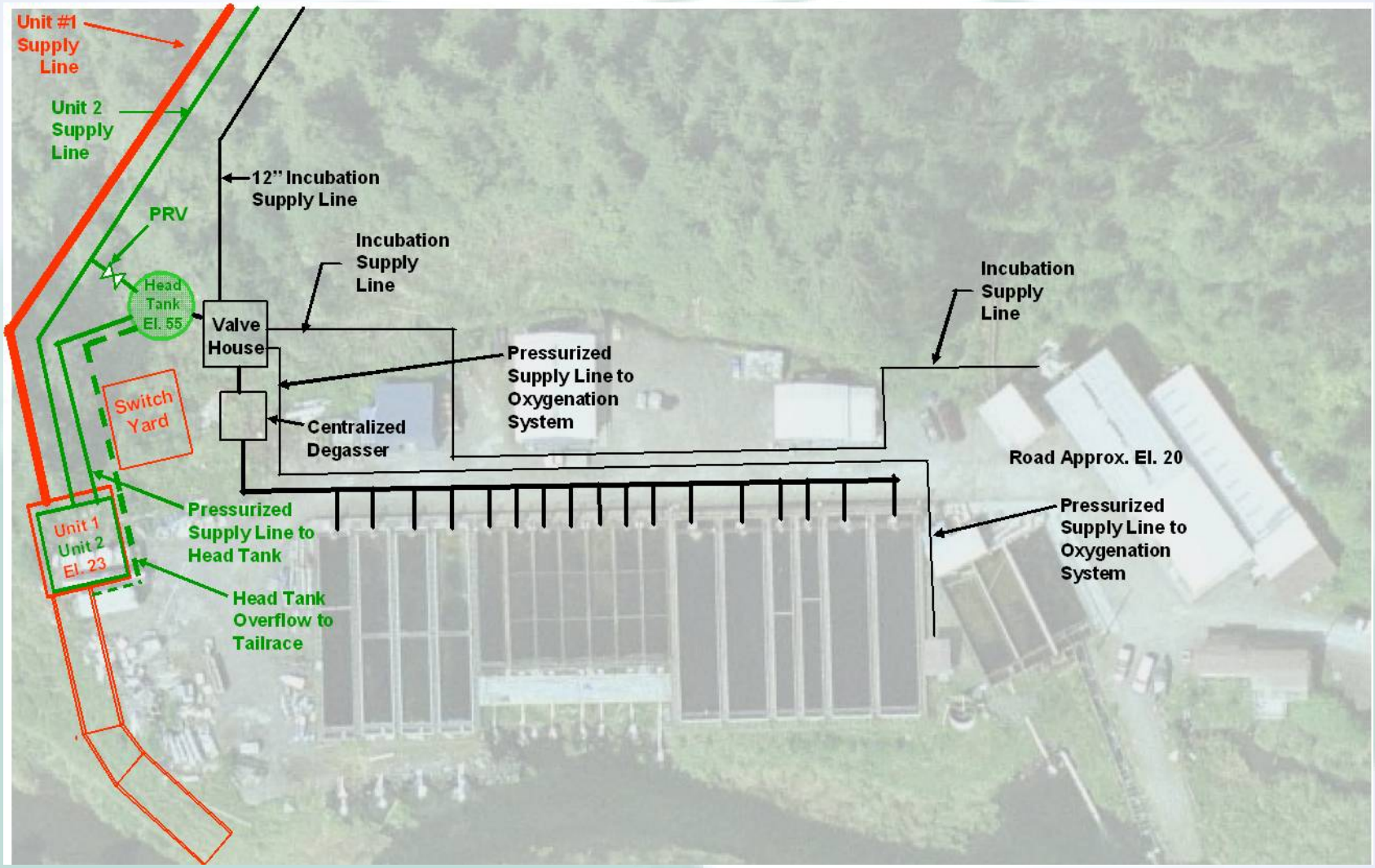
2011 - 2013





PROJECT LAYOUT
Whitman Lake Hydroelectric Project
Ketchikan Public Utilities

Hydro / Hatchery Modifications



Hydro / Hatchery Challenges

Challenge: **Accommodation of Hatchery Needs**

Solution: Multiple intakes, additional pipeline, modifications to hatchery water supply system

Challenge: **Water Usage**

Solution: Dry conditions protocol

Challenge: **Operations Coordination**

Solution: Agreement, define responsibilities, communication protocol

Challenge: **Regulatory Conditions Posed Risk to Hatchery**

Solution: Partial Settlement Agreement, License Amendments

Lessons Learned

1. Open communication - build trust, teamwork
2. Partial Settlement Agreement – carefully define issues and stick to them
3. May not succeed first time - FERC doesn’t always accept Settlement Agreement
4. Keep big picture in mind