The Wind Resource Assessment Network

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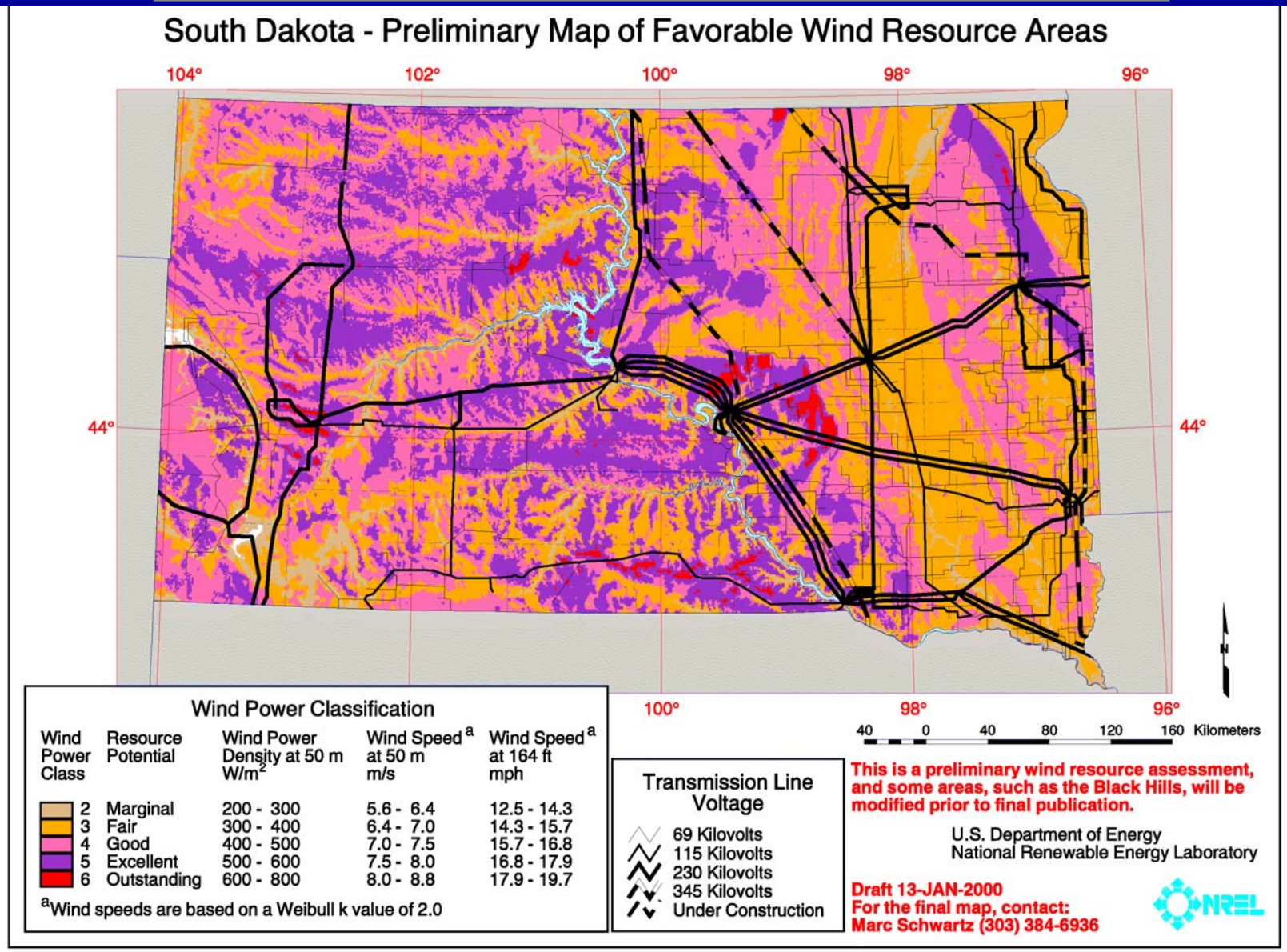
SDSU

South Dakota's wind resource



Why the WRAN?

- The map and all other studies are based on *computer models.*
- Almost all measured data is in private hands; *competitive asset.*
- No way for most South Dakotans to knowledgeably engage in discussions about:
  - ☒ economic potential of SD windpower
  - ☒ target areas for economic development
  - ☒ **the need for new transmission lines**
  - ☒ validity of claims made

Why the WRAN?

This need for a database of measured wind speeds that

- is publicly accessible;
- is produced by an “advocate of the state” (impartial);
- contains data appropriate for performance predictions for modern wind turbines (i.e. at greater heights)

is being be addressed by the **Wind Resource Assessment Network (WRAN)**.

The WRAN

What it is:

- Network of seven instrumentation stations (so far)
- Instrumentation on East River Electric Cooperative and West Central Electric Cooperative microwave relay towers, and one 50-meter tilt-up tower
- Wind speeds and directions measured at 50m and 70m (+ 90m at Murdo; solar irradiance and temperature also measured)
- Data communicated to central WWWeb server (at SDSU)
- All findings posted on the WWWeb for public use

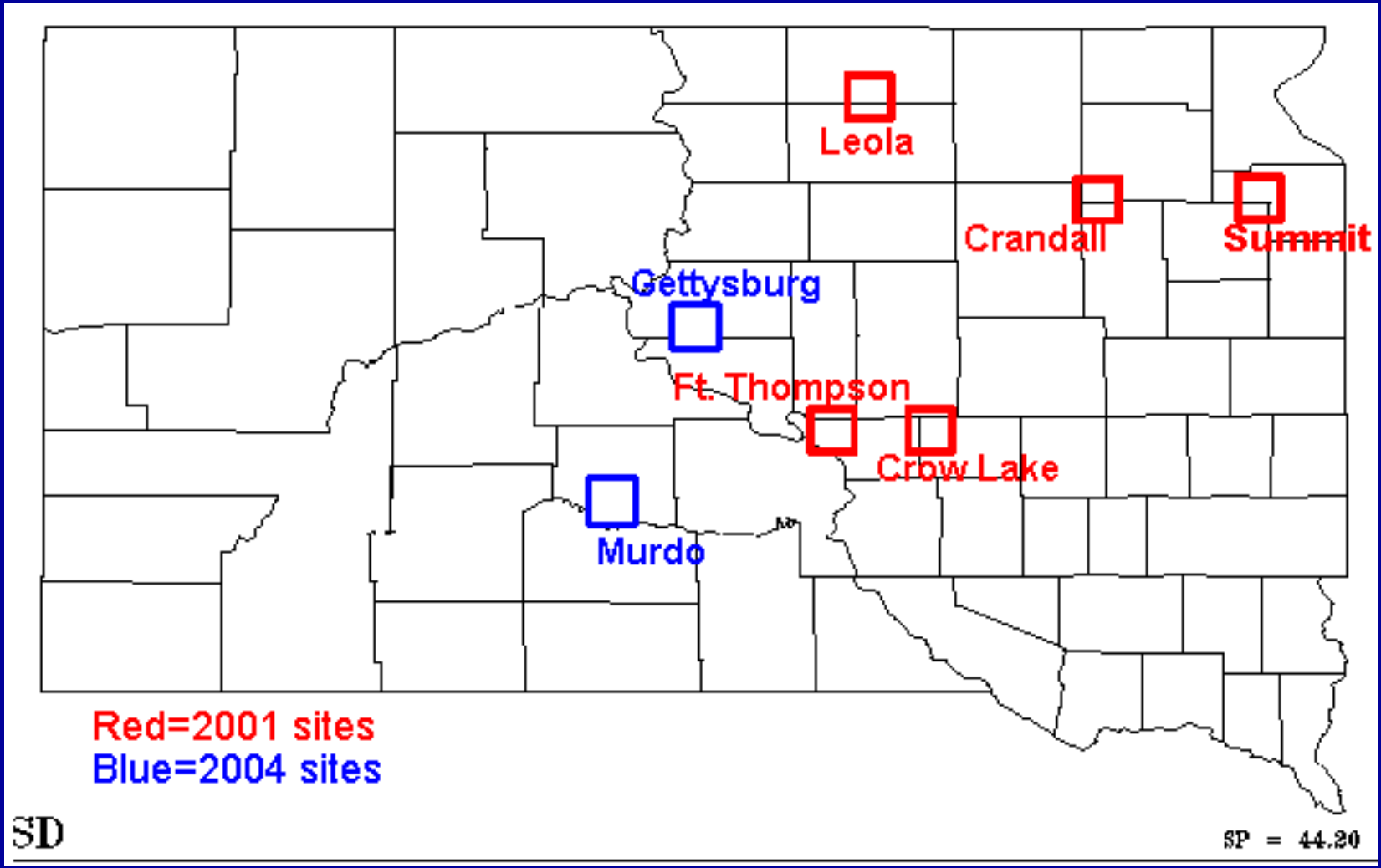
The WRAN

Where it is:

http://www.sdwind.com

South Dakota State University
EECS Department

The WRAN



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The WRAN

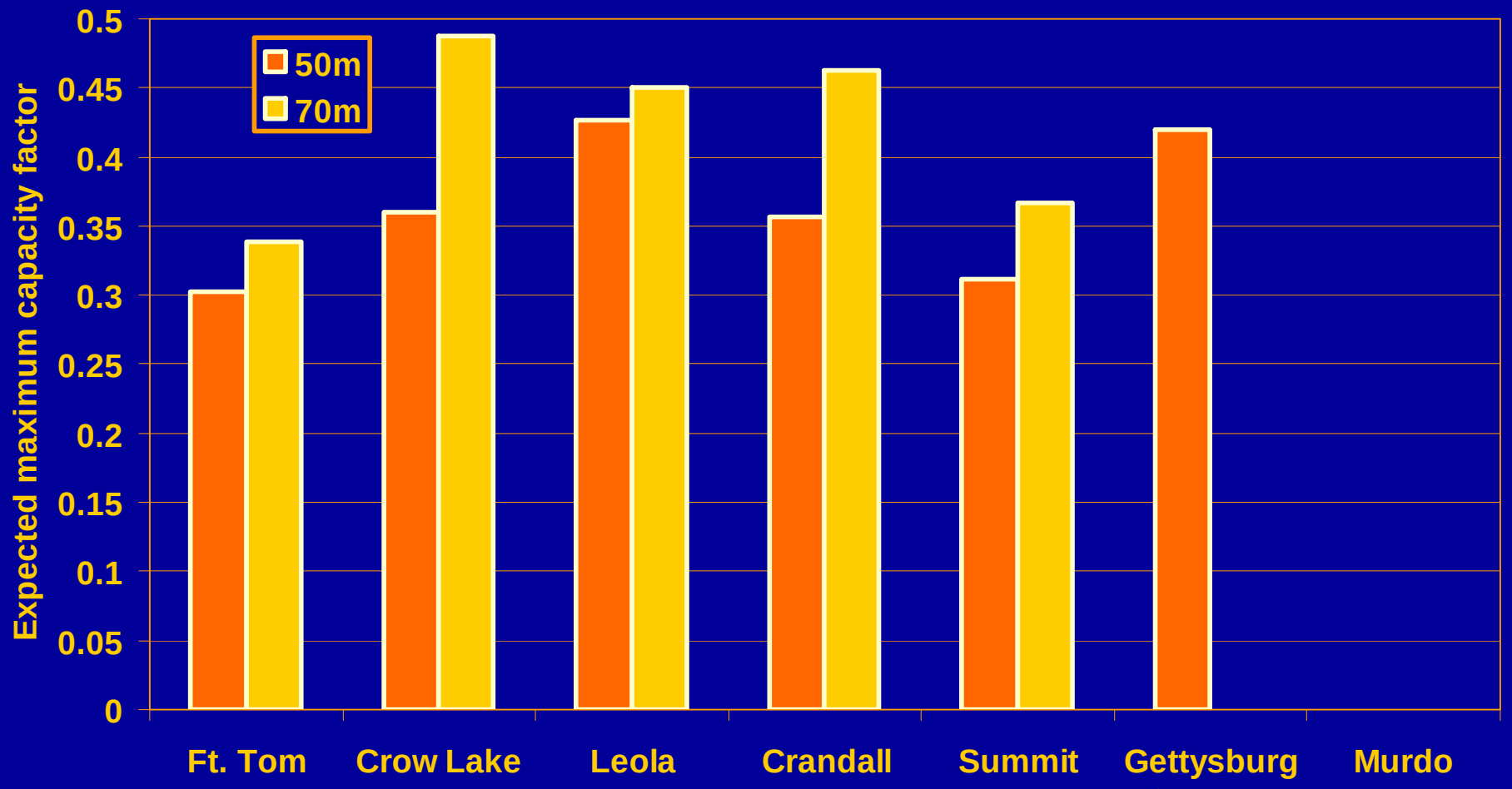
Who is involved (alphabetically):

East River Electric Cooperative
EECS Department, South Dakota State University
FPL Energy
Gettysburg/Whitlock Bay Development Corporation
National Renewable Energy Laboratory
SD Governor's Office of Economic Development
South Dakota Public Utilities Commission
U.S. Department of Energy
West Central Electric Cooperative

Crandall WRAN site

South Dakota State University
EECS Department

WRAN results so far



Note: Gettysburg cap factor based on nine months' worth of readings.

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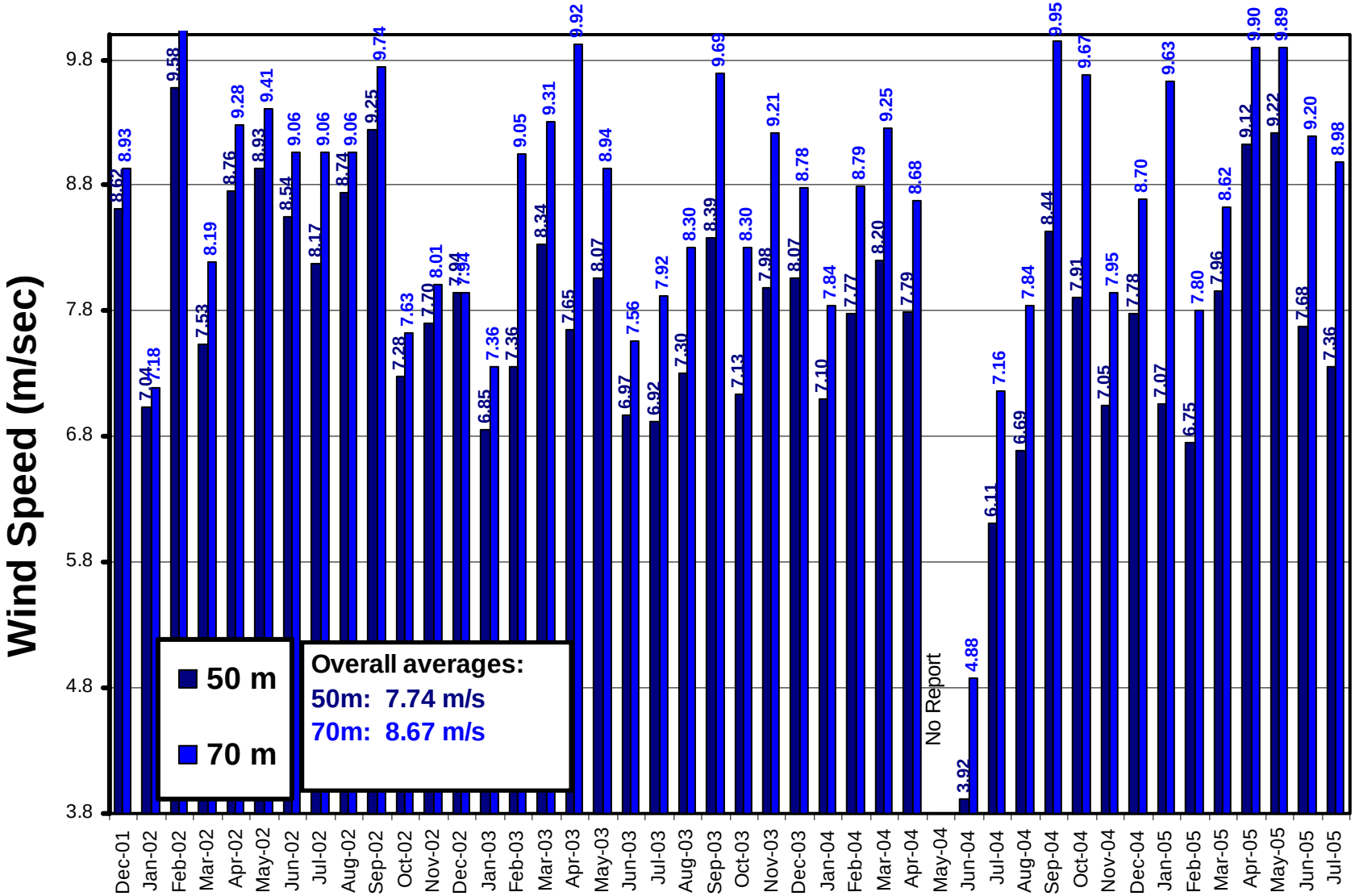
WRAN results so far



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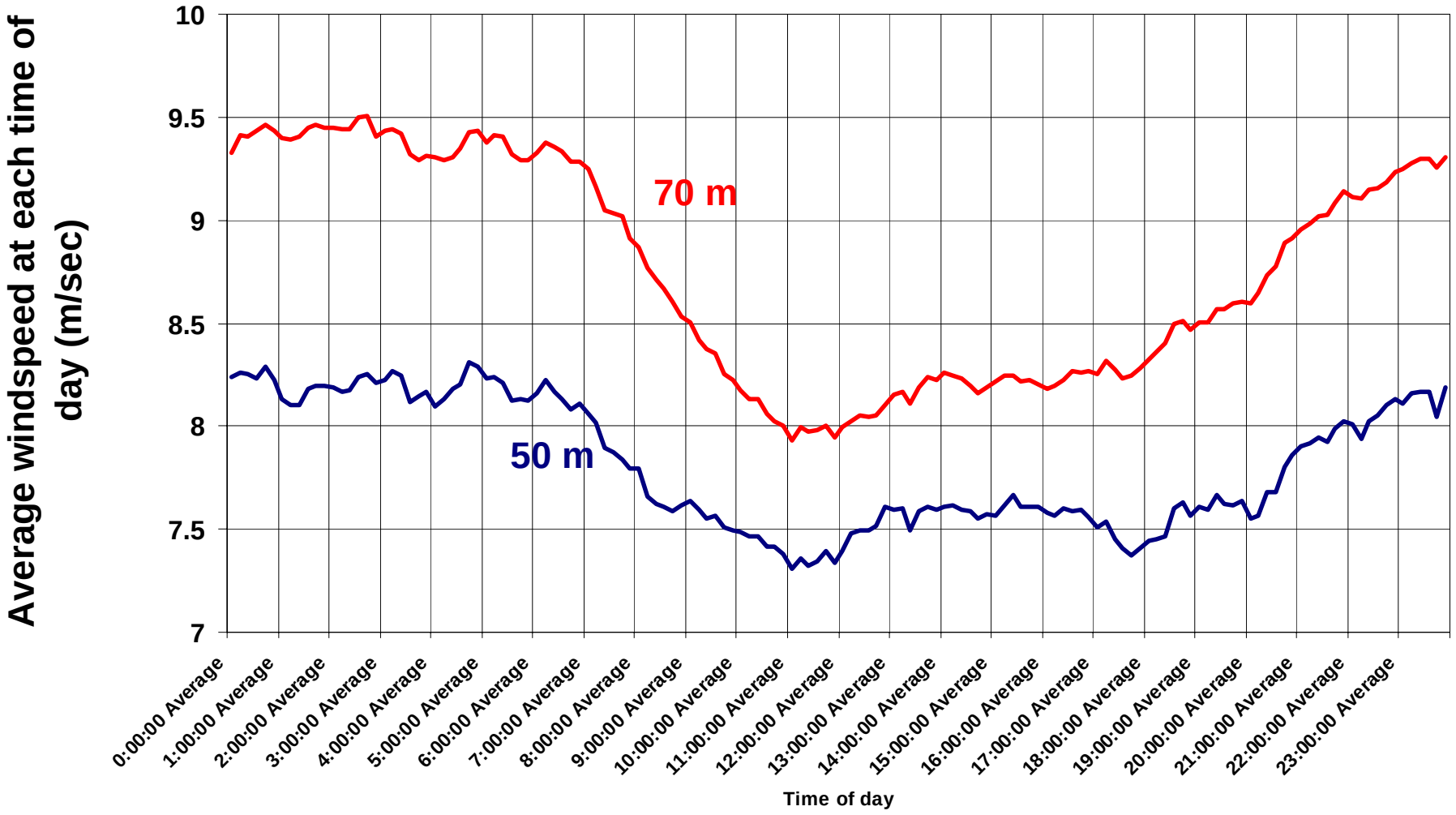
Crandall monthly data

Data available on the web

Diurnal variation of wind speed—typical pattern



Summary of results

- ☑ All seven WRAN sites appear feasible for windpower development
- ☑ While useful, the NREL map does not indicate all favorable sites
- ☑ Data collected by a state entity CAN stimulate developer interest in new areas
- ☑ The WRAN should be expanded to cover more of the state *(in progress)*

Closing remarks

- Biggest challenges to windpower:
  - ⇨ dispatchability
  - ⇨ transmission

- Biggest challenges for SD:
  - ⇨ attract manufacturers
  - ⇨ attract or home-grow developers
  - ⇨ continue to protect landowners