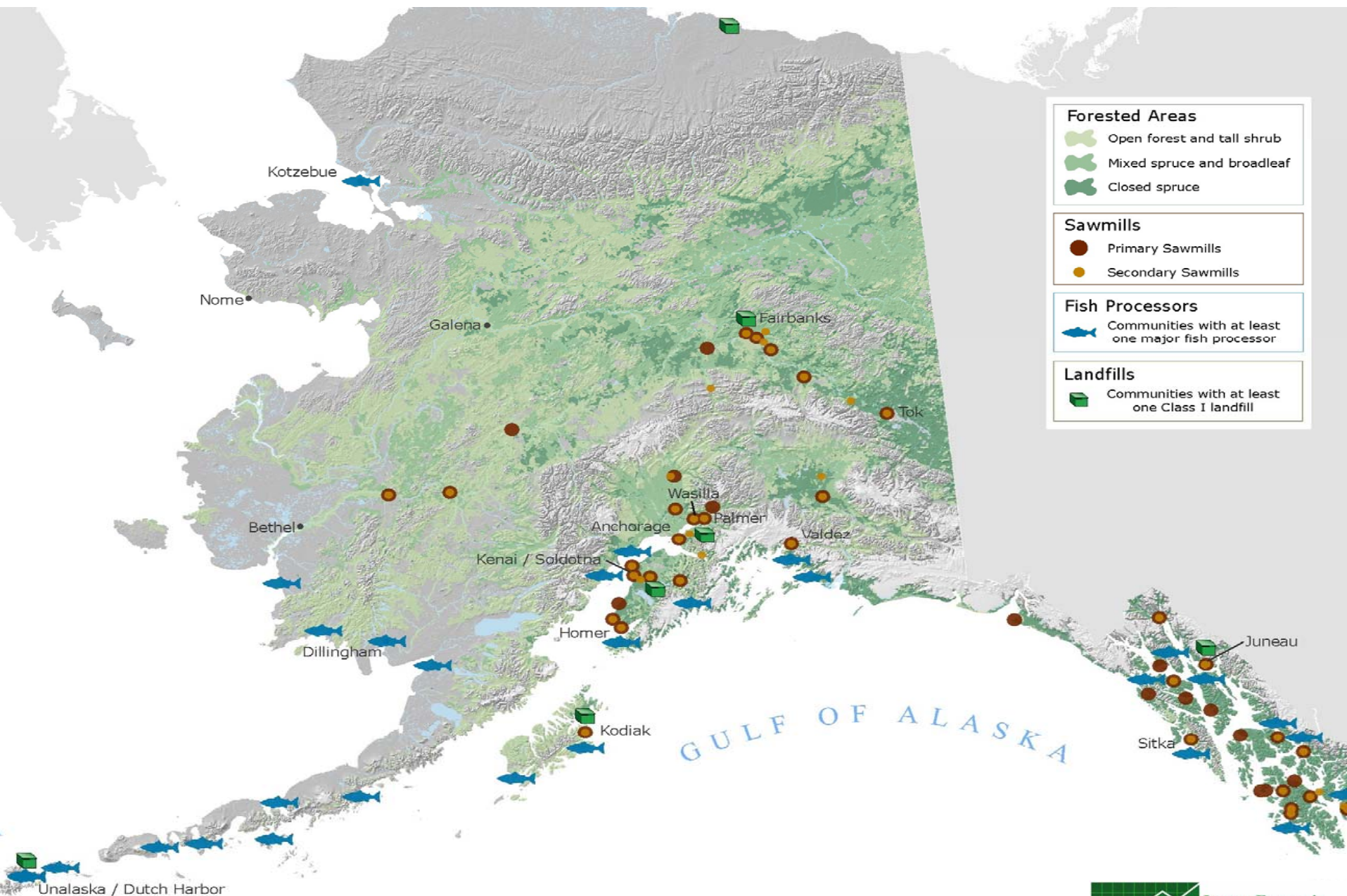


Wood Energy Opportunities For Alaska

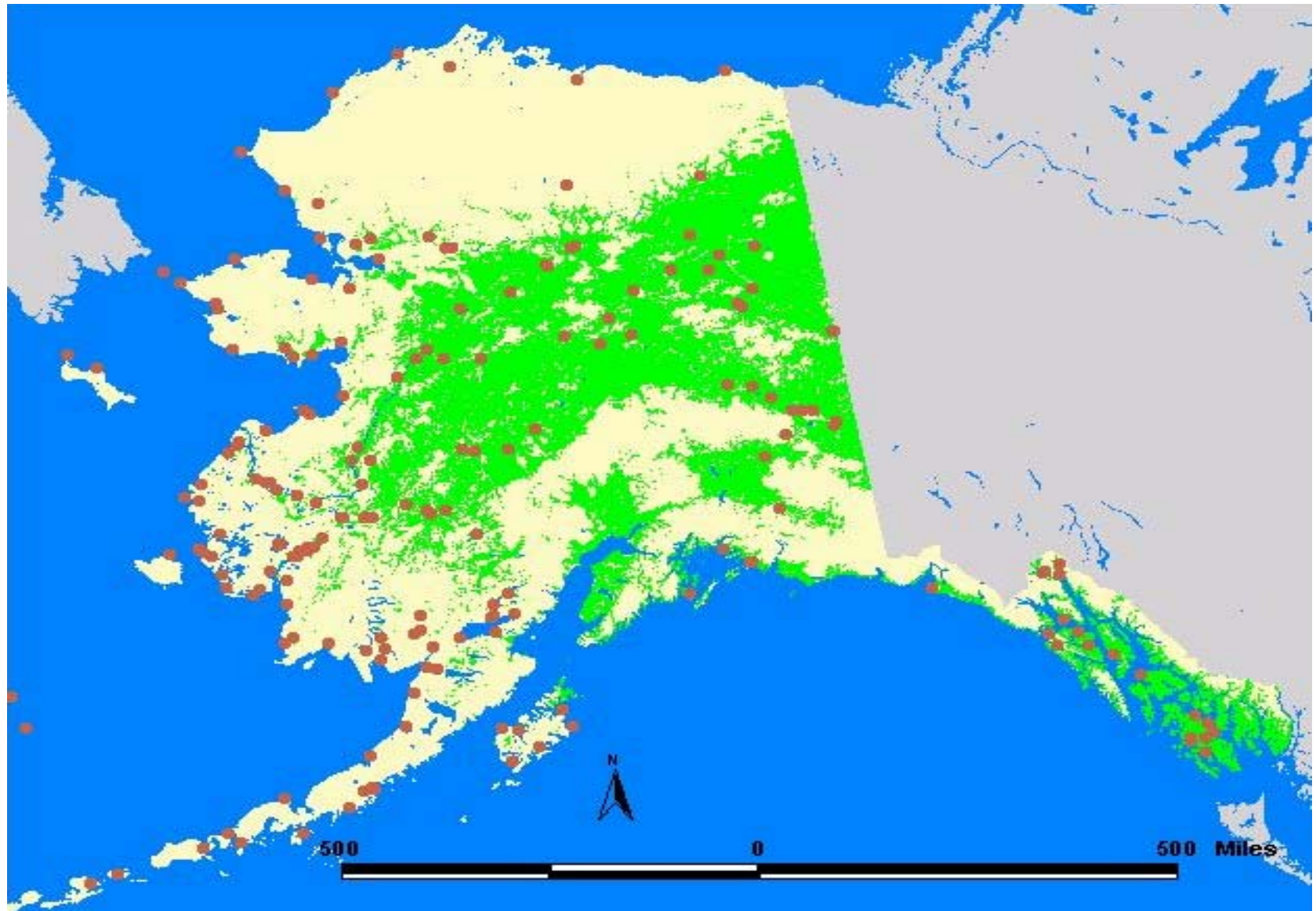
Southeast Conference Annual Meeting
September 19-21, 2006
Ketchikan, AK

Daniel J. Parrent
Juneau Economic Development Council

Distribution of Alaska Biomass Resources



Distribution of Alaska Communities and Forest Resources



Alaska Wood Energy Development Task Group

Coalition of 13 local, state and federal agencies and organizations*

Alaska Energy Authority and USDA Forest Service are lead agencies; provide expertise and bulk of funding

JEDC / WPDS provides primary “point of contact”, resource information and technical assistance

* Alaska Energy Authority, USDA Forest Service Region 10, Juneau Economic Development Council, Alaska Village Initiatives, Denali Commission, Alaska DNR Division of Forestry, USDAFS PNW Wood Utilization Center, USDA Farm Services Agency, USDA Natural Resources Conservation Service, USDA Rural Development, USDOE National Renewable Energy Lab, USDI Bureau of Indian Affairs, USDI Bureau of Land Management, UAF Cooperative Extension Service

Alaska Wood Energy Development Task Group

AWEDTG Goals:

1. Assist Alaska facility operators decrease heating costs
2. Expand opportunities to displace petroleum-based fuels with local, under-utilized wood resources, namely:

High-hazard Forest Fuels



Dead and Diseased Trees



Sawmill By-products

Bark and sawdust



Slabs and Edgings

Alaska Wood Energy Development Task Group

AWEDTG Program Implementation:

Solicited Statements of Interest from public and not-for-profit facilities statewide in 2005 and 2006; received 35; selected 22 for further study

2005 - Conducted 5 feasibility studies for projects in Craig, Thorne Bay, Delta Junction and Venetie (report available at www.jedc.org)

2005 – Provided financial and technical assistance to the City of Craig for their wood-fueled heating system

2006 – Seventeen feasibility studies underway for projects in Haines, Tetlin, Northway, Tok, Mentasta, Chistochina, Gakona, Copper Center, Kenny Lake, Tanacross, Dot Lake, Fairbanks, Tanana, Kokhanok, Elim, Aniak and Klawock

2007 – Move selected projects into the design / build phase

Wood Energy Technologies

Small Scale Applications (500 to 2,000 gpy equivalent):

Wood Stoves, Pellet Stoves, Pellet Furnaces

Medium Sized Applications (2,000 to 20,000 gpy equivalent):

High-efficiency, low-emission (HELE) units:

Manual “stick-feed” boilers with thermal storage

Small-scale biomass gasifiers

Large Scale Applications (more than 20,000 gpy equivalent):

Commercial/industrial hog fuel/wood chip boilers

FUEL FACTS

Fuel Oil (#2)

	Btu/gal (gross)	Conv. Efficiency	Btu/gal (net)	Price per gal	\$ per million Btu
1 gallon	138,500	85 %	117,725	2.00	16.99
				2.50	21.24
				3.00	25.48

Cordwood (20% moisture content, green weight basis)

	Btu/cd (HHV)	Btu/cd (GHV)	Conv. Efficiency	Btu/cd (NHV)	Price per cord	\$ per million Btu
1 cord	13,400,000	11,560,000	70 %	8,092,000	100	12.36
					150	18.54
					200	24.72

Hog fuel/chips (50% moisture content, green weight basis)

	Btu/ton (HHV)	Btu/ton (GHV)	Conv. Efficiency	Btu/ton (NHV)	Price per ton	\$ per million Btu
1 ton	8,200,000	6,006,000	70 %	4,204,200	25	5.95
					35	8.33
					45	10.70

FUEL COMPARISONS

Fuel Oil (#2) versus Wood Fuels

Fuel Oil Price (\$/gal)	Cordwood Equivalents		Hog fuel/chip Equivalents	
	Gallons per Cord	Eq. Value per Cord (\$)	Gallons per Ton	Eq. Value per Ton (\$)
2.00	68.7	137.40	35.7	71.40
2.50		171.75		89.25
3.00		206.10		107.10

Fuel Oil Heating Value (NHV) = 117,725 Btu/gal (85% CE)

Cordwood Heating Value (NHV) = 8,092,000 Btu/cord (20% MC, 70% CE)

Hog fuel/chip Heating Value (NHV) = 4,204,200 Btu/ton (50% MC, 70% CE)

1 cord of wood (20% MC) is equivalent to 68.7 gallons of fuel oil (#2)

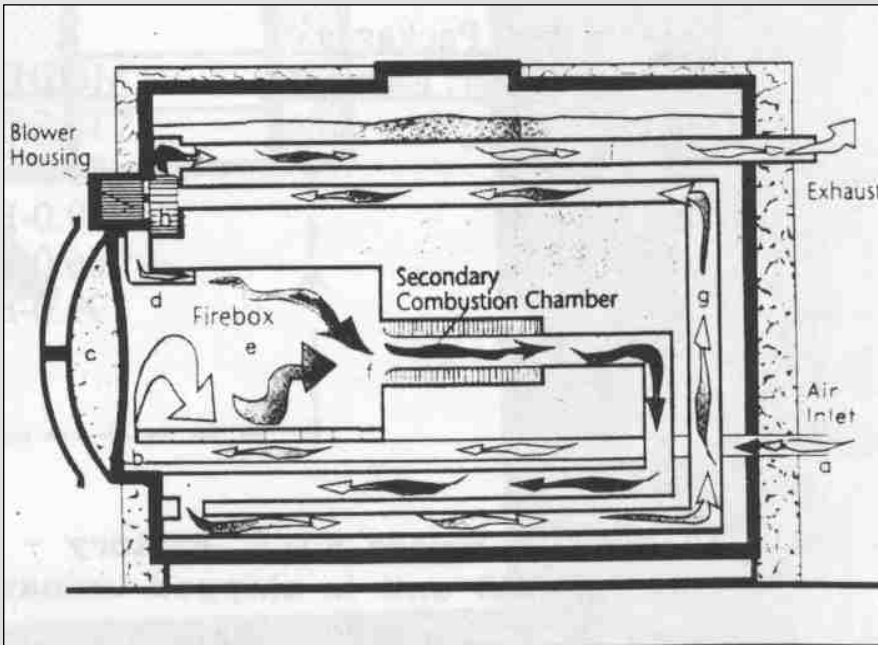
1 ton hog fuel/chips (50% MC) is equivalent to 35.7 gallons of fuel oil (#2)

Dot Lake, AK Installation

Garn 3200/4400 by Dectra Corp.

Provides supplemental heat to 10 homes and washeteria

Displaces 50% of fuel oil consumption



Dot Lake Economics

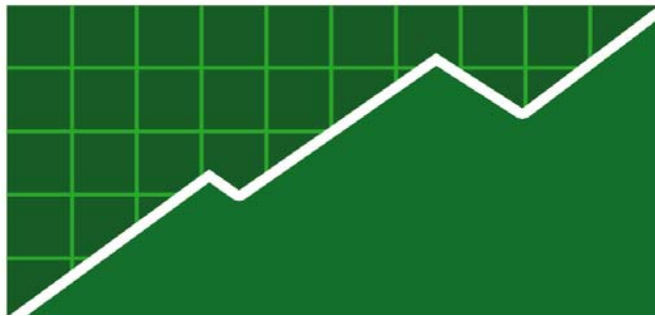
GARN 3200/4400 capital costs \$66,000

Fuel Oil System Operation & Maintenance (annual)

Labor & Materials	\$ 1,000
Fuel (7,750 gallons @ \$2.50)	\$19,375
Total	\$20,375

Wood-fired System Operation & Maintenance

	At 50% oil replacement	At 100% oil replacement
Labor	\$ 1,330	\$ 2,660
Fuel (sawmill slabwood, \$35/cd)	\$ 1,960 (56 cds)	\$ 3,920 (112 cds)
Maintenance	\$ 812	\$ 1,624
Total	\$ 4,102	\$ 8,204
Annual Savings	\$ 6,086	\$ 12,171
Payback (Simple), years	10.84	5.42



Juneau Economic Development Council

Wood Products Development Service

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Our mission is to help foster diversification and growth within Alaska's emerging value-added wood products industry, thereby expanding the State's economy, improving the utilization of forest resources, and retaining and creating jobs.