State of Alaska

Governor's Climate Change Sub-Cabinet

Stakeholder Process

Forestry, Agriculture and Waste Technical Working Group (FAW TWG)

Alaska Forum on the Environment

February 2 – 6, 2009

Moderator: Luke Hopkins, Fairbanks North Star Borough Assembly

Ron Wolfe, Sealaska Corporation

Chris Maisch, Division of Forestry

Donna Mears, Municipality of Anchorage

ALASKA Department of Environmental Conservation

Members of the Forestry, Agriculture and Waste Management Technical Work Group

- Forestry: Ron Wolfe, Rick Rogers
- Waste/Landfill: Steve Gilbert, Donna Mears, Jeff Riley
- Agriculture: Charles Knight
- State Agency Expertise: Chris Maisch, Doug Buteyn
- Coordinators: Brade Strode and Steve Roe

Focus: Technical support to the Mitigation Advisory Group (MAG)

- Review and approval of a current and comprehensive inventory and forecast of greenhouse gas (GHG) emissions in Alaska from 1990 to 2020;

- Development and recommendation of a comprehensive set of specific policy recommendations and associated analyses to reduce GHG emissions and enhance energy and economic policy in Alaska by 2020 and beyond;

- Development and recommendation of a set of recommended statewide GHG reduction goals and targets for implementation of these actions;

TWG Stepwise Planning Process

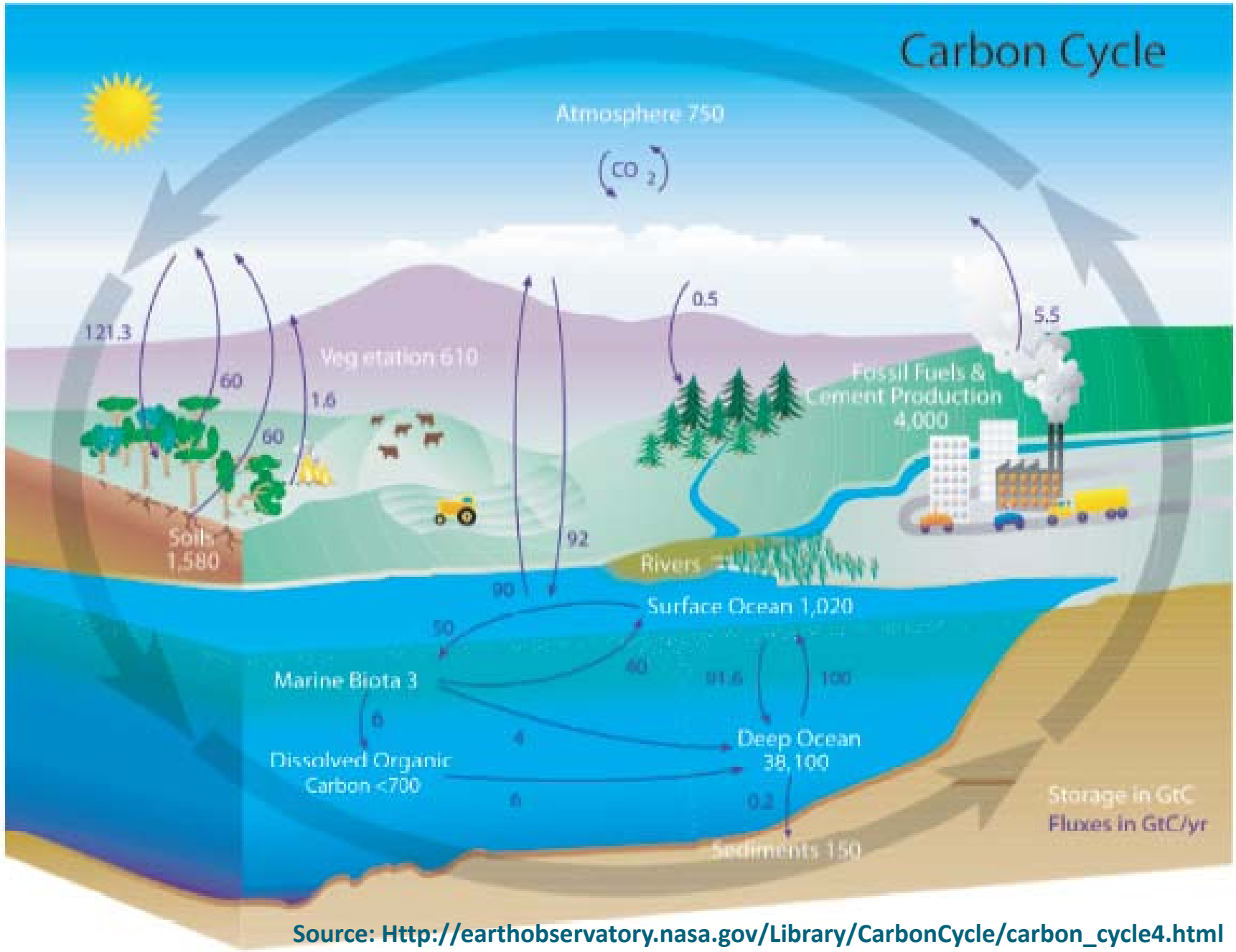
1. Develop inventory and forecast of emissions
2. Identify a full range of possible actions
3 Identify initial priorities for analysis
4. Develop straw proposals
5. Quantify GHG reductions and costs/savings
6. Evaluate externalities, feasibility issues
7. Develop alternatives to address barriers
8. Aggregate results
9. Iterate to final agreements
10 Finalize and report recommendations

Conclusions for Forestry (FAW-1) and Biomass (FAW-2)

- Forest management can play an important role in enhancing the conservation and storage of carbon pools
- The coastal temperate rain forest is a large carbon sink
- The boreal forest under the influence of fire can be a net emitter of carbon, especially in areas of permafrost rich soils
- Management practice can influence the dynamic between source or sink

Conclusions for Forestry (FAW-1) and Biomass (FAW-2)

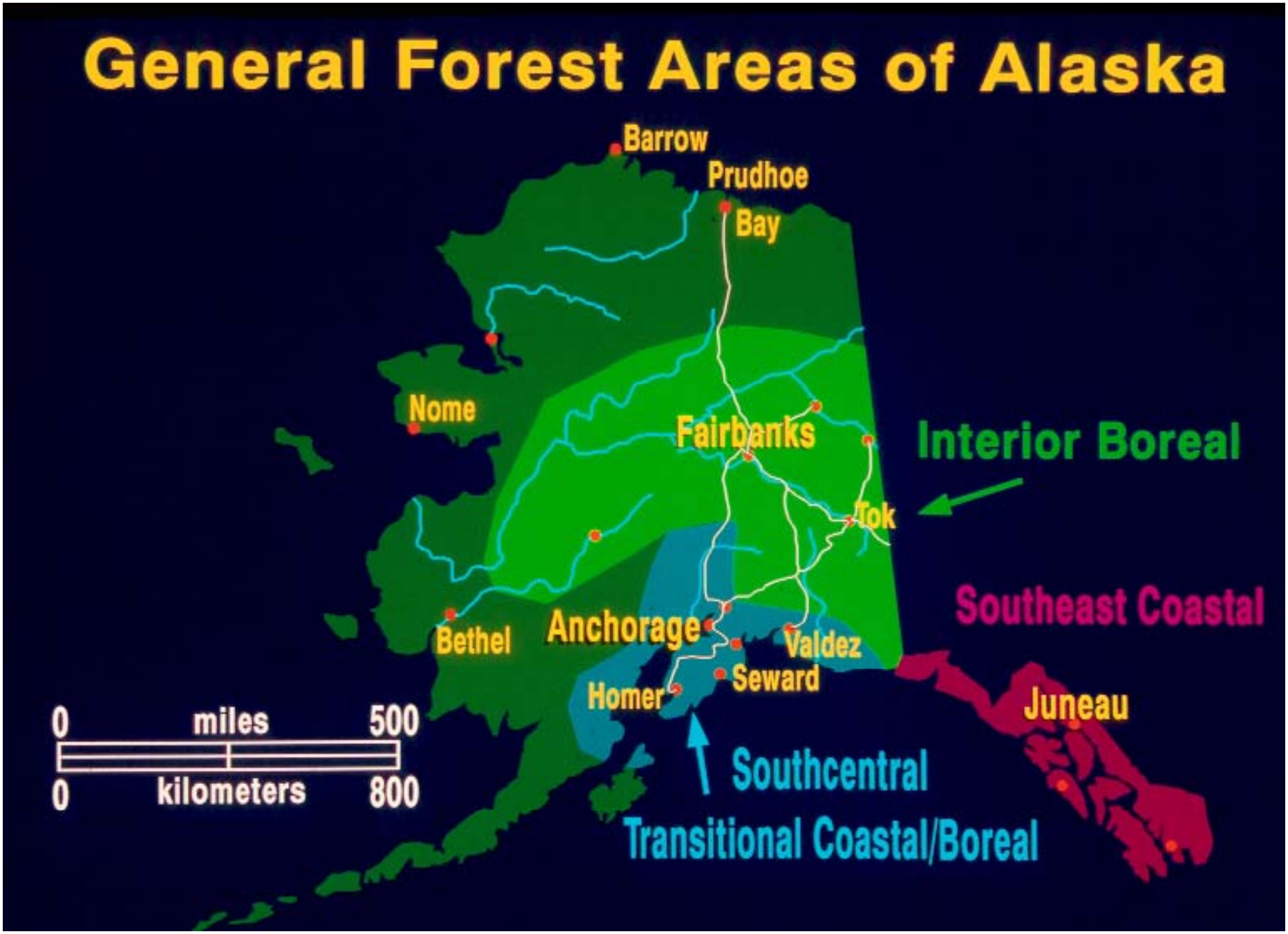
- Utilization of woody biomass for energy production has many benefits in addition to being considered a carbon neutral fuel source
- Offset credits generated by replacing fossil fuel with biomass can be sold in the carbon market (CCX)
- Opportunities exist at a variety of scales from individual homes to large industrial application



Source: Http://earthobservatory.nasa.gov/Library/CarbonCycle/carbon_cycle4.html

Option FAW-1. Forest Management for Carbon Sequestration

- Alaska forests can play a unique role in both preventing and reducing GHG emissions
- Provide social and environmental benefits
- The state has two distinct forest ecosystems
  - Boreal Forest
  - Coastal forest
- Forest management for carbon may differ


General Forest Areas of Alaska
Barrow
Prudhoe
Bay
Nome
Fairbanks
Interior Boreal
Tok
Southeast Coastal
Bethel
Anchorage
Valdez
Seward
Homer
Juneau
0
miles
500
0
kilometers
800
Southcentral
Transitional Coastal/Boreal

Role of Fire: Important Difference in the Boreal Forest

Option FAW-1. Forest Management for Carbon Sequestration

- Coastal forests - Promote additional carbon durable products through enhanced management
  - extended rotations
  - pre-commercial or commercial thinning
  - fertilization treatments
  - other silviculture treatments
- Boreal forests
  - fuel reduction
  - completion of Community Wildfire Protection Plans
  - reforestation of sites impacted by fire, insect, or disease

Reforestation

- Individual in urban environment

Large Scale Reforestation After Fire or Insect and Disease Outbreaks

FAW-1 Research Needs

- Carbon baseline calculations
- Methodologies to determine carbon additionality
- Carbon Life Cycle Accounting for:
  - Carbon durable forest products
  - on site carbon sequestration and migration
- Substitution credit for carbon durable products

Durable Goods Store Carbon

Turned House Logs

Tongue and Groove Lumber

Option FAW-2. Biomass Feedstocks for Energy Production

- Displace the use of fossil energy sources
- Increase forestry, municipal solid waste, and agriculture biomass
- Generate:
  - Heat
  - Electricity
  - liquid/gaseous biofuels
  - Local year-round food production

50 kw unit price:
$300-500K installed
2 Ton per day @ 15% moisture
4 Tons per day green
Up and running in
Less than 6 months

Easy to fulfill feedstock requirements.

A system designed to take run at 50% of a systems max capacity can offset 90% of the fuel used

BioMax Power System

Electricity - Heat - Shaft Power

From Wood Scraps, Forest and Agricultural Residues

An Innovative Bioenergy Power System From Community Power Corporation

Features

- Fully automatic startup, operation & shutdown
- Microprocessor-based control system
- Co-Gen (CHP) Power modules
- Non-condensing system, Dry gas clean-up
- No liquid effluents, No toxic wastes
- Combined heat and power
- Can use variety of woody biomass fuels (wood chips, pellets & scraps, nut shells,etc.)
- Optional automatic dryer/feeder
- Designed for high volume, low cost manufacture
- Trailer or skid mounted, simple installation

Specifications

- Electrical Power: 5 to 50 kWe modules
- Thermal Power: ~50k-500k Btu/h
- Footprint: 5m x 5m
- Weight: ~ 1,500 kg
- Gas: LHV 5mj/m^3 <5ppm Tars/Particulates
- Fuel Conversion: ~1.5kg of wood per kWhe
- Dispatchable power within 30 seconds
- Full cold startup on wood gas: ~15 minutes
- Turndown ratio: > 10:1
- Gas composition (~): O_2 0%, H_2 20% CO 20%, CO_2 7%, CH_4 2%, balance is N_2
- Startup/Backup fuel: LPG, propane, butane

Community Power Corporation
Energy Systems for Sustainable Power

6420 S. Continental Divide Road
Littleton, Colorado 80127
Tel: (303) 933-3135
Fax: (303) 933-1497
Email: rwalt@gocpc.com (Robb Walt, President)
Web: www.gocpc.com

RUF GmbH & Co KG www.Briquetting.com
BioPellet Heating Systems LLC www.BioPellet.net

Energy Cost Comparison:

Fuel oil @ $4/gallon = $29 per MMBTU

RUF Briquettes @ $250 per ton = $16.9 per MMBTU

Fuel Oil Costs 1.7 times more!

FAW-2 Needs and Benefits

- Develop
  - Conventional technologies
  - Emerging technologies
  - Methods to economically utilize biomass feedstocks
- Increase resiliency and competitiveness of regional sawmills
- Create jobs and stimulate secondary manufacturing of wood products
- Make forest restoration more economically viable
- Scale industry appropriately

Utilization of Logging Slash

Additional Information

- Forest Management Solutions for Mitigating Climate Change in the United States, published by the Journal of Forestry, April/May 2008

http://www.safnet.org/jof_cctf.pdf

Option FAW-3. Advanced Waste Reduction and Recycling

- Limit GHG emissions upstream through reduction in waste generation. GHG production can be attributed to:
  - Material production
  - Transportation
- Limit GHG emissions downstream through recycling and local materials processing. GHG production can be attributed to:
  - Raw material extraction
    (recycled feedstock has lower footprint than raw materials)
  - Reduction in methane generation in landfills

Needs FAW-3

- Quantify state-wide waste generation and recycling rates and establish tracking mechanism
- State-wide coordination for outreach, education, program development and community support
- Support existing and develop new in-state infrastructure including collection, processing & markets – must be economically sustainable
- Increase average participation and recovery rates for all recycling programs

Thank you!

Your Input is Welcome!

You may follow the progress of the FAW TWG
and
the Advisory Group, or provide comments by visiting :

http://climatechange.alaska.gov/

Your input may also be submitted on
Comment Sheets available here at the AFE