

DEPARTMENT OF ENERGY

Office of Energy Efficiency and Renewable Energy

Tribal Energy Program

Eastern Shoshone Tribe



Northern Arapaho Tribe





Objectives

- **Assess wind resources on tribal lands**
- **Assess development costs/impacts:**
 - Environmental
 - Cultural
 - Wildlife
 - Aesthetics
- **Assess transmission capacity now & projected**
- **Assess gas co-generation feasibility**
- **Prepare economic models for tribal leaders**
- **Educate tribal members on project benefits**
- **Prepare DOE final report**



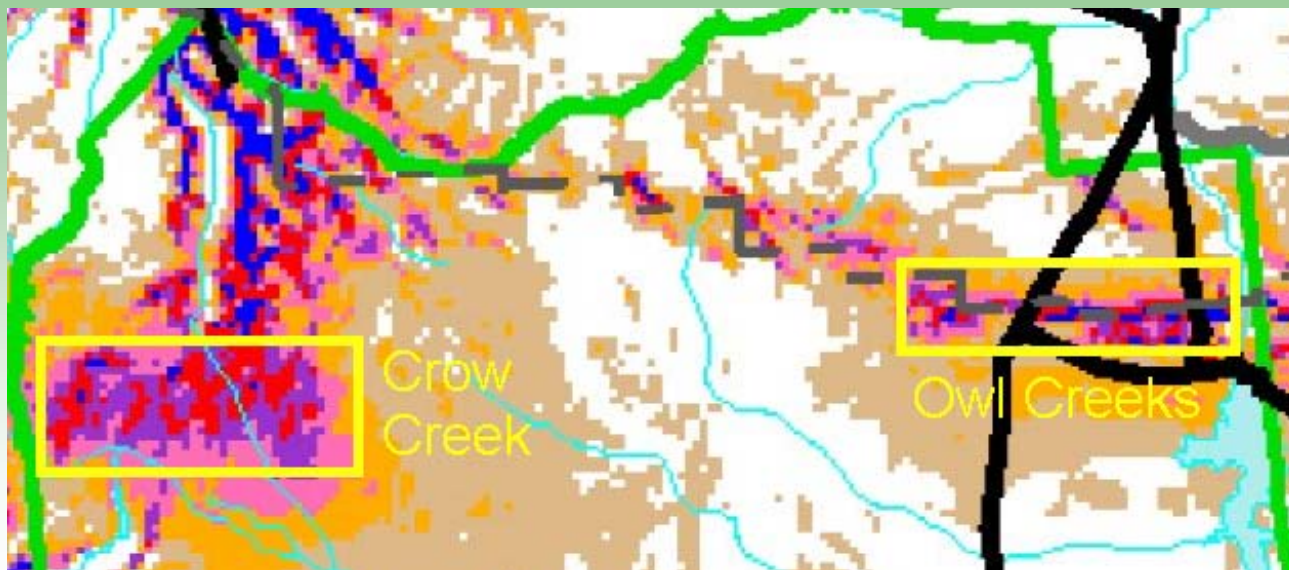
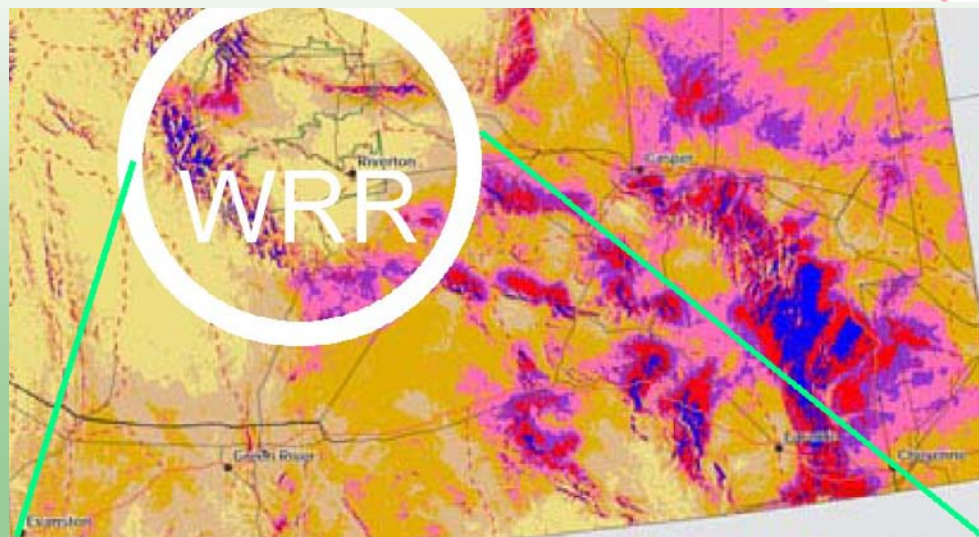
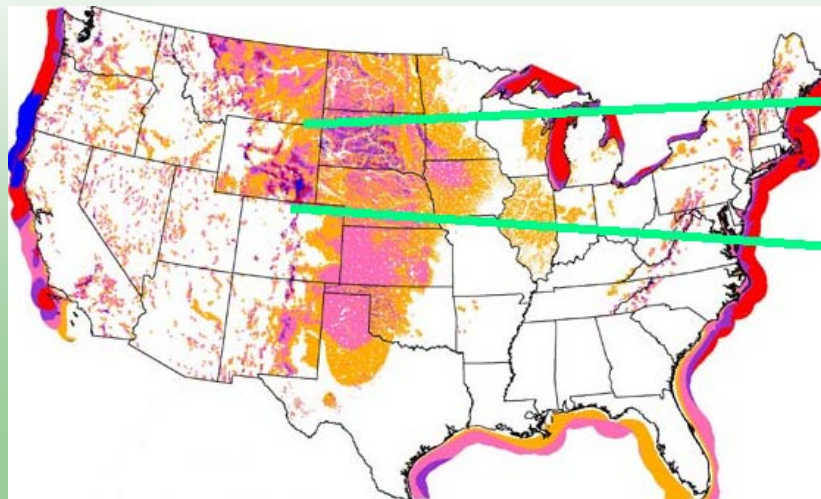
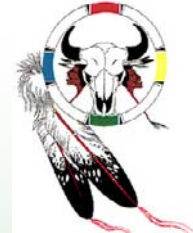
Project Participants



- **Landowners / Project Developers**
 - Eastern Shoshone Tribe
 - Northern Arapaho Tribe
- **Funding Assistance**
 - DOE Tribal Energy grant \$190,405
- **Technical Assistance**
 - Disgen
- **Met Towers & Anemometry**
 - DOE NREL
 - Wyoming Business Council



2.4M acre Wind River Reservation



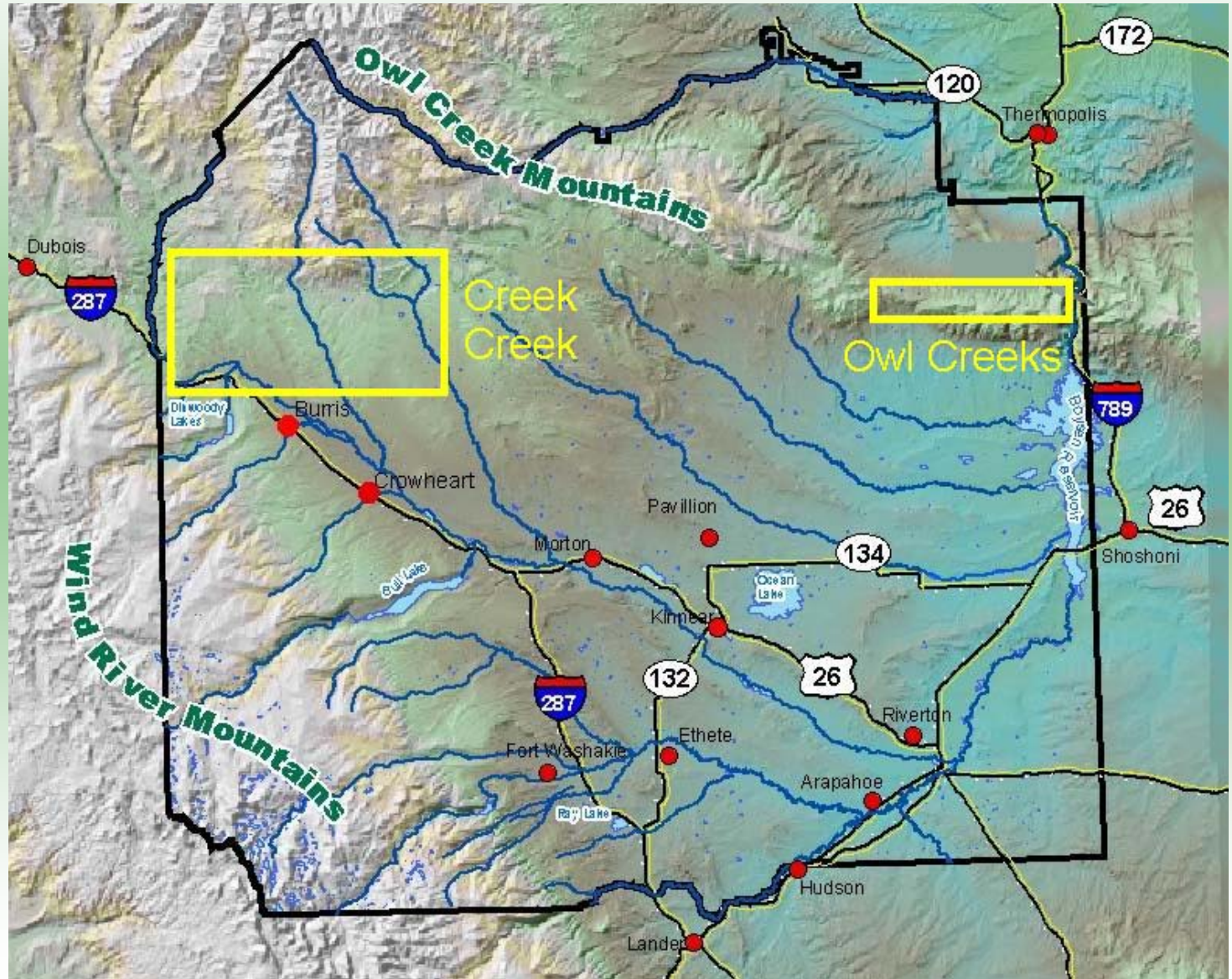


2 High Wind Areas



3,938
Shoshone
Members

•8,806
Arapaho
members





50m Met Tower – Sheldon Dome



18 months of meteorological measurements of wind speed at three levels, wind direction at two levels and temperature.





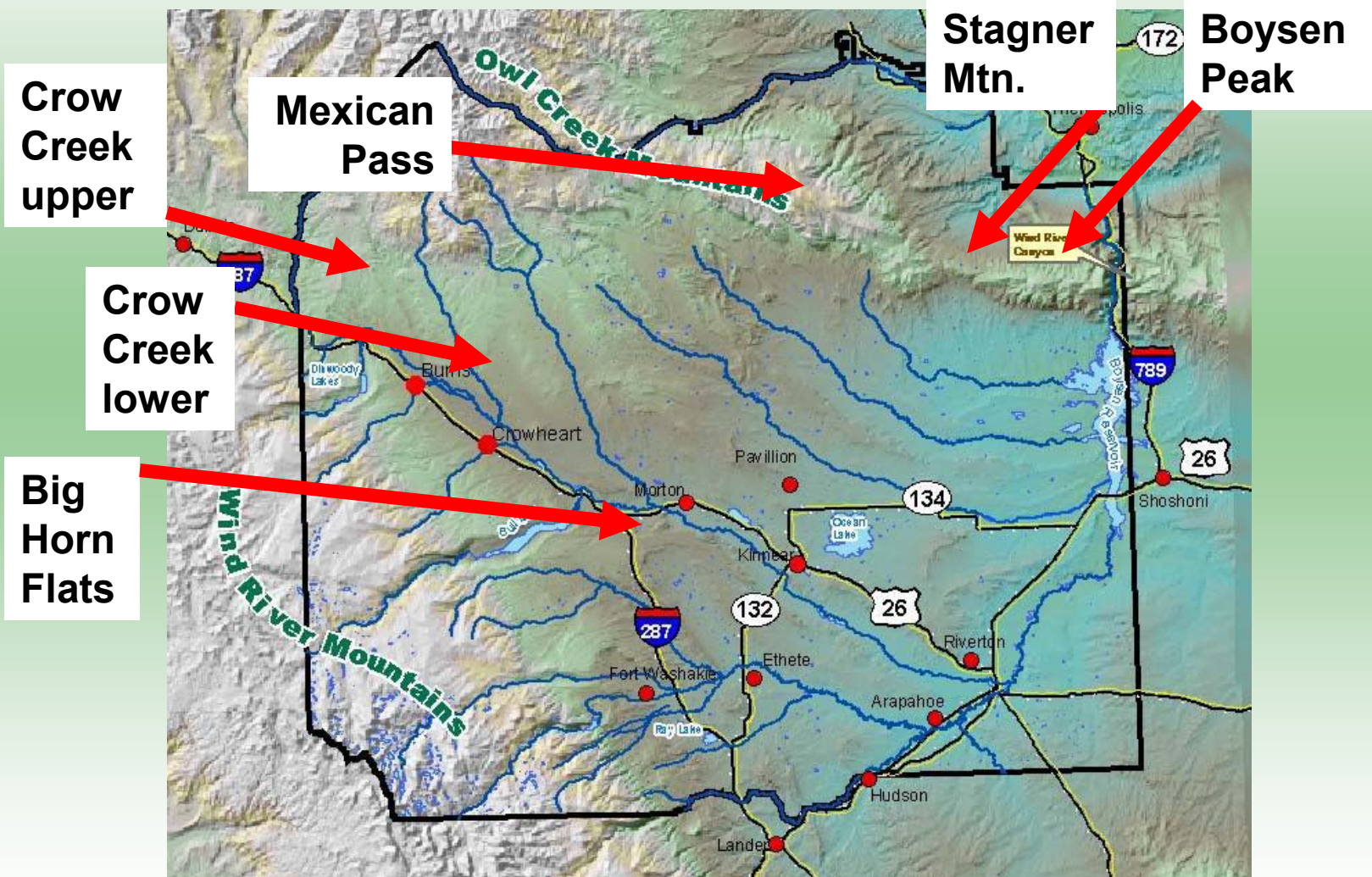
Wind Data Gathering



- **2 sites were evaluated**
 - Bighorn Flats
 - Sheldon Dome
 - 3rd tower on Boysen Peak was blown over
- **4 more sites to be evaluated**
 - Crow Creek (upper)
 - Crow Creek (lower)
 - Stagner Mountain (near WAPA line)
 - Mexican Pass (near RMP line)



Met Tower Locations





Accomplishments

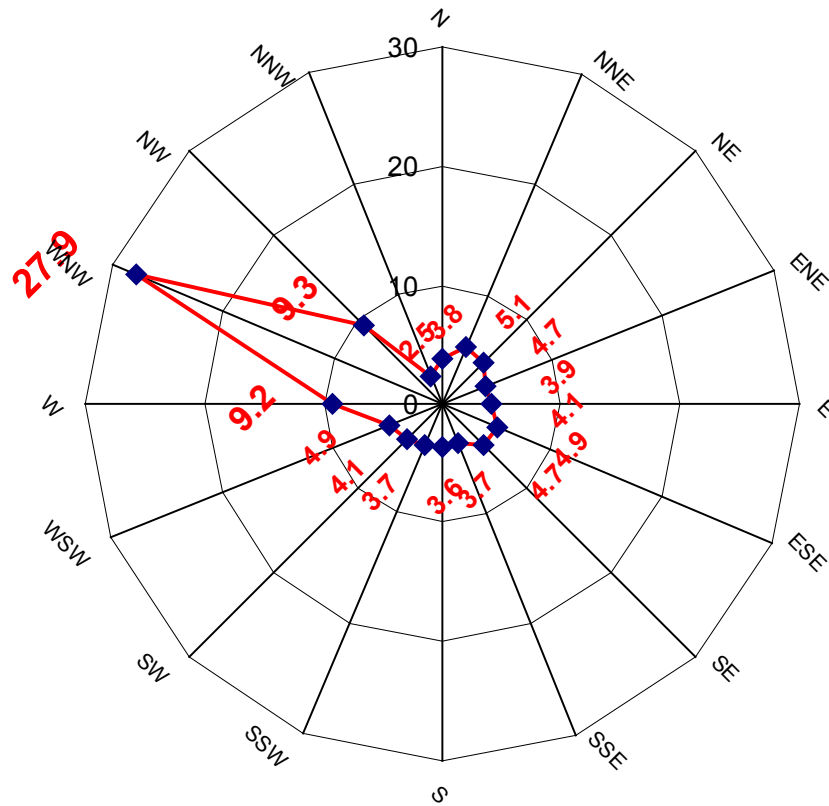


- **Site visits by meteorologist**
- **Site visits by cultural expert**
- **Avian study completed**
- **18 months of meteorological measurements**
- **Consistent wind direction**
- **Steady wind speed Class 4 and above**

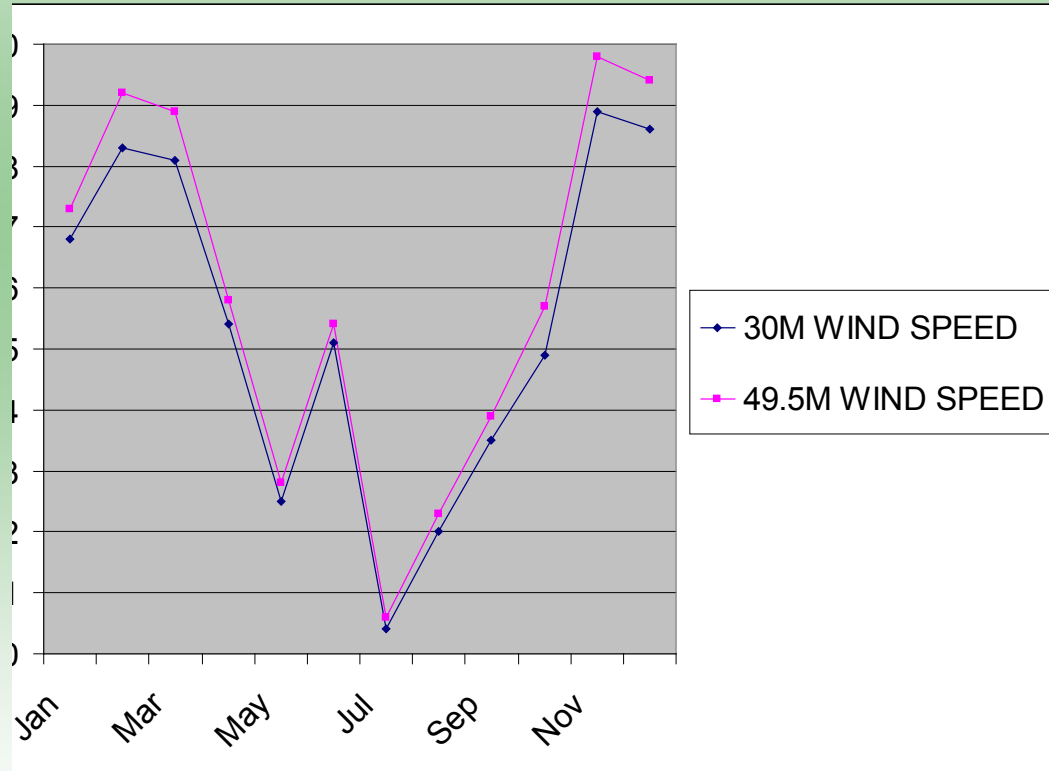
Wind Rose – Sheldon Dome



Percentage of Time at Speed & Direction



Wind Speed at 30m & 50m

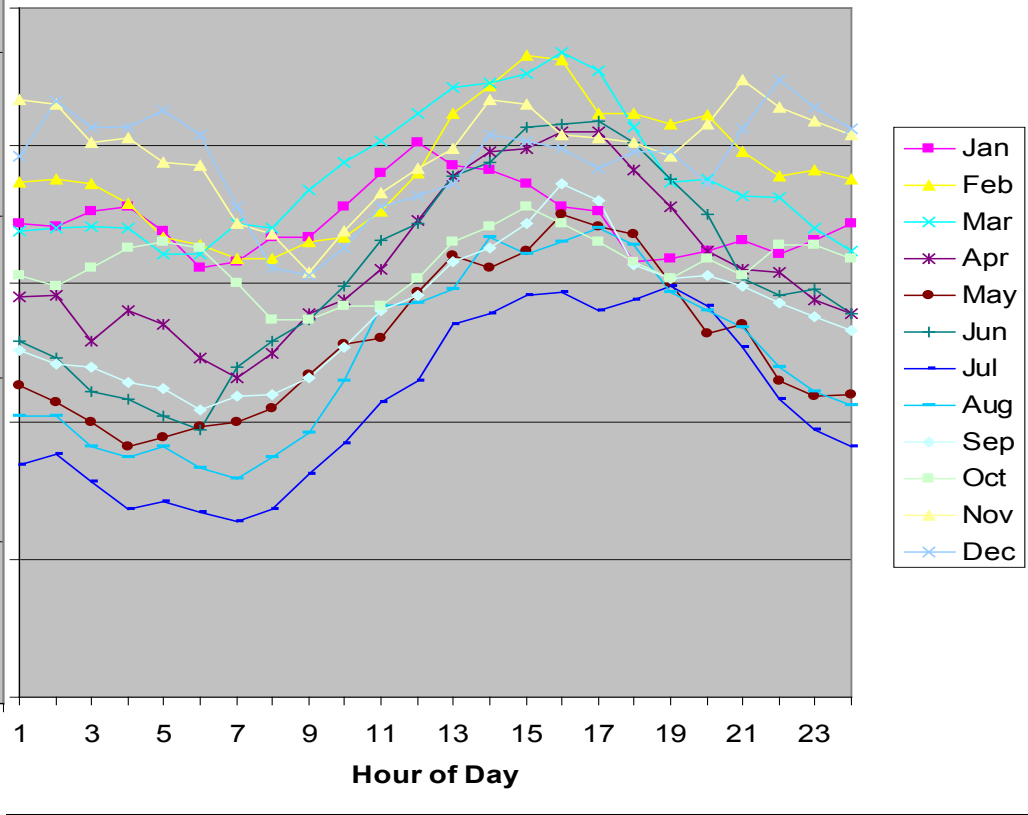
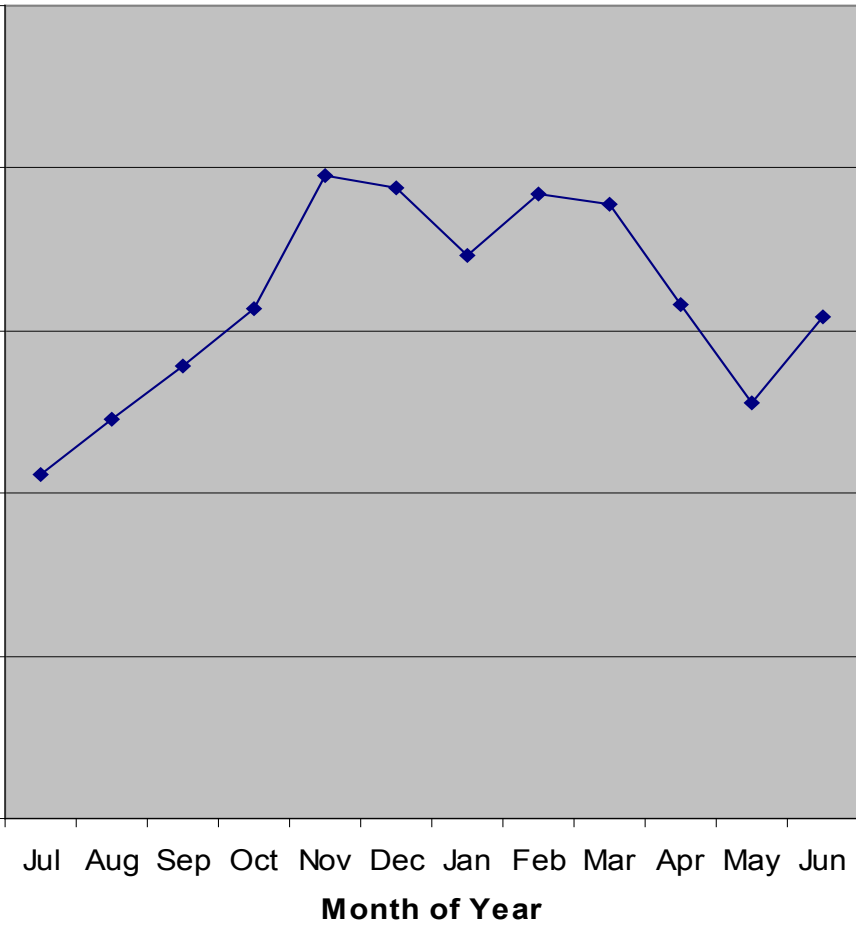




Average Speed by Month



Average Wind Speed By Month

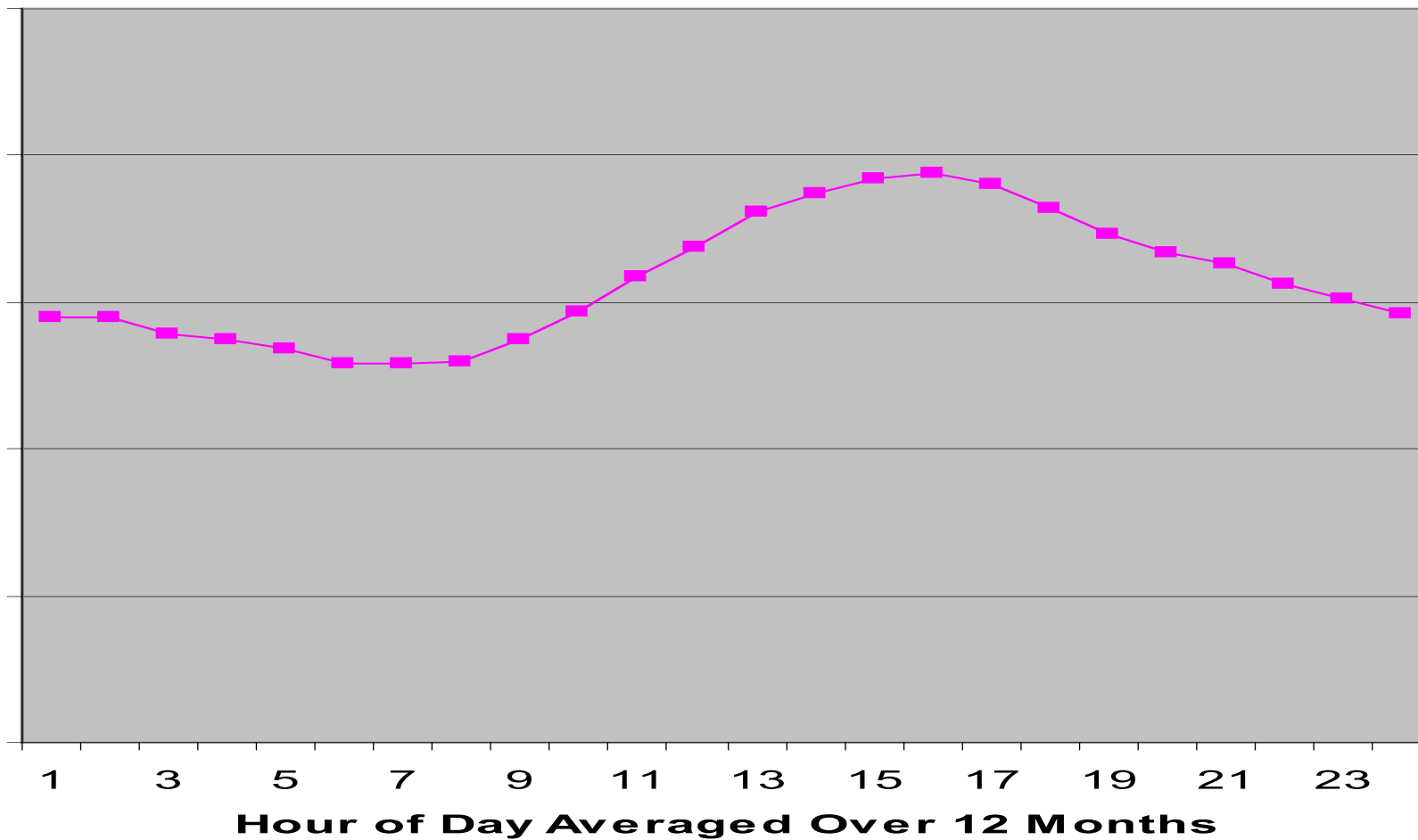




Average Speed by Time of Day

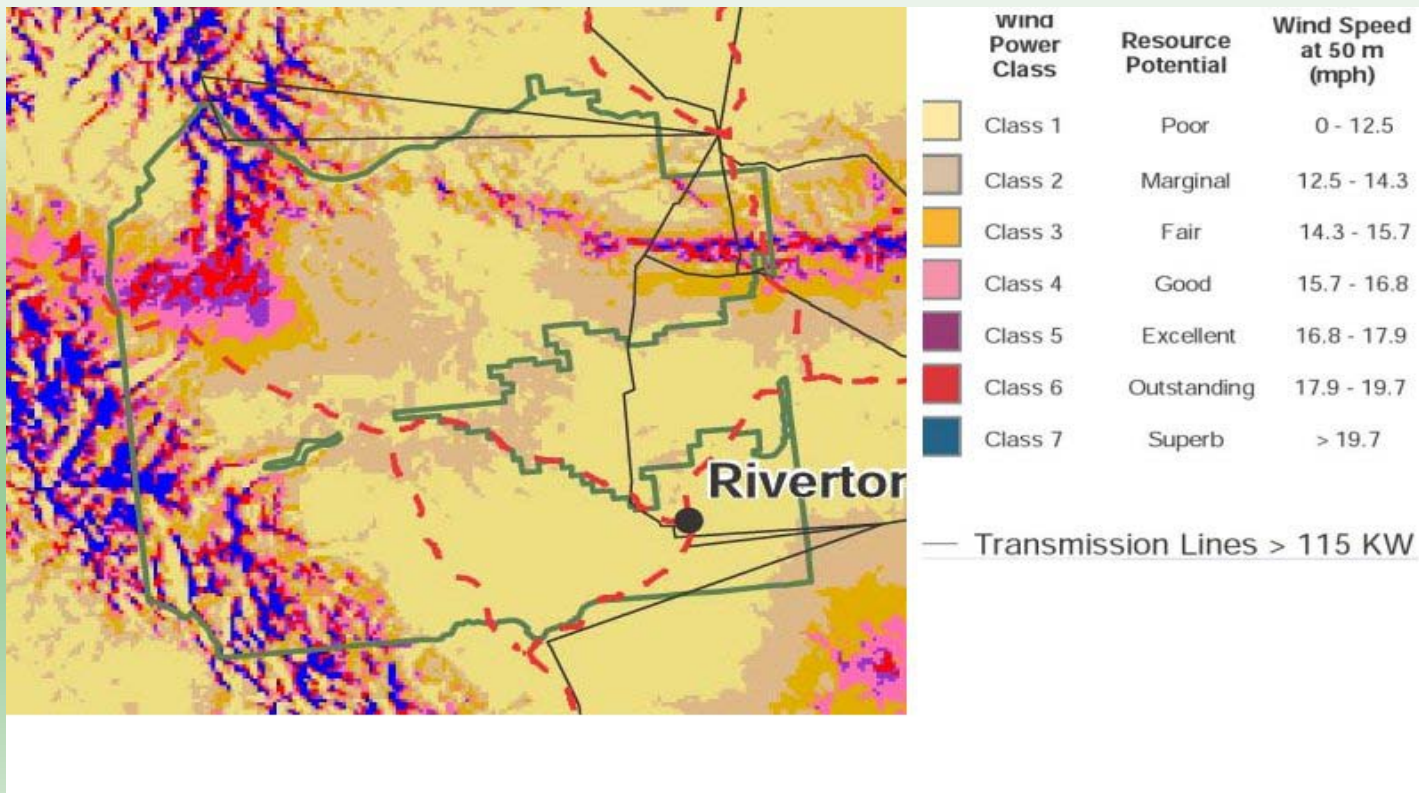


Hourly Average Wind Speed





Lessons Learned So Far



- The NREL's wind power classification for the Sheldon Dome area is Class 3 (Fair) 12 miles West/North would likely result in significant speed increases
- Virtually all 60 sq mi west and north is tribal land
- Most is level with sandy soil that is amenable to wind farm construction



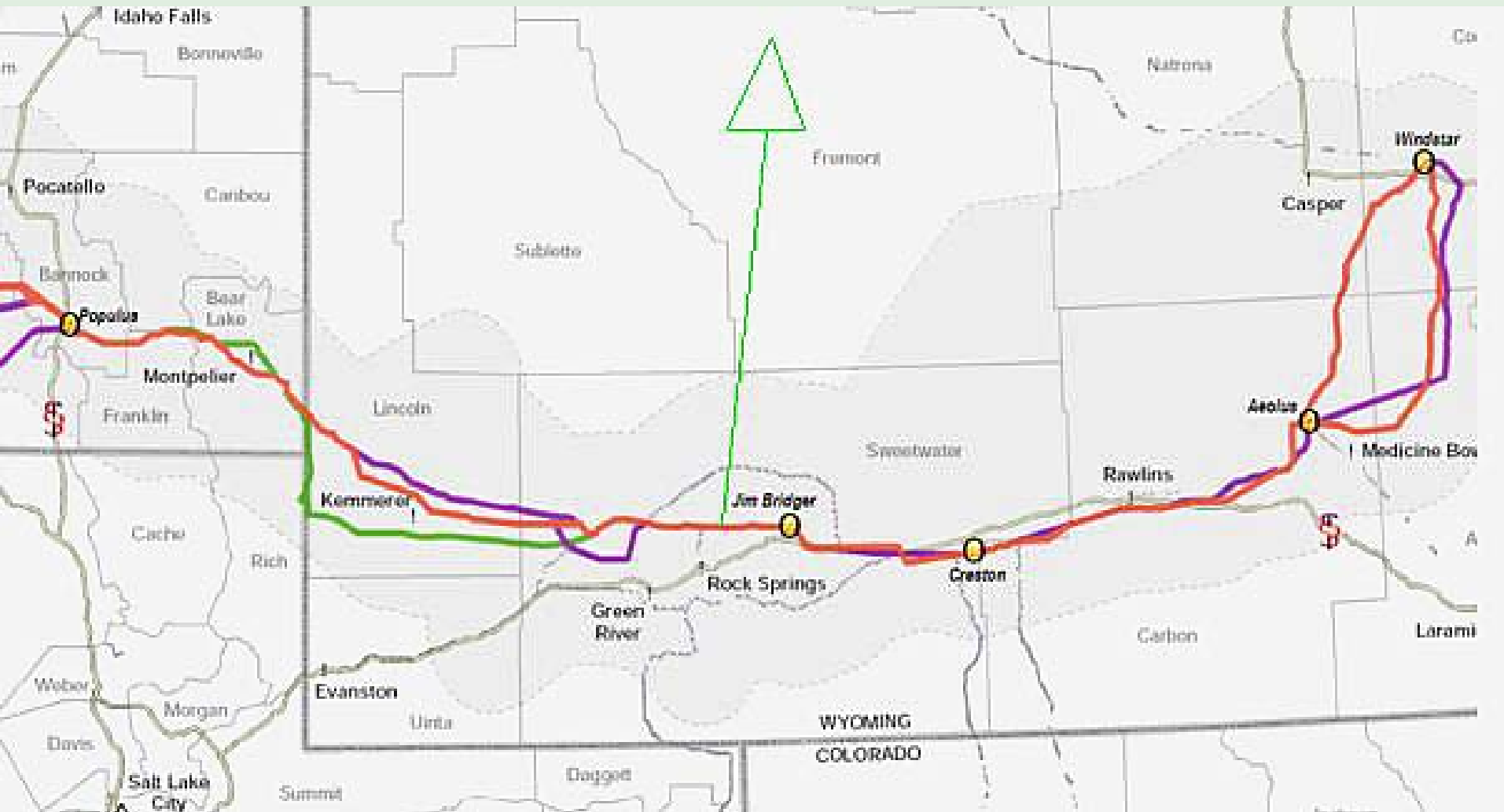
Activities Yet to Be Completed



- **Collect 1+ year of wind data**
 - Crow Creek (upper & lower)
 - Stagner Mountain & Mexican Pass
- **Transmission Capability Review**
 - Evaluate construction costs & options
- **Pre-Market Review**
 - Local utility has indicated interest
- **Wider cultural/archaeological Review**
- **Evaluate Co-generation with Gas Turbine**



Wyoming Proposed Transmission





Development Steps for 2 Projects



- Educate Tribal & community members on wind energy
- Get the regulatory colossus in motion
- Current & projected transmission status
- Firm up gas turbine co-generation feasibility
- Identify likely power purchasers
- Identify possible construction companies
- Identify likely investors including Native American
- Develop a Business Plan
- Prepare RFPs

investors

PPA/loads

transmission

equipment



Contact Information



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