

Summary Notes for RNWG Work Meeting, February 26 and 27, 2009

These notes accompany the agenda and PowerPoint presentations made at the recent two-day meeting. Please refer to the accompanying PowerPoints where appropriate. These notes serve as a reference for those who presented.

The following are questions were presented consideration as each presentation discussion concluded:

- * Is the list sufficient?
- * What is missing?
- * Are any of these potentially cross-cutting or over-arching themes?
- * Are there any policy recommendations we'd like to suggest adding because of this report?
- * Which recommendations should be highlighted?
- * Are there unidentified funding/technical needs?

February 26, 2009: Mitigation Topics

Attendance:

Brenda Holden, Indra Arriaga, Doug Vincent-Lang, Clint Adler, Jacki Holzman, Bob Swenson, Dan White, Jon Zufelt, Buck Sharpton, Molly McCammon, Bob Pawlowski,

Public input: None

Phone participants: None

Discussion prior to presentations:

Bob Swenson raised the question about how to manage the prioritization process.

The group engaged in the report outline discussion, the following thoughts were presented:

- Priorities will fall out/framed by group, brought by sense of vision. Research priorities will fall out.
- Suggestion that RNWG presents approaches to enable logical research needs to rise to priority list.
- Valuable to define sense of urgency within context of the impact and meaning of the recommended priorities.

- Question arose, “What do we want the document to do?” Suggestion: list of Research needs across disciplines/topics and let policy makers decide, or be decided by funding possibilities.

The RNWG discussed two general approaches:

1. Present a list (or menu) of specific research needs across disciplines/topics and let policy makers (subcabinet) determine actions/priorities based on their judgment and/or on funding opportunities.
2. First identify, describe, and prioritize strategic and desirable outcomes and then map recommended short and long-term research needs to systematically address those outcomes.
3. The group agreed that it had a role in critically assessing and prioritizing the policy recommendations and research needs identified by the Technical Working Groups and Advisory Groups.

Presentations

Presentation on Oil & Gas: Bob Swenson

PowerPoint presentation: RNWGOilandGasFeb26.pdf

Focus: Mitigation of CO₂. Oil and Gas TWG is very focused on needs. Presentation set the stage for discussions on state emissions.

- Alaska emissions: ~52 Mmt CO₂ equivalent, .7% of US emissions—about 5th from bottom
- Alaska Title V emissions: O&G operations ~15 Mmt CO₂e

North Slope emissions high—need to focus mitigation efforts

TWG prioritized research recommendations: 3 areas: Conservation, Thermal Energy Efficiency, and Carbon Capture and Sequestration (CCS)

- Conservation:
 - Overall conservations activities, i.e. reduce liquid fuel consumption, other best practices
 - Reduce Fugitive Methane Emissions
- Thermal Energy Efficiency:
 - Electrification of Oil and Gas Operations, with Centralized Power Production and Distribution
 - Improved Efficiency Upgrades for Oil and Gas Fuel burning Equipment

Use of Renewable Energy Sources in Oil and Gas Operations

- Carbon Capture and Sequestration (CCS)

CCS from High CO₂ Fuel Gas at Prudhoe Bay

CCS from Combustion Sources in and near Existing Oil and Gas Fields - Focus North slope

CCS away from Known Geologic Traps - (Interior Alaska)

IPPC models—includes prioritized recommendations: includes CCS, fifth on the list

CCS not well understood—lots of research that needs to happen.

To sequester carbon forever there are lots of parameters that need to be addressed (capture/store).

DNR working on report about capacity—traps/storage sequestration

Technical Slide: first 4 on list from TWG:

- Feasibility of various entrained and exhaust CO₂ capture technologies for North Slope and Cook Inlet
- Study where renewable energy sources co-exist with Oil and Gas operations
- Feasibility of using hydrogen produced from methane as a fuel source
- Feasibility of producing power on North Slope, capturing and sequestering the emissions there, and using long term transmission lines to deliver power to markets

Additional bullets from Alaska Forum on the Environment (also includes other focus other than mitigation):

- Bathymetry and Detailed DEM information (Industry is currently collecting this information but it is not made public)
- Regionally appropriate baseline physical mapping and imagery including bathymetry
- Regionally appropriate baseline mapping and monitoring of surface and subsurface (groundwater) hydrology

We don't have base line data.

Thermal Energy Efficiency at Oil and Gas Operations (Sequestration slide): key—proven trap. Going to areas without trap—research to see if it will be traps are permanent.

Question from RNWG member: on cap penetration from well—well sealed/ what is the impact of penetration.

Response: Need to cement around it to make sure that seal holds. One of the question that arises nationally is in 60-100 yrs, who is viable/liable should the seal fail?

Infrastructure slide: what do we need to do to mitigate changes seen or identification of critical infrastructure risks associated with: wetlands, permafrost, seasonal lengths, etc.? What changes will be necessary with platform designs? How do spills on broken ice get cleaned up?

Economic Slide-- Economic analyses need to be done for effect on revenue streams impacted by carbon mitigation efforts. What is the short term and long term value of carbon?

Question: The group asked if methane was being analyzed by TWG. Answer: No, the numbers are not clear, needs to be looked at, also fugitive emission.

Question: Who owns traps? Answer: State/feds own physical traps; private companies lease them, which generates royalties. A concern is who takes on liability after the leases are up/done.

Question: do lease options include/exclude sequestration?

EPA: important to monitors what EPA is doing.

Question: what is the State's role—providing incentives with policies? What are people's feelings about urgency of sequestration? Answer: there is across the board urgency.

Point of clarification: does CO2 looked at from burning at fields? From burning for operations.

Cross-cutting theme possibility: lifecycle cost and impacts – from O&G looking at production, to looking at transportation-- at different place in continuum/lifecycle of product

Question: Are mitigation levels are kept in mind as leases are drafted? Answer: Yes, but they are predicated on many different issues.

While the state can put all kind of rules in place, it has to avoid extreme policies that could kill development. Consequences of sequestration are not well understood especially long-term consequences. That is where liability issues arise.

As a follow up—the concept of “no regret” policies/actions came up. Clarification indicated that this means pursuing policies and actions that are beneficial regardless of focus. In other words, in reducing carbon emissions is beneficial, it should be pursued regardless of the specific topics it applies to. There was continued discussion on the topic of ‘No regret’. There was support for doing things that are beneficial across the board, and also concern that the concept was too wide and attention should be paid to economic impacts.

The comment was made that the state should be proactive, not reactive. If national policies adversely affect Alaska, do we have enough research to deal with these policies? It is important to look at cap and trade as a policy option.

Report thoughts: The focus shifted to the RNWG report process. Comments were made that before the RNWG members write, it is critical to know audience and purpose of report. Important to be brief and structure the report so that it addresses action or impact.

Transportation & Land Use: Jackie Holzman

PowerPoint Presentation: RNWGTLUFeb26.pdf

RNWG received approximately nine policy recommendations and four research ideas.

Focus: Looking at lifecycles

Alternative fuels—do we have data that they will be more beneficial? Lifecycle costs in Alaska different than outside.

Transportation Modes: Transportation planning is needed. In looking at fisheries, for example, is there research being done on how we get fish to market through a systems approach, making planning systems not project focused. Need for integrating modes, coordination of networks

Goal: develop tools and methods to get to transportation planning—a meaningful product for what we are doing statewide.

Discussion on marine vessels: clean air act forcing less particulate discharge. Where is the tipping point - the more efficiently you burn, the more CO₂ in produced (black carbon) but produce less particulates.

Comment: In order to 'lead by example' research needs to be done on what will get people/industry to follow the state's lead.-- Perhaps the research need is to identify what will get people to do it. For example, what is the incentive to conserve?

Comments reiterating that the state needs to take both a systems approach and leadership role.

General comment: We are not sure we have enough/adequate research to respond to issues. Example: wild Alaska salmon has higher carbon footprint than farmed salmon and therefore the demand for wild salmon is suffering. Research is needed to find out if this is true. What are the lifecycle costs of both kinds of salmon?

Question: do we have enough data to compare modes of transportation? The data is nation data, and it needs to be analyzed to see if it applies to Alaska. We do not know if we have enough Alaska data.

Comment that scenario based planning would be beneficial to exploring the impacts/feasibility of switching modes of transportation.

Research question regarding parameters: What makes sense in Alaska?

There is a need for integration of public perspectives, which usually revolves around community planning, or land use in rural Alaska. The TWG focused on urban issues, but state issues are wider than that, i.e. Village relocation. Research is needed to understand mitigation from an Alaskan perspective.

Need to understand land use. It seems that land use planning and focus is on revenue generation. The state is in need of land use planning in coordination with energy planning, long-term use and carbon footprint. Incorporate climate impact into land management decisions. Concern that decisions come down to economics. Recommend that the state look at existing and new land use plans in state with carbon footprint in mind where economically feasibility (with economic consideration).

Recommendation: develop tools to allow the analysis. There has to be reasons to do things: Need to have better understanding and know what is applicable to Alaska; how to incentivize conservation, public land use; better understanding of 30% of emissions that are produced in the transportation sector in AK; better understanding what AK will be charged for, regarding GHG; Recommend that carbon footprint be part of all federal/state, local and departmental considerations.

Presentation: Cross-cutting issues: Buck Sharpton

No PowerPoint presentation.

Before the presentation, Clint Adler provided summary of morning contents. A recommendation was also made that the IAWG policy recommendation template be looked at for tomorrow's discussions.

For this presentation, the RNWG had indirect interaction with the TWG.

Needs fell into three broad categories:

1. Data management issues – we do not do a good job at managing data, unsure of the historical value of data—when it is lost, it is gone forever. Accessibility of data: How do we ensure data is archived and remains accessible? Need to ensure that formats are updated. Development of metadata- important to know if we are using data appropriately. Development of metadata needs to be done early, when done later, developing metadata is difficult and time consuming.

Researchers in the field are making individual/independent observations. Often there needs to be qualifiers put into dataset to let people know limitations. Retroactively, it is difficult and costly.

Challenges: datasets are often collected with one objective in mind, but we are trying to use it for something not intended.

Problem promoting access and availability of data. No one wants to fund archiving or data management but these are imperative to having good sound data. To do this adequately requires a level of coordination across federal, state agencies, university. This coordination is not there now.

Someone has to make a decision about existing datasets, which are valuable, which are worth preserving? Who makes that determination?

Question was asked if there are good models of successful data management, integration, etc. It seems that at a big level, this does not exist, but there are focused agencies programs like GINA that offer a model: <http://www.gina.alaska.edu/page.xml?group=data&page=submitdata>

The concept of developing research infrastructure was offered, with a component to develop capacity in understanding the context of data collecting mechanisms.

There is a need for data archiving policy at all levels: mandate requirement to preserve data when using federal dollars.

Information was offered that the USGO is pushing a similar effort forward, establishing metadata standards. The question was asked if the state should rely on federal government for this. States in general are taking a lead role to influence feds.

Should there be some requirement for anyone doing research on/in/about Alaska to share information with Alaska?

Comment that not abiding by standards has made the US fall behind European countries and there should be a focus on national competitiveness.

Point was raised that we need to understand what is going on at the community level; even when finding what infrastructure is available in a community, the results do not tell you what you need to know about the community and climate change impact.

2. Monitoring issues – Encompasses everything we do, need system approach with an eye to long-term impact of climate change. Monitoring initial characterization, observations fed into models—observations key—allows and extends and test viability of models.

Broad monitoring types: buoys, geophysical, hyper spectral, etc. Hyper spectral is explained as radiance analysis/measurement, example: in measuring forest stress.

There is a need for a standard for monitoring, long term monitoring data and techniques to be standardized over long period of time. Preservation of data is critical and there are funding issues.

Question: is this a government function? Is there a potential private role? Comment made that private role/focus is in products you can sell—not altruistic focus.

Recommendation that products, services and education/outreach get documented to main database list.

How to capture and incorporate anecdotal/traditional knowledge into research is an issue.

3. Modeling issues: modeling is the only way of forecasting, a way of extending capabilities of monitoring in space and time. If you can model, then you can fill in gap in observations.

Climate change—GCM have limitations. If GCM models are used for making decisions, they need to be downscaled, bring information down to the community level.

Are there any thoughts about how long modeling into future should be, do we need modeling standards? There's a need to better understand of weather models—for short-term impact; and, trending exercises to look at years ahead. It is also important to bring models to local community leaders.

Suggestions made on developing sophisticated tools to incorporate socio-economic and cultural factors. Suggestion: deterministic models, parameterization; probability distribution function for analysis and design. Consider basing designs on taking old data.

There is a need for coordination, updating, and promotion of accessibility, richly populated metadata, standards, and formats. Presently, cannot anticipate full range of monitoring needs.

Comment made: often managers are not able to use some of models' information. Tools need to be packaged in a way that they are useful, need ability to fund a group capable of doing that.

Reference to SNAP: one of goals of SNAP – user decision-making tools, there would be expectation that private industry would respond, especially if money and need are there.

There needs to be better communication about why monitoring is of value and important. There are models out there that are good. Outreach entity is also necessary, development models and continued investment. iPhone example: Many different components/partners delivering content—it works. Can't make the burden too heavy for one organization—distributed data model recommended.

Recommendation: capacity either exists through university or private sector—recommend building capacity through University.

Comment made that the Fishing industry is successful because of monitoring—allows better management.

Need public investment in metadata; indoctrinate students with documentation standards

Presentation: Energy Supply & Demand: Dan White

PowerPoint Presentation: RNWGESDFeb26.pdf

Slide 2: Six policy options ESD TWG: pulled research needs out from options

Slide 3: ESD 7/8/9: Tried to focus recommendations on Alaska

Slide 4/5: ESD advanced power generation technologies do not receive attention—need research area to explore

Slide 6: carbon sequestration/management – ESD focused on mitigation –only carbon reduction/management

Slide 7: issues:

- Allow/accommodate utility risk-taking in technology (regulatory)
- Statewide budget and funding of R&D (legislature)
- Agency support for systems testing (DNR, DEC, etc)
- Permitting (agency, municipality, village, and landowner policies)
- Exploiting vendor demonstration opportunities.
- Using and developing capacity at the University of Alaska for R&D

Slide 8: listing of parties involved

ESD research into 2 groups: Minimizing production of carbon and management of carbon once produced. See slides 9-14.

Regarding other technologies: Geothermal, there are many ways to do it, need to understand options. Biomass-- Basic research needed on what is the resource, resource assessment—what are the cultural impacts?

Hydropower –research into fuel switching; seasonal water availability (different from hydrokinetic)

Minimizing carbon into diesel grid is problematic. Hydrokinetic—untested in Alaska

Question: Are offshore wind farms possible in Alaska?

Common themes:

- Applied research is needed
- Technology testbeds (e.g., ACEP Hydrokinetic Energy Research Center)
- State and University partnership

Question on whether University had contacted at all about 50% reduction using renewable state plan— is it possible? Consensus that it is possible but projects would have to be brought online like Susitna Dam or other projects.

There could be a big change in the Railbelt, and in rural areas through renewable, although the rural areas will still need diesel.

Recommendation that RNWG should consider reframing research goals on/around minimizing emissions.

Recommendation: storage of wind power and other energy as area of research. Example given Kotzebue tested battery, it did not work.

Question on whether the TWG touch on grids. Answer: yes, #1 priority was grids; looked at making renewables work; grid policy options on large grid—and extending it.

Comment: focus on renewables –testing what is being developed elsewhere and how it applies to Alaska conditions. What expertise do we have?

Comment: Real urgency is that a lot of technology being purchased now (Denali/AEA) but agencies are not staffed, cannot evaluate technologies—there is a need to share lessons learned from each one. Need a model of collaboration as a research recommendation; research partnership with UA and agencies needed. Research cannot live in a vacuum –partnerships are necessary for feedback

Question: has nuclear power/energy been ruled out? Answer: no, it's part of document content but a lot of hurdles, technology, cultural and political

Discussion on report format/contents

Recommendation made that decisions on report format and contents be tabled until tomorrow (Feb 27) during lunch. This would give group chance to review materials.

Comment that the state lacks adaptive capacity. Recommendation that an overview of state regulation policies should be done in order to see if they are adaptive.

The group looked at the draft IAWG policies for guidance re: format.

General comments on the report:

- There should be an element of consistency in the report—consistent theme.
- We need to understand how report is going to the subcabinet.
- Recommend separate reports for sub cabinet from four main groups.
- Would be good for research group to support other groups' needs for research, plus emphasize other, independent needs
- Possible theme: adaptive capacity.
- Concern over terminology, should be careful with terminology
- Need for understanding challenges: there is a lot to do; adaptive capacity—how to make it clear
- Question: How will sub-cabinet address this information
- RNWG can go beyond scope of current TWGs, should be able to form recommendations based on sound research process
- Another approach—1 level of recommendations based on all workgroups learned—these can be things done right away with available funding. What are short term needs that can be addresses in-house, with current capacity; what can be done with some added funding; what can be done long term, what are the capacity needs and funding requirements.
- Suggestion to apply a matrix approach
- Identify what needs to be done and where would be the most benefit. Combined reports may be too big—RNWG needs to be focused.

- Need to determine what kind of goal are we going to do? Based on communities in peril?
- Determine biggest needs through accurate information. Look at infrastructure. See if there are 2 or 3 things that need to be focus on.
- Look at what is out there, perhaps a lot of the work has been done through other groups---take IAWG format and interject other groups' priorities. Look at "Special Report 290"—14 recommendations from the National Academy of science—(TRB SR 290)
- Base policies and goals on best available science—western and traditional. Successful—measures, monitor and evaluate—promote proactive and adaptive approach with better decision-making tools.
- Importance of coupling state's energy strategy with its climate and economic strategies.
- Look at new report "Restructure Federal Research Climate Change"

For February 27: Group will review materials cited today. February 27 agenda is changed: RNWG will work through lunch.

-Clint will send out 14 recommendations

-Bob Winfree- will send 10 page document for copying

-Four policy recommendations from IAWG for format review

February 27: Adaptation Topics, Report structure and 1 Mitigation Topic

Attendance:

Brenda Holden, Indra Arriaga, Doug Vincent-Lang, Clint Adler, Jacki Holzman, Bob Winfree, Dan White, Jon Zufelt, Chris Maisch, Molly McCammon, Bob Pawlowski, Jackie Poston

Phone: Fran Sussman-afternoon

Public input: none

Presentation: Public Infrastructure: Clint Adler

PowerPoint Presentation: RNWGPUBLICINFRASTRUCTUREFeb27.pdf

Slide 2:

Public Infrastructure TWG advanced a vision: state needs to take system approach to Climate Change. Their guiding vision reflects a focus on sustainability, communities, and managing risk. For example, DOT operates funding decision on a project-by-project basis and sees funding as an expense—funding needs to be seen as an investment.

Current system is reactive to public pressure and short-term interest.

Vision: Sustainable infrastructure that supports communities in an uncertain environment.

Slide 3: 3 components to the Vision

1. Accomplish systematic data collection, analysis, and use.
2. Implement a “no regrets” policy for existing public infrastructure (win-win strategy)
3. Build to last. Build resiliency into Alaska’s public infrastructure. Currently, infrastructure built to last 50 yrs, there are no plans for rebuilding or preserving even though it is cheaper to maintain than to build it again. There are many reasons for this way of doing things. The federal funding structure encourages this practice.

Slide 4: graphic--Pyramid based on collecting and analysis data—it depicts interdependent, integrated decision-making

Slide 5: Public Alaska Forum on the Environment input:

Call for integrated approaches to planning. Currently departments like DOT do not ask the question: What is the best for Alaska transportation system? Agencies do not coordinate: and there is disjoin between modes of transportation. Need to look at best practices—how do other states, other countries do it?

We don’t maintain our investments: We often don’t know we have a problem until it has failed.

Slide 6: Public Infrastructure Research Needs

Update climate change models and develop tools for practitioners: SNAP (include flood level forecasts), Alaska Environmental Atlas (AEDIS)

Link Planning with Execution: Identify barriers to implementing mitigation and adaptation strategies.

Engineering: Update engineering codes and standards, Develop probabilistic design tools and methods.

Slide 8: Operations

State does not monitor what is built. Lack of funding investment, need to look at intelligent technologies—nano/smart sensors, effects and real cost of permafrost degradation.

Slide 9: Maintenance: need to establish baseline infrastructure inventory.

Comment: How does DOT know when something happens? Answer: When it gets a phone call that it has happened. Asset management is lacking, there is a need to monitor economic value and life/conditions of assets

Comments from group:

- Monitoring data is foundational, currently monitoring funding is about .5% for projects.

- Monitoring used by/for operators, need to bring the need of monitoring levels up of usage and understanding
- Need to present monitoring in a different light—sell the importance of an end—monitoring as necessary, turn it into a necessary step, so when funding is made, it is made for the end result not just the isolated idea/concept of monitoring
- Need to focus on outcomes
- If sensors are put in place during the building phase, it is cheaper, but have to have use for data to sell idea
- Have to have plan to link data from monitors to researchers—make sure researchers can use the data—accessibility
- Actions based on projects alone do not work—agency systematic approach is needed
- Also need accountability, responsibility
- Can the state lead by example: state has lots of Public Infrastructure (PI)—do we have complete enough database of PI to make recommendation?
- Depends what it is that the vision is being achieved—focus on policy, not objective. Focus on one makes us miss the boat in other
- Need community based maps—do have the data
- Industry itself has tools—Alaska does not use them
- Question: are there tools on permafrost? Answer: no—not statewide. For example, permafrost changes under buildings, so there it is an issue of the building, which is built with certain assumptions such as presumed changes temperature, the freezing degree days and mitigation—but the assumptions could be based on old trends before acceleration of climate change—could be mitigating for inadequate assumption.
- Scenario modeling needed. All design need to take into account scenarios/ models Current models are pre 1984 –we’re really behind. Need to update the atlas
- Can the RNWG embrace system approach?
- There is information missing—community—interconnectivity of communities missing
- Tie into planning side: though largely ignored, there is lots public input during a process. What we don’t do well is integrate socio-econ impact into designs. Need to integrate local knowledge.
- Another issue is that transportation planning largely focuses on roads and rail and forgets to incorporated planes into vision. Can the group look at the system, and ask what does the future look like? What are all the components of future transportation modes—what research is needed to ask questions?
- Scenario planning –visualization tools, present to public—what should we be planning for? Look at overlaps between scenarios: social, economic
- Decisions get made that make sense others—not to Alaska. Decisions are impacted by fed funding agencies but don’t take into account needs/characteristics of Alaska. Recommendation: look and articulate what makes Alaska different. Be proactive.
- Circumpolar issues are relevant to Alaska
- Adaption piece to climate change for PI requires monitoring element in different package. Format of deliverable matters: Environmental online didn’t work.

- Need to make a point that tools for developers, warning systems, etc, reduce risks
- Need to articulate that research is a driver in the state: as an industry and to propel industries
- Historically, the state does not fund research. It is funded through the Federal government and private sector. What can be done to change the research funding dynamics?
- We need to sell the investment story, how to take advantage of economic opportunities and our need to understand climate change. Need to understand: to whom are we selling? What motivates them?

Presentation: Health and Culture: Bob Pawlowski

PowerPoint Presentation: RNWGHealthCulturalFeb27.pdf

Slide 2: Health Research Process:

1. Research needed to identify indicator in sentinel event to happen. For example, the Pandemic Flu 1918: understanding respond –exposure. A database has to be created and ongoing for sentinel events past, potential—Alaska culture is closely link to environment
2. Once database in place, develop a health model—how to collect local level data
3. Conduct health impact assessment - lead to monitoring tool

Slide 3: Community event research matrix

Sentinel Event and vector: Range extension –links to Natural Systems. Issue of re-exposure with thawing of permafrost—concern that the 1918 flu is still viable through exposure of graves, erosion of graves at low end of watershed puts the water at risk.

Need—model and assess physical/mental health parameter. Is it affecting traditional lifestyle?

Slide 4 : Need to look at social aspects-- how well distributed and effective are current health services. Research is needed to show good health policy. Standardize social network research.

Question: why standardize? Answer: because it's being done throughout disciplines-- it is a way of applying –modeling—standardization needed to compare one to another.

There are very clear anecdotal messages to identify communities at risk; we need research to model local economies for social and health risks. There is a need for scenario planning—giving alternatives. Example, need to understand sanitation policies in relation to climate change—what are the risks and environmental variables? What are the economic considerations or seepage impact in relation to climate change?

A major issue is how to document and preserve cultural sites—confidentiality issues, research methods to facilitate analysis. Also important are language/story catalog preservation. This is climate change

relevant because traditional knowledge used to give direction, and environmental changes – historical trends. We need to tie it back to climate change research. Research links needed between traditional and west knowledge: people know their environment—western data is needed to support traditional knowledge and observations. It is a good idea, as part of adaptation to actively involve young Native people in climate change research.

Slide 6: Review ADF&G surveys to document patterns of use to provide decision-makers on the dependency of traditional subsistence—by species and pounds.

Do we know what is going on in communities? Socio-economic cultural research—is it being monitored? What is going on that allows coordinated future planning? State/federal policies impact on sustainability—is there an understanding? It’s a mixed bag. Are there barriers to allowing communities to have an impact on federal/state policy? Regulations that make sense in other places do not necessarily make sense Alaska.

Recommendation: Review policies that are counter-productive to adaptive strategies. Who decides the future of communities? What do you mean by sustainability in light of climate change?

Slide 7: There are many cross cutting points: mapping, models, engineering assessment, cross-agency coordination. Need databases leading in right direction, data sharing to support granted research, work groups, inter-agency collaborations.

There has to be an education component written to this—public education and workforce development. We need a strategy that allows communities to monitor impacts of changes in their communities. How do you get observation protocols in to the community? How to deliver inform/literature in to communities. Broadband a problem? Important for climate change research access to programs

Question: Did TWG research on contaminants? Answer: No. Need to research what are the health impacts from climate change. Identification: Vector borne, dust (asthma), breathing difficulties. Scenario planning would present all probability.

Concern that “touchy feely” recommendations get ignored. We need both hard facts/correlations and human stories. To see the world change in a single generation causes stress, cultural shifts.

Recommendation that H&C focus contaminant research as it relates to climate change and cross-cutting research needed. Need to articulate tie between climate change and challenges to communities and culture. Example: Traditional ways of preserving foods not working due to change in climate. What are the social impacts if you break traditional cycles—Need to document.

Report format: Givens and suggestions from

Jackie Poston and RNWG discussion: givens and suggestions

- The main report to the sub-cabinet has a lot of moving parts—all recommendations to sub-cabinet are due at the end of spring.
- Report: should be a report for whole stakeholder process to sub-cabinet—take research and weave it through. Sub-cabinet to review and parse to departments for ground.
- Get public input
- Strategy will emerge for report to go to Governor. Palin. It is unclear who will draft final report
- Question: what goes to the sub-cabinet? Separate reports from 4 major groups? Answer: yes. RNWG should draft report as a standalone and to be integrated into final report along with others. There should be consistency in style from section to section/ TWG to TWG.
- In order to facilitate weaving RNWG report into others, use continuous numbering system (1, 1.1, 1.2, 1.1.1 etc) no letter, similar to NPRB plan. Provides for scalable continuum—order by priority.
- Prioritization— budgets are diminishing at all levels, it behooves us to be strategic, what are the must do's, prioritize accordingly. Have a clearly stated ranking system.
- If too much information is presented, it will be overwhelming. Still, details are important for implementation, therefore, the idea is to be targeted—potentially doable. Detail in appendix.
- Concern that this approach is task oriented, RNWG is discussing outcome-oriented strategies. Report needs to have both elements.
- Who is the audience: Legislators, Sub-cabinet, and/or the Governor? Controversy on who the audience is. The report will be a stand-alone report BUT contents may be changed to adapt it sub-cabinet report.

Presentation: Natural Systems (NS): Bob Winfree

No PowerPoint presentation. Handout for discussion.

The Natural Systems (NS) group had eight policy options, started with about 20 research needs, then received additional input via TWGs and Alaska Forum on the environment. The list grew to 125 and was edited to 60 topics that vary in scope and detail. Nothing was a low priority, however, urgency, time frame, and importance varied.

Overarching needs:

1. Identify and research regulatory and policy issues. Identify inconsistencies in regulations and policies that affect our ability to effectively address and manage climate change impacts on natural resources.
2. Data integration. Expand data integration and collaboration to facilitate increased access to information and ensure inter-operability of multiple data management systems
3. Geo-spatial data needs. Aerial photography, digital elevation models, and remote sensing data. Currently, we cannot place where things are happening. We can't put it on accurate map.

4. Climate change monitoring. Develop a set of reliable physical and biological indicators of climate change (including species and phenology) and related community impacts, to identify the most effective ways to implement short-, mid-, and long-term status and trend monitoring across broad areas and multiple land management units. Despite the number of agencies monitoring, measuring is done in different ways/parameters, which leads to incomparable data sets. Need to identify and adopt set of common indicators. Need to make data accessible.
5. Downscaled climate models. Develop projections of future climate on a local scale for communities and land management units throughout Alaska, using scaled-down global climate model data and appropriate Alaska datasets (e.g., PRISM).
6. Boreal forest change. Research potential impacts/ramifications of the changes to boreal forests, the ecosystem services that they provide, and the wildlife, fisheries, and societal impacts of these changes.
7. Permafrost mapping and models. Identify trends and trajectories in active layer depth and permafrost zones (i.e., continuous, discontinuous), and thaw hazards, through modeling, soil surveys, and studies of permafrost degradation.
8. Expand research and monitoring of contaminants deposition and bioavailability. Include consideration of Persistent Organic Pollutants (POPs) and mercury that are produced in other areas (by wildland fire, coal burning, etc.) and precipitate in arctic environments by global air circulation

Commercial Fisheries NS-1

9. Fisheries policy considerations. Research what other countries, U.S. federal agencies and other states are doing to incorporate climate change considerations into commercial fishing policies,
10. Synthesize current information about fisheries impacts and assess its reliability and degree of uncertainty. Understand how productivity of coastal and estuarine systems may change and how it may be “repartitioned” in response to environmental changes and resource use.
11. Expand physical monitoring of seawater. Monitor and model the potential change for ocean currents, salinity, and acidification.
12. Conduct physical, biological, and socioeconomic monitoring consistently over time to understand environmental change, distribution and abundance of marine species, and societal impacts.
13. Conduct fisheries ecological modeling.
14. Arctic Ocean commercial fisheries assessments. Fisheries population shifts are likely due to ecological change, and ship access is increasing with reduced sea ice
15. Identify how individual ecosystems are changing.

16. Keep the state catalog of anadromous fish streams current.

NS-2 Wildland Fire

17. Land cover base maps. Need vegetation maps that are usually compiled from satellite imagery.
18. Fire and fuel modeling. Conduct detailed modeling (including hind- and fore-casting) of wild land fire frequency, intensity, and areas, including likely effects on principle land cover types (e.g., conifers, deciduous, grass, tundra). Modeling is needed to assess future fire dynamics under a suite of potential future climate scenarios.
19. Wild land fire effects on Greenhouse Gas (GHG) emissions. Further research on burn intensity mapping and quantification of emissions from recent fires should be completed.
20. Research fire effects on subsistence species, habitats, and society. Consider fire impacts from subsistence, historic, and TEC perspectives for holistically modeling fire effects. Urgency: Mid-term. Implementation by: UAF, ACCAP
21. Tundra fire mitigation measures. Evaluate mitigation strategies for communities in tundra-dominated ecosystems to create fuel breaks at the wild land interface (e.g., gravel perimeter road around community) to reduce risk of wild land fire spreading among structures, as well as spread of fire from communities into wild lands (e.g., escaped trash fires at dumps
22. Monitor and research tundra fire effects, including the impacts of fire on winter caribou range and changes in vegetation patterns and succession caused by fire.
23. Determine efficacy and ecological effects of different fire management policies.
24. Assess efficacy, economics, and ecological effects of wood harvesting systems, to economically produce wood biomass fuels for use in space heating applications
25. Analyze tree line changes.
26. Research ecological tipping points. Convene a working group of scientists and managers to identify key forest vegetation species (fiber and food) and determine information required to predict “tipping points” of rapid change.
27. Research and monitor vegetation response after disturbance (e.g., fire, insect, disease, logging).
28. Review and coordinate wild fire policies with Canadian counterparts.

NS-3 Watersheds and Instream Flows

29. Develop better hydrology data and models. Improve the currently available hydrology (NHD) dataset.
30. Develop water supply scenarios to better understand the broad range of impacts of climate change on fresh water quantity, flow, seasonality and quality in Alaska.
31. Assess water rights for community potable water supplies, “subsistence priority”, and water fish and wildlife habitat.

NS-4 Invasive Species

32. Identify, model, and monitor and research specific invasive species risks to native species and ecosystems due to climate-driven expansion of invasive plant, animal, disease and pest species (terrestrial, freshwater, marine - plants and animals), including potential transmission routes, trigger points, and conditions affecting establishment.
33. Assess laws and policies affecting introduction, spread, and control of invasive species.
34. Support establishment of “best methods” for preventing spread of invasive species.
35. Develop capacity for commercial production of native plants materials from local sources for revegetation projects.
36. Assess existing ballast water treatment technologies for application in Alaska.
37. Monitor distribution and spread of marine species, *Spartina*, green crabs, and invasive tunicates in Alaskan coastal waters.
38. Assess effectiveness of practices for new-roads maintenance equipment, schedules and methods in reducing the spread of invasive plant propagates.
39. Research irruptive native species effects and potential future risks from (e.g., “rocks not” diatom, bark beetles).
40. Research potential “new” and introduced species, benefits, ecological niche, and potential invasiveness.

NS-5 & NS-6 Wildlife Harvest and Adaptive Management of Wildlife

41. Monitor and forecast wildlife trends. Expand long-term monitoring to document changes and trends of abundance and distribution wildlife species, and develop criteria for triggering investigation of unexpected population changes.
42. Identify wildlife species most at risk from expected landscape changes from climate change.

43. Develop projections of future changes to potential wildlife habitat that are likely to result from climate-driven changes to landscape, land cover (vegetation), wildfire frequency and intensity, permafrost thaw, and fragmented migratory.
44. Moose: Literature review about effects of temperature on rut timing and the potential effect of allowing moose hunting during the rut on productivity of moose.
45. Caribou: Evaluate reliability of conducting post-calving photo census of caribou herds and alternate methods for assessing population abundance.
46. Assess effects of climate on harvest access.
47. Populations and harvest rates data is needed in order to assess changes to laws, policies, and regulations (need more individual surveys).
48. Assess disjoints between calendar dates for legal harvest, and actual biological behavior of species.

NS-7 Forestry and Wood Biomass

49. Develop protocols for certifying carbon storage and sequestration rates for boreal and coastal forests. The concept that wood fuels are carbon neutral should be thoroughly examined.
50. Harvesting dead wood. Support research in new harvesting equipment or application and adaptation of current equipment.
51. Air quality monitoring and testing of various wood burning appliances should be completed in an arctic environment.
52. Determine ecological effects of salvage logging (e.g., biomass, nutrient, and habitat removal, effects to soil, permafrost, and invasive species).

NS-8 Local Agriculture

53. Agricultural products research. Research and develop new agricultural products, technologies, and best practices to adapt effectively to changing climatic conditions, including agricultural opportunities for small and remote communities

Cross Cutting-1 and -2

54. Scenario planning. Develop needed data and interpretive products, and implement local climate change scenario planning workshops in communities across Alaska (coastal, arctic, interior, etc.).

55. Assess communications strategies. Determine the most effective information sources for communities to receive information about climate change. Avoid counterproductive “scary” information, as was the case for some information about avian influenza.

Research and Information Needs Covered by Others?

56. Conduct baseline characterization of Alaska’s coastal shoreline and coastal resources (e.g., NOAA ShoreZone, geomorphology, biology, cultural sites). Baseline data is needed to enable coastal impact forecasting, scenario planning, monitoring, trend analysis, and spill response following shipping accidents, which are expected to increase as sea ice diminishes in the Northwest Passage.

57. Project, map and monitor coastal erosion impacts in the context of sea level rise, coastal uplift, reduced sea ice, subsidence from permafrost thaw, tides, storms, short-term (El Nino-type) components.

58. Increase monitoring of coastal erosion and storm impacts.

59. Increase real-time monitoring and forecasts of ocean conditions (winds, waves, sea ice, currents, temperature, salinity, pH, etc.).

60. Greenhouse gas emissions models. Estimate and research net contribution to greenhouse gases (+ or -) to determine where Alaska lands and waters function as carbon sinks (e.g., forests) or sources (e.g., permafrost thaw, wildfire).

61. Hazards identification and assessments. Identify and research specific hazards, mitigation measures, and response capacity needed for dealing with effects of rapid climate changes.

62. Map geothermal potential for mitigation (energy).

63. Update Environmental Atlas of Alaska and Engineering Design Data System.

Comment: There is overlap and duplication in the submitted materials.

Request that NS1 be changed to just ‘Fisheries’.

Question: Is it likely to review all existing regulations? Answer, Yes, if we push it. Policies need to be clarified before appropriations can be designated.

Not all regulations need to be reviewed ASAP, key ones first. Is Alaska a place to sell land as value in cap and trade, or are tundra fires putting more carbon? Change in use of land that sequesters carbon—some lands may not be eligible.

Need missed: ecosystem monitoring should be comprehensive.

Adaptation is necessary: climate will change natural systems.

Need to envision what will be measure of success of management in future.

Recommendation: Change NS list by priority.

Lunch Discussion about report

The Feb 26 thoughts about the report were reviewed for the benefit of the group.

Group reviewed NPRB layout as well as materials (table) provided by Co-chair, Clint Adler.

Comments and recommendations:

- Clarification sought on systems approach definition
- A summary approach, like the table does not present recommendations on climate change in significant detail.
- It seems that the table contents reads more like a preamble or a framework for resolution. It's principle-driven.
- Group agreed that this format and the contents would be used to structure a preamble to the report
- One possible structure is the preamble followed by the research needs.
- Should the report include detail information on implementing agency?
- Discussion over pros and cons, group decided that the key agencies would self-identify based on funding and capacity if the function on the implementing agency/leaders is articulated. Pointing out particular agencies could seem like forcing agencies and excluding other potential implementers.
- Recommend an opening statement, followed by necessary steps to achieve research needs recommendations and executive summary. Should report be in Adaptation and Mitigation sections.
- Prioritization question: is the RNWG prioritizing amongst TWGS? Answer: No. Only recommendations within topics. Reminder that the report has to be able to stand-alone.
- Comment that the RNWG would be missing an opportunity if we it didn't look at full scale of research and pull out subset to highlight—the RNWG should use best judgment to put recommendation forward, and be ready to defend the recommendations.
- There seems to be a convergence of topics on planning process
- Need to address levels of uncertainty
- Recommend decision-making tools, linking to economy
- Recommend various levels depending on urgency, and what can be done when
- Would cross-cutting needs be first?
- Is it time to have climate change czar—do we want a state climate center?
 - Dependent on National Climate Center coming

- Czar position—because of economics associated w cap/trade—need for an appointed representative of the Governor to be present
- Czar position should be housed where it would be most effective
- Integrate research among multiple authorities
- Government could serve a coordination function
- Consider the federal activity via new Administration, Stimulus package, coming to Alaska
- Draft priorities based on grid
- Discussion on document mapping, formats, presentation and policy statement – needed for rationale

Presentation: Economic: Doug Vincent-Lang

PowerPoint Presentation: RNWGEconomicActivitiesFeb17.pdf

Slide 2: EA TWG is developing policy recommendations to address the effects of climate change on a wide range of economic activities across Alaska.

Slide 3: 5 options/recommendations:

- Evaluate potential needs for expanded ocean oversight and regulatory activities
- Explore economic activity opportunities offered by climate change
- Develop scenarios for the Alaska economy affected by climate change
- Establish a center for knowledge sharing on Arctic issues
- Improve availability of mapping, surveying, charting, and imagery data.

Slide 3: Research needs/objectives:

- Develop higher resolution climate modeling and monitoring data and improve its accessibility.
- Assess statutory, regulatory, and policy frameworks and barriers to implementing climate change policy recommendations.
- Assess economic impacts of market-based approaches (e.g., cap and trade) to manage GHG emissions and their impacts on the Alaskan economy.
- Assess data and information (economic indicators) needed to develop short and long term planning tools to assess impacts of climate change on economic activities.
- Implement adaptive (scenario-based) planning tools that integrate economic indicators to improve climate change mitigation and adaptation decision-making and implementation
- Systematically identify and address economic barriers to implementing climate change planning efforts.
- Catalog and assess new or expanded economic opportunities that may become available with climate change.

Concern: Is there enough data to bring in equity/capital, such as insurance cost, out there?

Boundaries in Alaska are very important--changing boundaries, is there research on establishing new and exist boundaries?

State is still in very reactive mode, even more so now- w changing federal landscape.

Need: state assistance for economic opportunities and liabilities, incentives in carbon sequestration or renewables? Some of the research needs in the NS group could be transferred to the EA group.

Economic questions apply to various industries/sector. In addition there are also issues of permits as economic barriers: FERC, NEPA.

Evolving jobs and economy— ought to be mentioned anywhere there is discussion on opportunities for University system, training, and curriculum.

Need to understand organizations interests/involved to leverage and maximize resources. Amy Holman putting together framework: what are the organizations working on climate change that would fit in NOAA's National Climate Service, that should be addresses in this report.

Presentation: Forestry, Agriculture & Waste: Chris Maisch

No PowerPoint Presentation

The presentation of the FAW topics addressed the options submitted as inter-related facets. The options were the following:

1. Issue: In an arctic climate these wood burning appliances need testing for PM and other emissions to ensure public health is not negatively impacted.

What is the research need? Demonstrate that modern wood combustion appliances, such as wood pellet stoves, boilers and larger scale facilities meet EPA particulate matter (PM) standards.

Describe the scope of the research need: There are several different scales to address, from individual home appliances, to mid-size boilers for larger public facilities, such as schools. There may also be a need to look at co-firing uses, such as electric utilities.

Policy Option or recommendation: FAW-2, Allay concerns that wood burning has detrimental health impacts

What research is being done/known? Cold Climate Housing Research Center in Fairbanks is doing some testing in conjunction with the FNSB. The military did some emission tests on co-firing with wood chips and coal at Fort Wainwright

Parties involved in implementation: EPA and local governments -joint efforts by private and public sector. Stove manufacturers, wood fuel manufactures, CCHRC and local government, EPA

2. Issue: Carbon trading under a cap and trade system requires verification of carbon additionally above a baseline reference. This "additional" Carbon can be sold as part of a mitigation strategy

for a Carbon producer that needs to exceed their cap. Silvicultural treatments need rigorous third party review to ensure they meet the needs of the market.

What is the research need? To develop a protocol for determining carbon sequestration rates, additionally for silvicultural treatments in boreal and coastal forests.

Describe the scope of the research need: Coastal and boreal forests need work completed on this topic. -Should look at both above ground biomass and soil biomass and Carbon pools

Policy Option or recommendation: FAW-1, Establish a carbon accounting system for forestry practices

What research is being done/known? There is work being done in this arena, but not specifically related to silviculture treatments in these ecosystems. Modeling will play a role, but protocols for developing baseline and Carbon accounting over time need more attention

What are the gaps in research: Soil dynamics are not well understood.

Parties involved in implementation: State and federal forest management agencies and private landowners that undertake active forest management practices. i.e.: native corporations, U.A. land trust, mental health trust. Carbon certification organizations, SFC, SFI? Carbon exchanges and traders. Multi-stakeholder effort that should include institutions currently studying this topic.

3. Issue: Currently in most models that model carbon flux between sinks and sources there is no allocation made for C storage as a tree moves from a log to a forest product. When the tree is harvested from the forest, it is treated as an emission. This is a simplification that is not accurate in the real world use of wood. This is also an issue when you discuss product substitution. Using wood instead of steel, concrete or other building products that have much higher Carbon footprints than wood.

What is the research need? Development of a protocol that assigns a carbon life to different types of wood products. Determine the carbon life of durable wood products

Describe the scope of the research need:

~ A national or international standard needs developed so that the Carbon market has the ability to certify and verify amounts of Carbon stored by wood products

~ Carbon budgets need developed for different types of building materials to accurately portray the gain or loss of Carbon based on the type of product used as compared to wood products. - This may vary by wood species or groups of species or by hardwood/softwood

Policy Option or recommendation: FAW-1

What research is being done/known?: Some discussions are occurring on this topic, but a review of current thinking and efforts underway to better define and address item would be a good first step. Literature review.

What are the gaps in research: Complete literature review to identify gaps

Parties involved in implementation: Wood product manufacturing businesses, state and federal forest management agencies and private land owners, Alaska Forest Association, other. National or state level review of issue

4. Issue: Currently woody biomass is considered a carbon neutral fuel when compared to fossil fuels, such as coal, oil or natural gas. The combustion of all fuels produces CO₂, but trees that are harvested for this purpose are replaced by new trees that sequester Carbon from the atmosphere. Over time, the CO₂ released by the combustion process will be captured again by the new tree crop. This concept is important because in the carbon trading market place, an offset credit can be generated by using a biomass fuel for a fossil fuel. It is a straightforward calculation to determine how much Carbon is in a gallon of fuel oil or ton of coal and when you "offset" this fuel type with biomass you generate a credit that can be sold.

What is the research need? Determine if woody biomass used in energy production is a carbon neutral fuel source, Scientifically demonstrate that woody biomass used as a fuel for energy is a carbon neutral fuel

Describe the scope of the research need: Scope is pretty narrow, need to demonstrate that this concept is valid or if not fully neutral by what percentage is it a Carbon neutral fuel?

Policy Option or recommendation: FAW-2

What research is being done/known? Not aware of any, would benefit from a literature review

What are the gaps in research: Not sure, it seems like a pretty straightforward problem that could be answered with current inventory and data. Needs re-worked from a C perspective.

Comment: How do you ensure that forest matures – is there enough change on climate that it matures. Offset – in carbon trading – credit that you can trade.

Need for applied research—a faster growing tree will capture more carbon more quickly.

In pulp/paper—pesticides, fertilizers – would have to supplement earth

Is wood neutral = Carbon neutral?

Standard protocols need standardization.

Develop protocol for carbon sequestration rate-- storage, life of tree.

Reforestation after fire—need process and budget

Two parts: age of trees, how much is sequestered, how do we know if boreal fires not sink—releases Mmt carbon—but if you reforest you would be capturing more carbon. There is work among different scientific entities that needs to come together to design models: boreal and coastal

Concerns of wood burning and health – particulate problem w wood smoke. CCHRC –quantifying for differences of wood burning in arctic.

Do we know impact of pellets? Two parts—carbon footprint? Type of fuel. Particulate standards – additional work needs to be done

Comment that the TWG appeared to be focused on forestry—are there opportunities in agriculture? Generation of biofuels?

Need to look at food source vs. non food source debate.

Switchgrass—some work going on at UAF. Not native to AK. When is an external crop a benefit, when is it invasive?

Did TWG look at transportation cost for agriculture—mitigating cost? Need to look at carbon footprint of imports, can state afford carbon? footprint of imports

Waste management was not addressed, what can we do to mitigate its impact?

Comment: in Anchorage process of capping methane and reuse as fuel, in Anchorage, this will be cost-effective. Not in other places in Alaska.

DOT has played w woodchips as runway – look into forest waste for building infrastructure. Example: Fairbanks road.

Need to look at migration of boreal; change in fire season and particulate matter affecting air quality.

Is there opportunity for Alaska to produce bio-jet fuel?

Report Format:

Suggestion that report is color-coded for cross-cutting and overarching sections

Suggestion: Lay out TWG mission, summary/overarching research needs associated with options provided, other options, then follow with identified additional detailed research needs

The process of prioritizing the options within topics has been tabled for now, until the group has a chance to develop and adapt standards and process.

Next steps:

By March 19 Research Information Coordinators should send a summary of the recommendations, process, players to Indra@iialaska who will compile and distribute back to RNWG in prep for the April 9, 2009