Using Community Weather Data to Influence Community Energy Decisions

Tyler Katzmar, Energy Educator *tkatzmar@realaska.org* 



Renewable Energy Alaska Project



## Land Acknowledgement

- I live on Dena'ina Ełnena, the ancestral and unceded homeland of the Dena'ina
- REAP staff live and work on the lands of the Tlingit, Dena'ina, and Ahtna
- We acknowledge the thousands of years of stewardship of these lands and waters and life, and the Indigenous knowledge and ways of life that continue to guide us today



#### Renewable Energy Alaska Project (REAP)

- Mission: to facilitate the increased development of renewable energy and energy efficiency in Alaska through <u>collaboration</u>, <u>education</u>, <u>training</u>, and <u>advocacy</u>
- Education team provides classroom visits, teacher trainings, materials and curriculum, and other outreach



# Weather Education Program

- REAP purchases and loans 10 Davis Vantage Pro2 weather stations to schools in Alaska
- Goals:
  - Use local weather data to assess renewable energy potential at school site
  - Increase STEM learning and citizen science opportunities
  - Contribute to local meteorological data sets
  - Help engage students in community energy decisions
- Free for schools



## **Example Research Questions**

- Is there a viable solar or wind resource in the community?
- How are temperatures related to community heating costs?
- How does the amount of HDD relate to the amount of energy required to heat our school?
- How can we use the weather station to determine if a commercial air or ground source heat pump would be a viable option of supplementing heating?



# **Davis Vantage Pro2**

- Data Collected:
  - Wind Speed and Direction
  - Temperature
  - Humidity
  - Solar Radiation
  - Precipitation
- Solar powered with backup battery
- Unit reports remotely to Weatherlink Live modem
- Dashboard can be used for real-time observations, historical data, and graphical data



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#### Data

WEATHERLINK bulleti	bulletin chart data map mobilize 🛛 🕹 What's Ne					Add Devices Search location
	Current station: REAP Wx Device Tier: Pro ③					
Last updated: April 6, 2022 / 9:52 AM						🖗 REAP WX 🎽
Temperature REAP Wx 50 °F 25 °F 0 °F 0 °F 0 °F 0 °F 0 °F 0 vtside <sup>Temp</sup> Wind <sup>Chill</sup> Heat Inde	23 23 Dew Polink Wer Bulb	Wind Speed REAP Wx	Wind Direction REAP Wx N W SW SW S S S S E	Wind Rose REAP Wx	Total Rain <i>REAP Wx</i> 5.00 n 4.34 2.50 n 0.00 n 0.013 Month Year	Solar Radiation REAP Wx 0 93 W/m <sup>2</sup>
ET REAP Wx 2.00 in 1.00 in 0.00 in	Current Rain <i>REAP Wx</i> 0.16 in 4.00 in/hr 0.08 in 2.00 in/hr 0.00 in 0.00 0.00 in/hr	Humidity REAP Wx	THSW Index REAP Wx	SW SE DAY WEEK MONTH 0-2 mph 2-4 mph 4-6 mph 6-8 mph 8-10 mph 10-20 mph - 20 mph	Barometer WeatherLink Live 1010.0 mb 1008.0 mb 1006.0 mb 4 ÅM 5 ÅM 6 Å	M 7ÅM 8ÅM 9ÅM
Local Forecast WeatherLink Live Morning 37 °F   0 10% More Clouds than Sun	Sunrise/Sunset WeatherLink Live 7:07 AM 6:58 PM	Moon Phase WeatherLink Live	THW Index REAP Wx	Inside Temp/Hum WeatherLink Live 100 "F 100% 50 "F 66 47 50% 0 "F Temp Hum 0%		



Beaufort Sea

## Weatherlink Ecosystem in Alaska



## **Challenges and Lessons Learned**

- Similar programs have not lasted long
  - See UAF Artic Climate Modeling Program
- Clear need for supporting curriculum
  - Curriculum in development
- Some schools lack the staff, expertise, and assets to install and maintain the weather stations
  - Travel to school site for initial install and relationship building
- Teacher turnover
  - Find the star teachers





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## Wrap Up

- Anyone interested in fostering a weather station or learning more? Scan here  $\rightarrow$
- Six stations are currently on location
- Five stations installed and reporting
- Three stations still available





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# Thank you!QuyanaBaasee'Tsin'aenChin'anGunalchéeshQuyanaqMahsi'DogedinhQuyanaaHáw'aa

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