

Wind Energy Development In the Aleutian Pribilof Islands

“The Birthplace of the Wind”

USDOE/Tribal Energy Projects Review

October 2006

By Connie Fredenberg

Aleutian Pribilof Islands Association

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Anchorage, AK 99501



PROJECT STATUS

Phase	Met Tower Status	Data Collection	Feasibility Study Status	Funding Status	Construction Planned
Sand Point TDX Power	Installed 5/04	Complete 20 mph	Complete	AEA \$1.47 million Additional ?	Summer '07
St. George City of St. George	Installed 8/04	Complete 21.5 mph	Complete	?	?
King Cove City of King Cove	Installed 5/05 To be moved winter 2006	Site 1 Report in Progress	Ongoing due to location change	?	?
False Pass City of False Pass	Installed 5/05 To be moved winter 2006	Site 1 Report in Progress	Ongoing due to location change	?	?
Nikolski Nikolski IRA/TDX Power	Installed 12/05	Ongoing	Expect to be completed 12/06	USDA/RUS \$474,475 APICDA/ Green Tags \$200,000?	Summer '07

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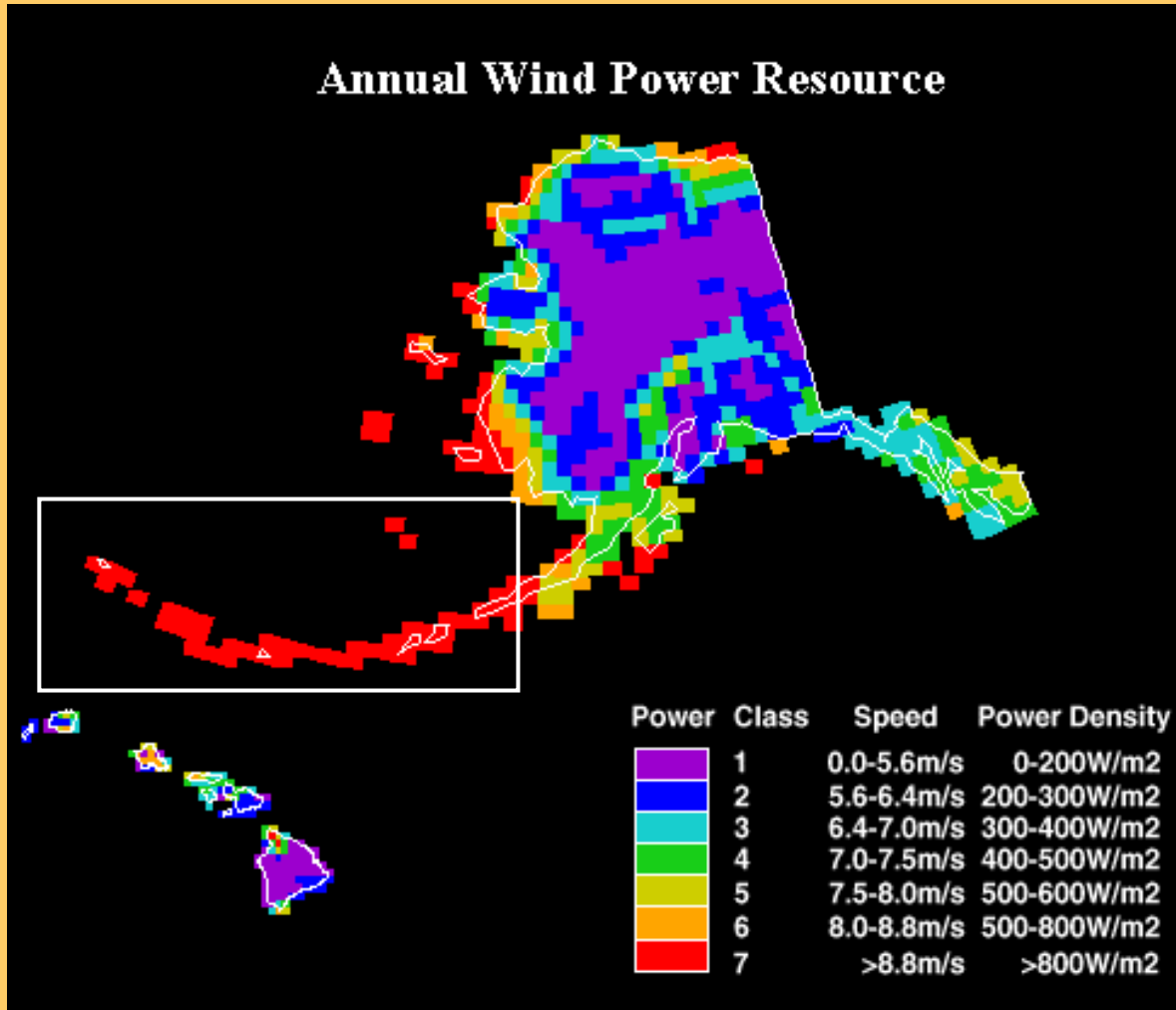


- Anchorage to Nikolski is 900 air miles for \$1,316 (off-season price)
- It is \$942 from Anchorage to St. George.
- To fly from St. George to St. Paul – a distance of 40 miles – you have to go through Anchorage.

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World Class Wind: A Mixed Blessing



- 150 mph gusts
- Extreme Turbulence Potential
- Corrosive Salt Spray

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**Millions of Migratory Birds
Visit the Region annually**

**The World's Largest Breeding
Colony of Red-legged
Kittiwakes - St. George Island**



Endangered Eiders

Molt and over-winter around many islands

APIA works with local hunters, bird watchers, students, USFWS and power plant operators to prevent and monitor avian interaction.

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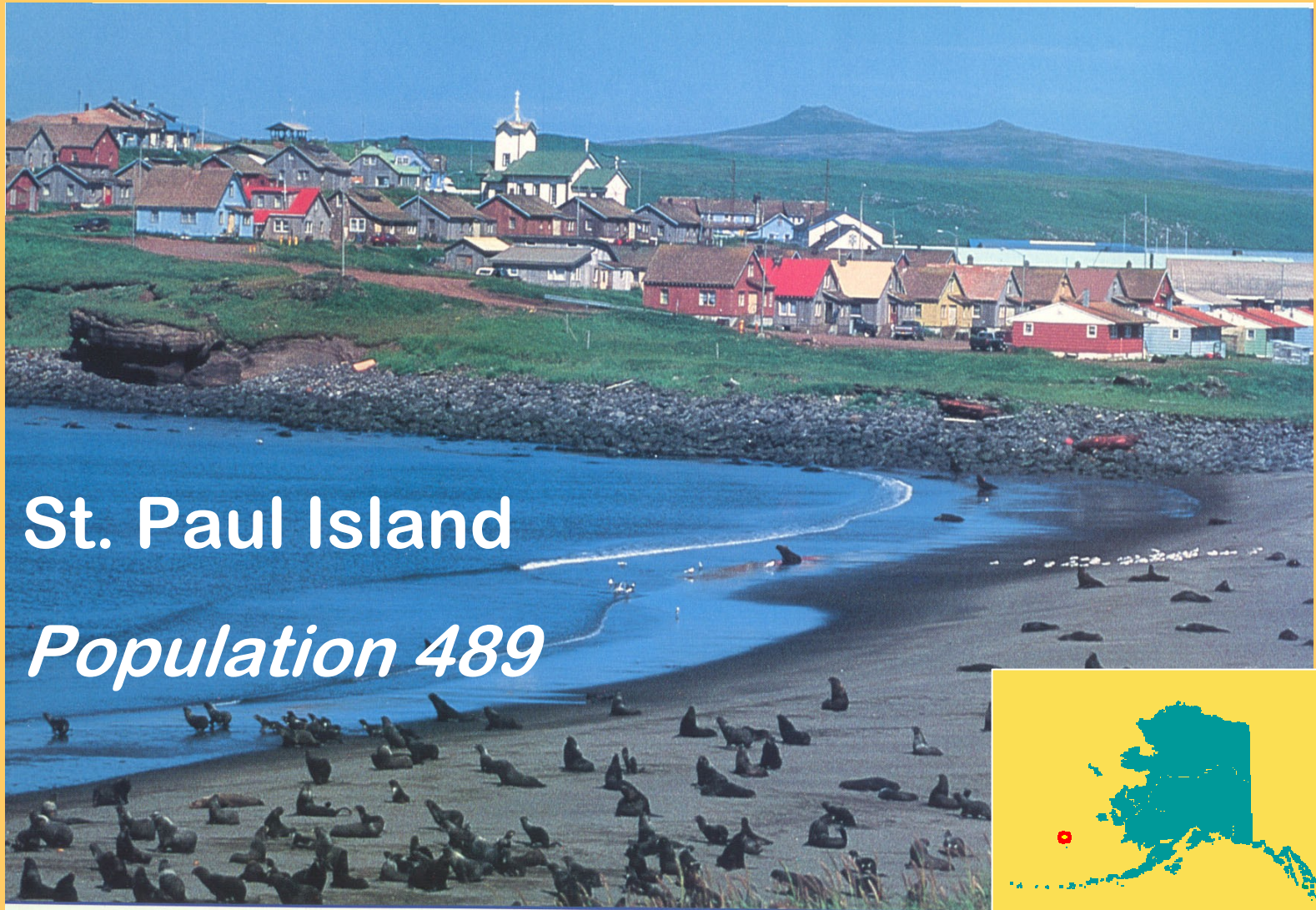


COLD HARD FACTS

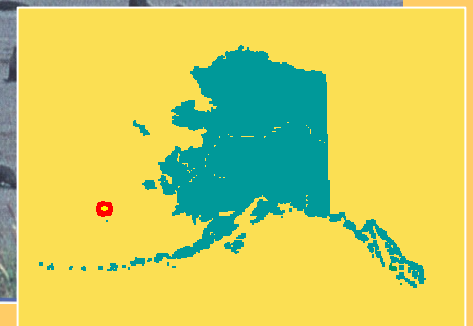
- All Fossil Fuels are Imported.
- Diesel retails for up to \$5.00/gallon for use as heating oil.
- Electricity is primarily produced by diesel generators.
- Electricity costs between \$0.22/kWh to \$0.58/kWh to produce.
- The State of Alaska's Power Cost Equalization (PCE) program subsidizes electric bills for qualifying residents in qualifying communities.
- APIA declined the gift of heating oil from Venezuelan-owned CITGO.
"...Despite the critical need for fuel in our region, the Unangan people are Americans first, and we cannot support the political agenda attached to this donation."
Dimitri Philemonof President/CEO APIA

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St. Paul Island
Population 489



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**OUR PARTNER AND MODEL FOR
TECHNICAL SUCCESS**

TDX POWER

a subsidiary of

Tanadgusix Corporation

St. Paul Island, Alaska

CEO Ron Philemonof points to a still turbine. A rare site; the wind isn't blowing in St. Paul.

- A Vestas V-27 Wind Turbine (225 kW) is integrated with two 150 kW Volvo Diesel generators to create a high penetration wind-diesel system.
- Excess electricity heats water to offset diesel heat for the industrial camp owned by TDX at the airport in St. Paul.

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Two more Vestas V-27 wind turbines were added to the St. Paul installation in the summer of 2006.

At this time, they are not connected to anything.

“Technology is only half the problem—the human element is the other half.”

Ron Philemonof, CEO Tanadgusix Corporation

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ST. GEORGE ISLAND *Population 89*
“The Galapagos of the North”

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Least Auklets

Red Legged Kittiwakes



ST. GEORGE ISLAND

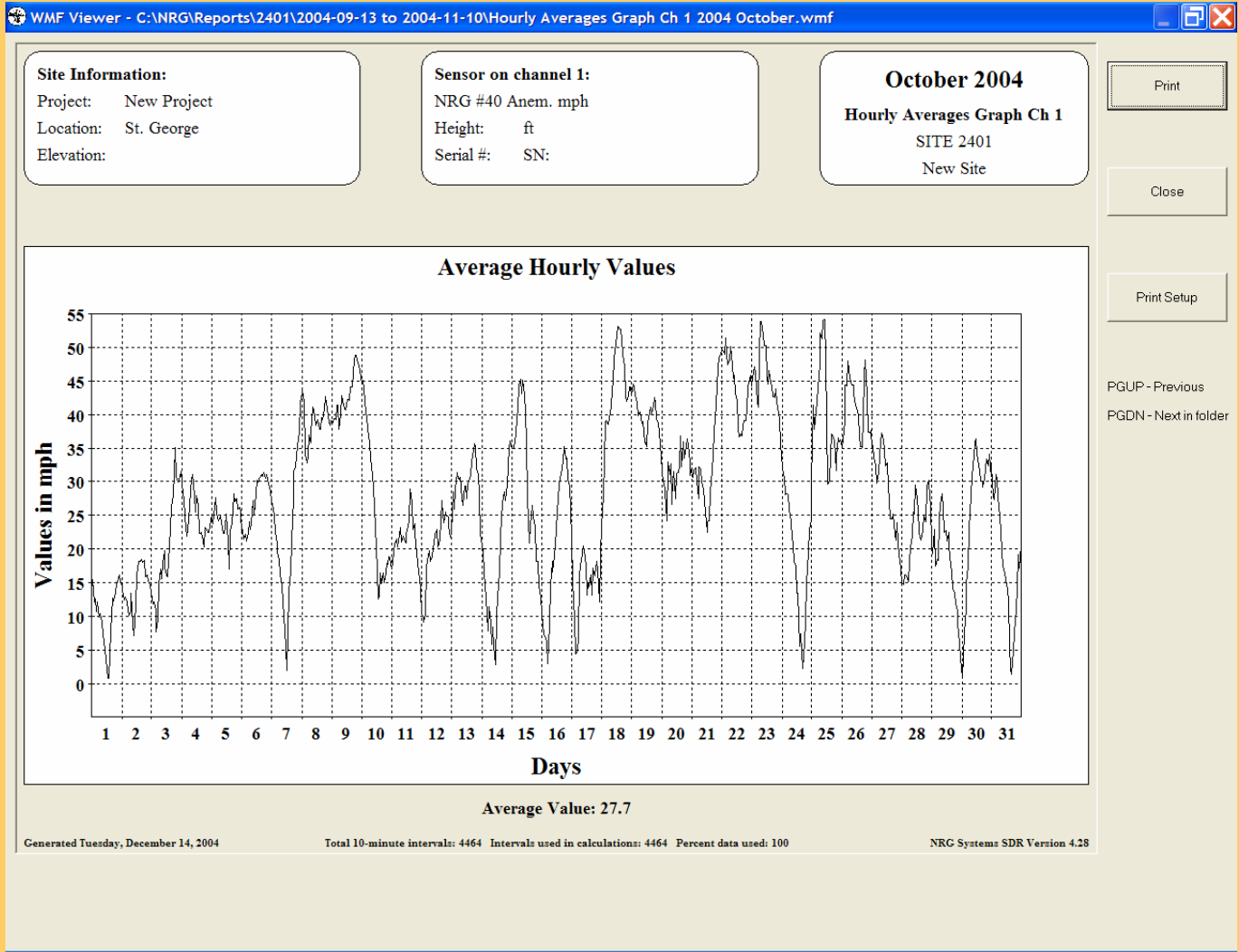


After two years of observations by locals, USDA employees, and various USFWS personnel and interns, avian interaction was deemed to be negligible or absent.

Official USFWS Approval Is Still Pending

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St. George Wind Data

21.5 mph

**Turbulence
Intensity 0.11**

7+ Superior

**Capacity
Factor 53%**

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St. George Project

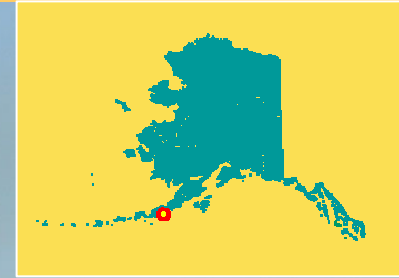
- Utility owned and operated by The City of St. George
- Average Electric Load is 225kW
- Peak Load is 280 kW
- Existing power plant has 2 Caterpillar 175 kW generators and a Detroit Series 60 350 kW generator
- Annual Average wind speed is 21.5 mph
- Ampy Pre-pay Electric Meters were installed March '06 for improved utility sustainability and consumer energy conservation
- Energy efficient light bulbs given to every household when pre-pay meters were installed

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SAND POINT

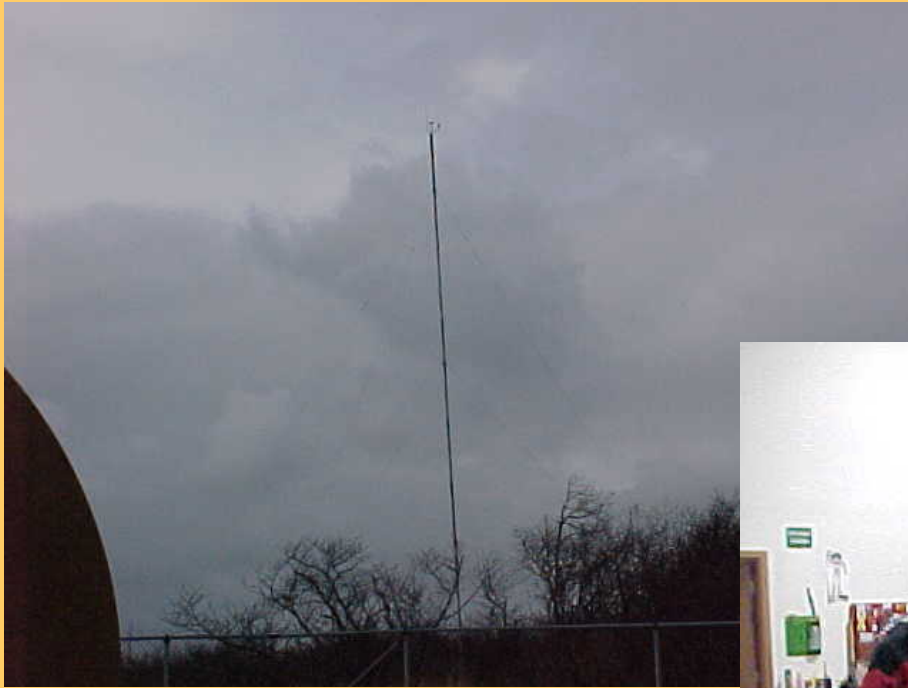
Population 951



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Average Annual Wind Speed is 20 mph



John Lyons, Justin Godbehere and Art Torres at Sand Point Generating, Inc.



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Sand Point Project

- Utility owned and operated by TDX Power dba Sand Point Generating, Inc.
- Average Load is 600kW
- Peak Load is 900kW
- Caterpillar Diesel Generators: 2 350 kW (rarely used), 650 kW, 800 kW, 1200 kW
- TDX Power was awarded \$1.47 million from the Alaska Energy Authority to install 2 500kW Vestas wind turbines. Planned for summer 2007

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KING COVE

Population 723



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KING COVE

Nick Goodman watches as Harlen Newman explains the data logger to Belkofski Tribal Environmental Coordinators "Doll" Kochuten and Tatiana Samuelson.



The Belkofski Tribe and APIA are working with high school and middle school science teachers to incorporate wind energy into their program.

Last May we flew kites to check turbulence at the met tower site. This November we will introduce model turbines and KidWind curriculum.



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Harlen found a “gin pole” from the dump when our tower kit arrived without one.

Screw in anchors were dug in, anchored with rocks then dirt, and then more rocks.



KING COVE

Ingenuity is a requirement in Rural Alaska.

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King Cove Project

- Utility owned and operated by the City of King Cove
- 850 kW Hybrid hydroelectric- diesel power plant
- Average Load is 500 kW
- Peak Load is 650 kW
- Glacier now feeding hydro is melting; a new stream is being studied as well as wind potential to integrate with new diesel plant being planned.
- Anemometer will be moved to be closer to the proposed new diesel plant and, hopefully, a less turbulent site.

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FALSE PASS
Population 50

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FALSE PASS



This location, although scenic, has proven hard to access and connection costs will be prohibitive.



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FALSE PASS

A bear chewed through wiring in July 2005, delaying data collection.



*Mia Devine
and George
Jackson
raise the
data logger.*



Raising the data logger to 25' in November 2005 prevented repeat damage. But attempts to install the predator proof fence required by USFWS were abandoned after persistent bear intervention and obvious disapproval.

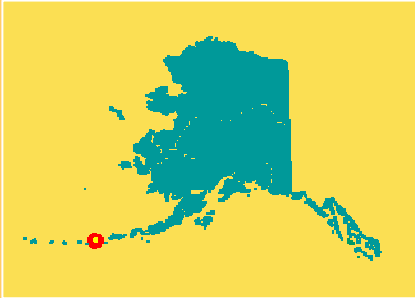
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False Pass Project

- Utility owned and operated by the City of False Pass.
- Average Load is 36 kWh.
- The anemometer tower will be moved to town behind the diesel plant this winter after the creek goes down.
- The bears win.





Nikolski, Umnak Island

Continuously inhabited for over 10,000 years

Population 39

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Wild horses, cattle, reindeer and sheep wander the island and visit town.

A Nikolski Lodge visit is prized by wealthy fishermen and duck hunters. Weather determines the winners.

Rock basket anchors hold satellite dishes down.



Nikolski



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Mia Devine makes sure AJ Lestenkof and Rodney Harris know how to operate the data logger before she leaves the island.

We assembled the met tower in sideways rain with eye-piercing sleet.

Before quitting that night we asked the weather gods for their blessing next day.

In the morning the wind held its breath while we raised the tower, beginning to blow again just minutes after we finished.

A good sign?

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Nikolski Project

- Utility owned by Nikolski IRA / Secondary Operator is TDX Power.
- Average electric load is 25 kW.
- Peak load is 50 kW.
- AEA recently commissioned a new diesel plant with 2 John Deere 70 kW generators and a 37 kW generator.
- USDA/RUS awarded APIA \$474,475 to incorporate high penetration wind with the diesel plant. Good Sign!
- Increasing costs for steel and transportation has raised the price by nearly \$100,000 since grant award
- Unfunded modifications to the controls in the diesel plant may be required

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Education and Training



Paul Melovidov and Art Torres



Fepuali Valelei, Robert Kochuten, Rodney Harris

Vestas Operations and Maintenance Training

Portland, Oregon September 5-9, 2006

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Made Possible with Funding and Assistance from:

USFWS

USDA/RUS

Bureau of Indian Affairs

US Department of Energy

State of Alaska Energy Authority

Tanadgusix Corporation / TDX Power

Aleutian Pribilof Islands Development Corporation

Thank You, Thank You Very Much

Aleutian Pribilof Islands Association, Inc.

