Use of Regional Meteorological Data

Walter Williams – SLE

Feb 5, 2026

Agenda

- Introductions
- Discuss meteorological tower construction and data analysis plan
  - Discuss regulations and guidance.
- Discuss precedence for Blue Energy's approach to meteorological tower construction
- Blue Energy to discuss data collection methods, milestones, and NRC review post CPA

Acronymns

EPZ: Emergency planning zone, **CPA**: Construction permit application, **OLA**, Operating license application, **SMR**: Small modular reactor, **ALARA**: As low as reasonably achievable, **MET**: Meteorological

Proposing Meteorological Data Alternatives

- General Premise: Blue Energy proposes exclusive use of off-site meteorological data during construction permit application.

- This reliance includes environmental characterization and emergency preparedness and planning development.

- For planning and licensing, multiple nearby meteorological towers, mesonet stations, and historic weather sources will be relied upon for all portions of the CPA.

- On-site MET tower is built during construction, prior to operating license application.
- Any discrepancies in planning due to regional data would be corrected prior to OL.

Data Representativeness

- Modern mesonet and regional airport data surround our site and can meet construction permit application needs.
- In the event where regional data is not directly representative of the site, it must be known during any hypothetical release as this meteorology is the closer nexus to public health and safety than on-site data.
- Reliance on regional data for a CPA creates conservative planning by incorporating more conditions into preliminary analysis.
- On-site data is still addressed and accounted for prior to OLA.

Regulatory Framework

- 10 CFR 20
- 10 CFR 50.36a
- 10 CFR 50.47
- 10 CFR 50 Appendix E/I
- General Design Criterion (GDC) 19
- 10 CFR 51
- 10 CFR 100

- Most pertinent portions of 10 CFR are included here
  - No regulation requires on site monitoring.
  - They require an understanding of the site that allows for adequate characterization of potential dose consequences for on and off-site analysis.
- All meteorology used for planning purposes is stochastic, regardless of location of meteorological measurements.
- Multiple off site sources results in conservative analysis.

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- Ensure that dose calculations remain conservative and accurate (ALARA).
  - Regardless of source of data used to derive atmospheric dispersion factors, dose calculations can still be demonstrated as conservative.
- Emergency preparedness and planning developed with off-site data and match regulations and guidance by operation.
  - Ultimate reliance is still the on-site MET tower during operation. Multi year on-site data still available prior to operation.
- Site atmospheric dispersion characteristics must be evaluated, and dispersion parameters established such that
  - Radiological effluent release limits can be met
  - 10 CFR 50.34 dōse criteria are met.

Guidance documents

- SRP
  - **Chapter 2, “Site Characteristics and Site Parameters”**
  - **Chapter 11, “Radioactive Waste Management”**
  - Chapter 12, “Radiation Protection”
  - Chapter 15, “Transient and Accident Analysis”
  - Chapter 19, “Severe Accidents”

- Recommends a description of the general regional climate, annual and seasonal frequencies of severe weather events, and site air quality.
- Climate and air quality information can be obtained from multiple mesonet locations and NOAA-NCEI historical airport data.
- Use of multiple data sources results in a better understanding of the site.

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- Dispersion factors, and subsequent doses, can be calculated using stability classes generated by the Turner method for the CPA.
- Mesonet data can comprehensively inform plume evolution beyond a single on-site tower, but on-site tower will remain primary source of data for operation.
- Control room designed such that habitability is retained in limiting case releases.
- Technical specifications may be generated based upon representative regional data

Atmospheric Dispersion

- RG 1.111
- RG 1.145
- RG 1.194
- RG 1.249
- RG 1.23

- RG 1.111: Mentions that off-site data may be used.
- RG 1.145: Turner method would need to supplement atmospheric stability calculations.
- RG 1.194 & RG 1.249: Off-site data and Turner method used for planning and CPA, planned for integration of a MET tower.
- RG 1.23: would be followed post CPA.

Precedent

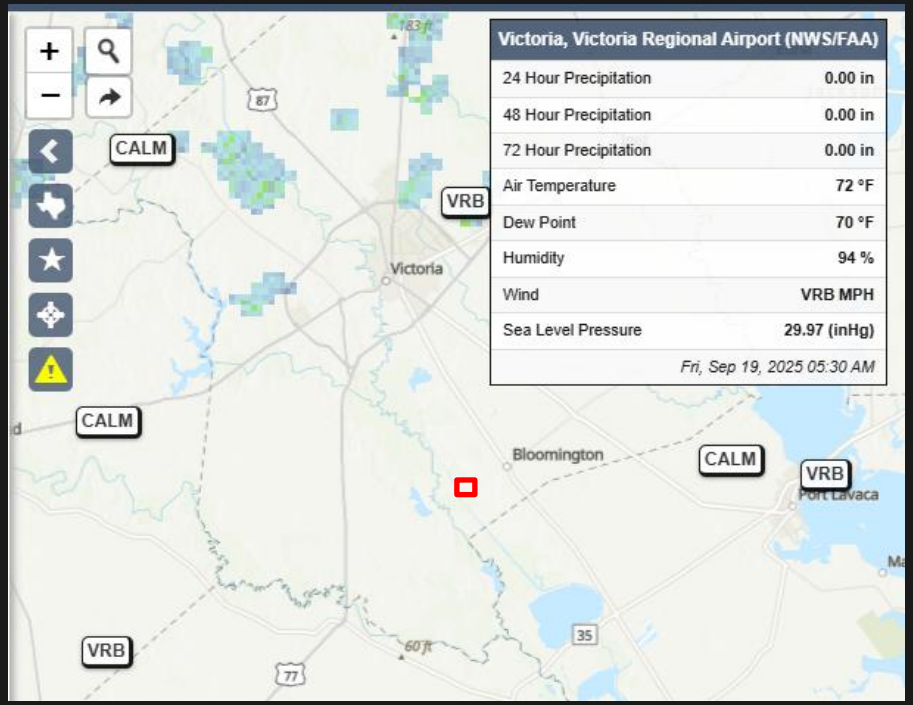
- SHINE Medical Technologies went into operation without a MET tower.
- Nuclear Energy eXperimental Testing Laboratory (NEXT) relied on regional data from an airport.
- Long Mott Energy, LLC – Long Mott Generating Station has submitted a CPA with regional data.
    - 12 miles from our site and an SMR.

Off-site Data

- Various sources exist.
  - Mesonet
  - NOAA
  - NCEI
- Airport data typically contains horizontal visibility, wind speed/direction (≤10 m), cloud cover/height, dry bulb temperature, humidity, and precipitation.
- Multiple sites can be used to increase understanding of weather patterns and to develop an EP.
- Wind speed:
  - Winds are measured at one vertical level at airports.
  - Airport towers have anemometers at <10m.
  - Mesonets may vary in height, but this is a recorded parameter.

Site

- Victoria, Victoria Regional Airport (National Weather Service (NWS)/Federal Aviation Administration (FAA)) | KVCT **-14.5 miles**
- Port Lavaca - Calhoun County Airport (NWS/FAA) | KPKV **-16 miles**
- Parks Ranch Goliad (The Texas Water Development Board (TWDB)) – **20 miles**
- Duke Ranch (TWDB) – **22 miles**
- X-Energy, Long Mott Site – **13 miles** (for information only. Not included in licensing actions at this time)



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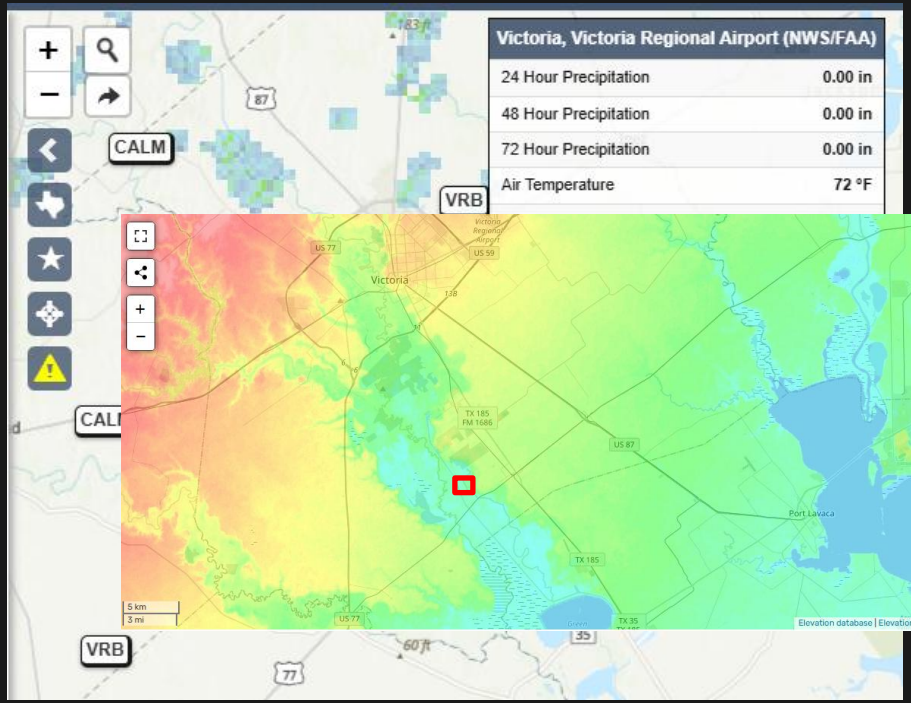
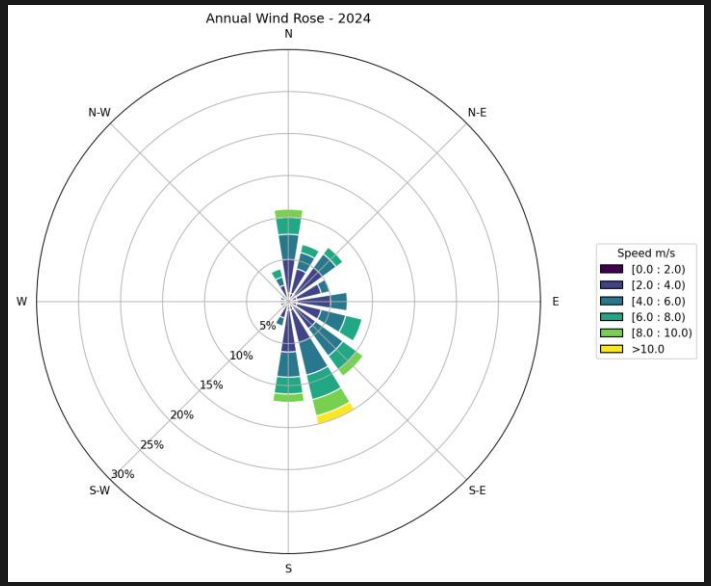
- All well within 100 ft elevation.

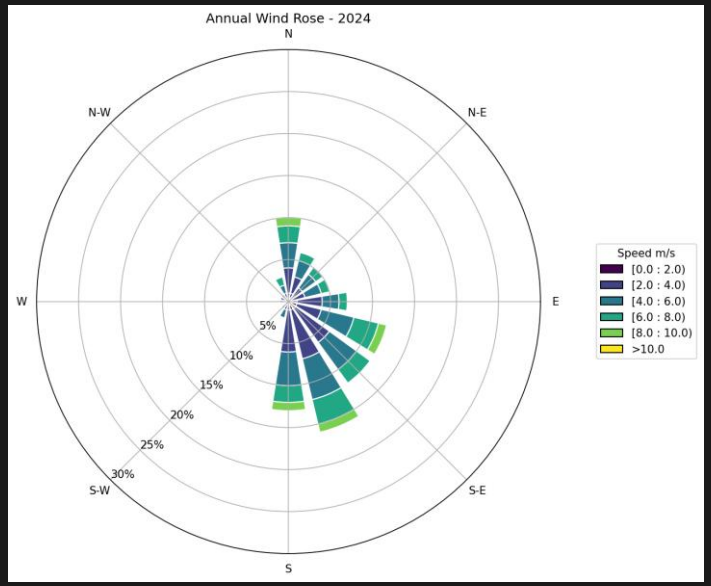


Annual 2024 Wind Roses

KVCT (Victoria)



KPKV (Port Lavaca)



Monthly 2024 Wind Roses

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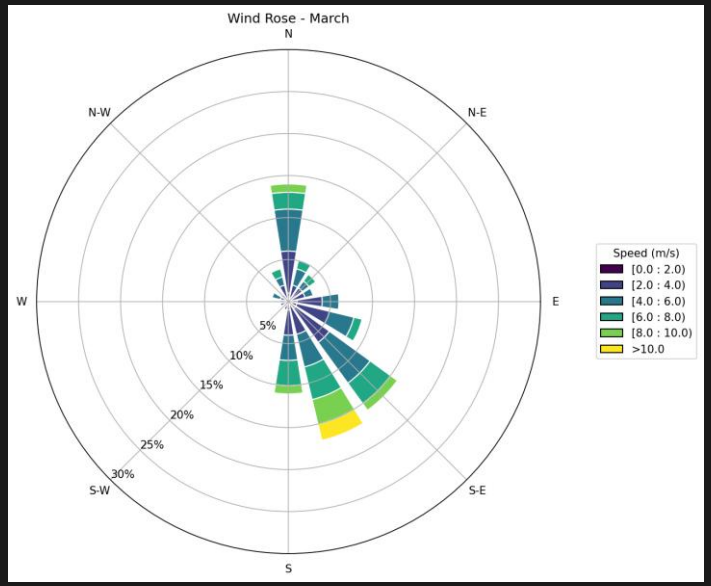

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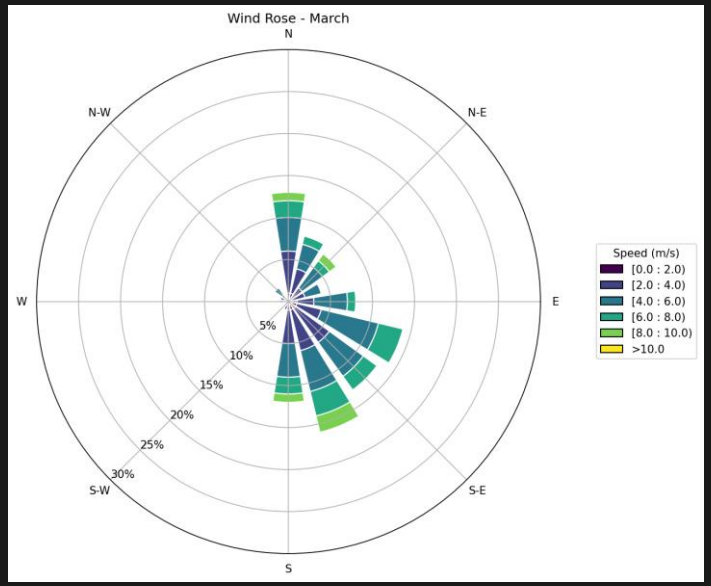
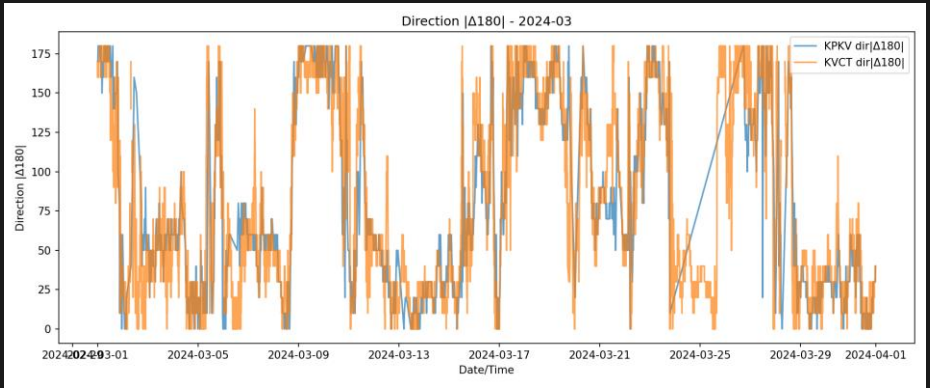
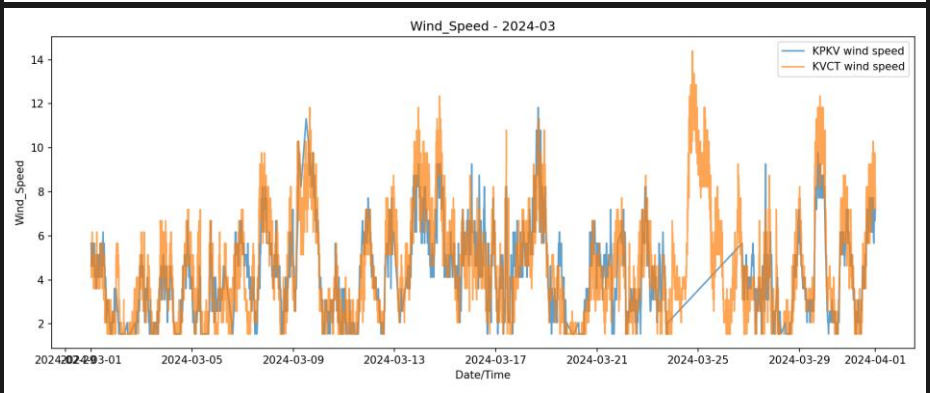


Monthly 2024 Time Series



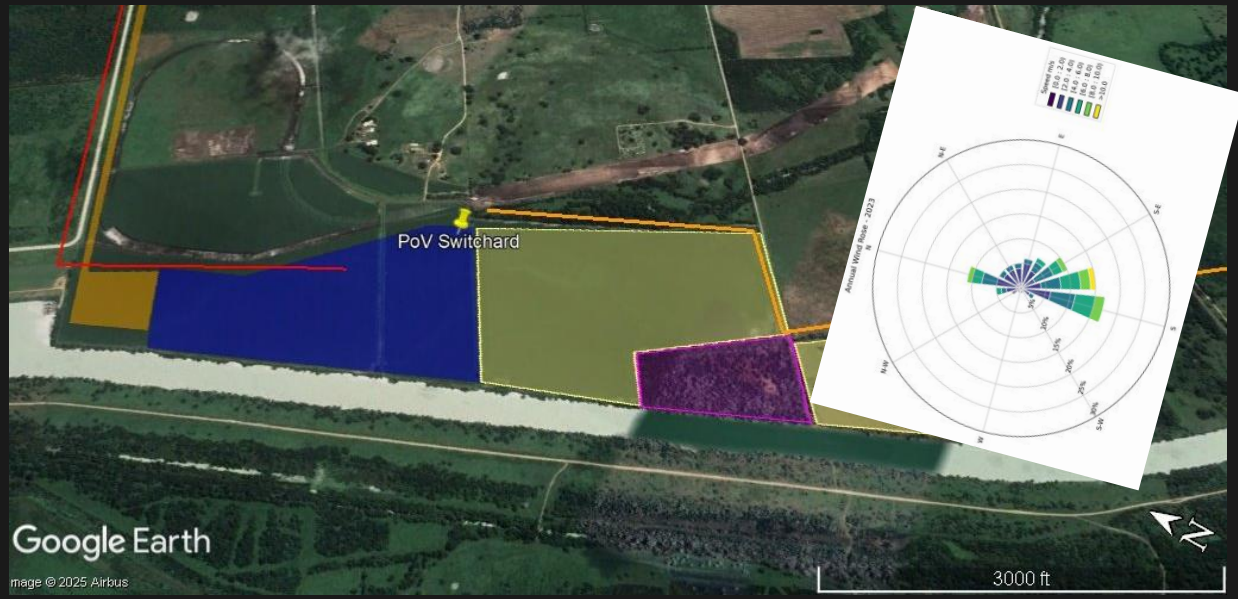


Methodology

- Pure reliance on available off-site data inform construction permit.
- Plan to build MET tower during construction based on RG 1.23.
- Three data sources considered from the regional area.
- Data should be used to inform the site climatology to the best of the data's abilities.
- Conservative transport and dispersion conditions are used based on regional data and refined with on-site data for OLA.

Open discussion and questions

Thank you for your time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Google Earth
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3000 ft
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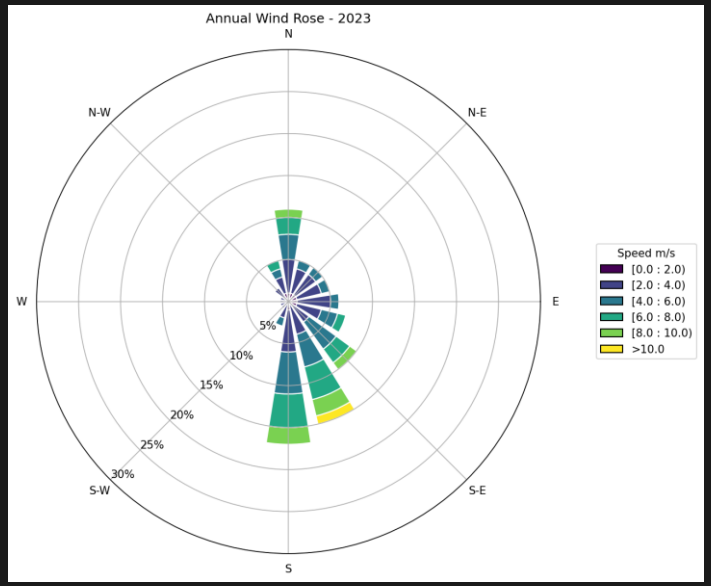
Supplementary Data

Annual 2023 Wind Roses

KVCT (Victoria)



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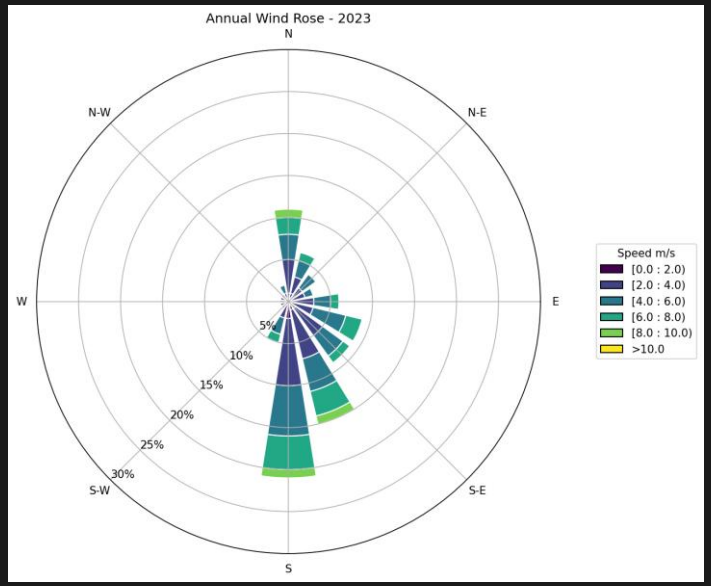

Annual 2025 Wind Roses

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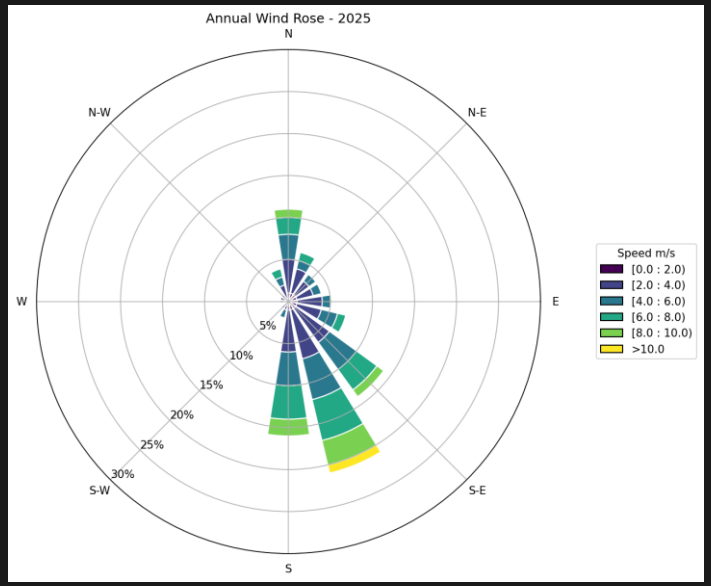
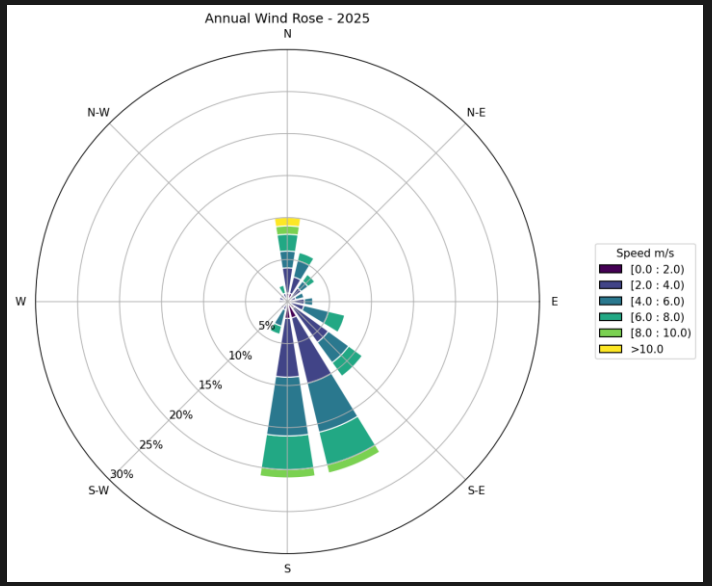


KPKV (Port Lavaca)



Monthly 2024 Wind Roses

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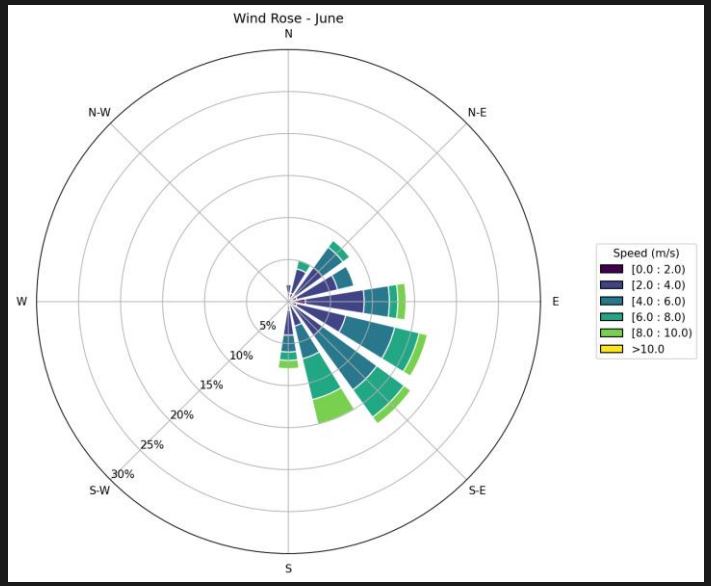

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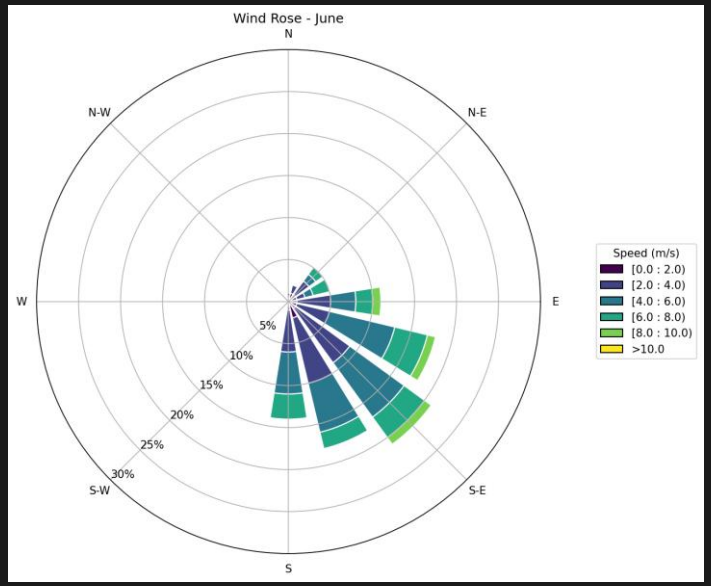

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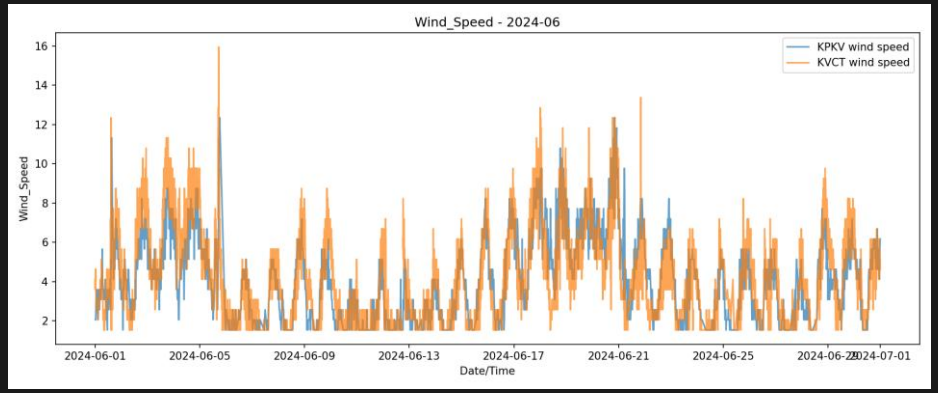

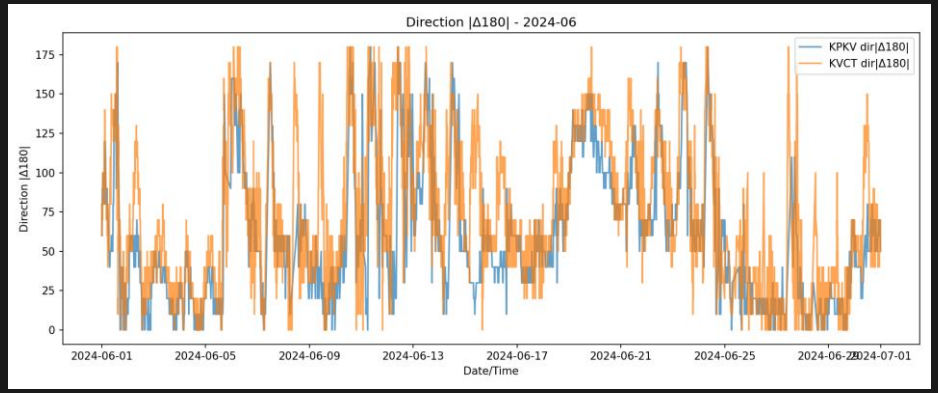

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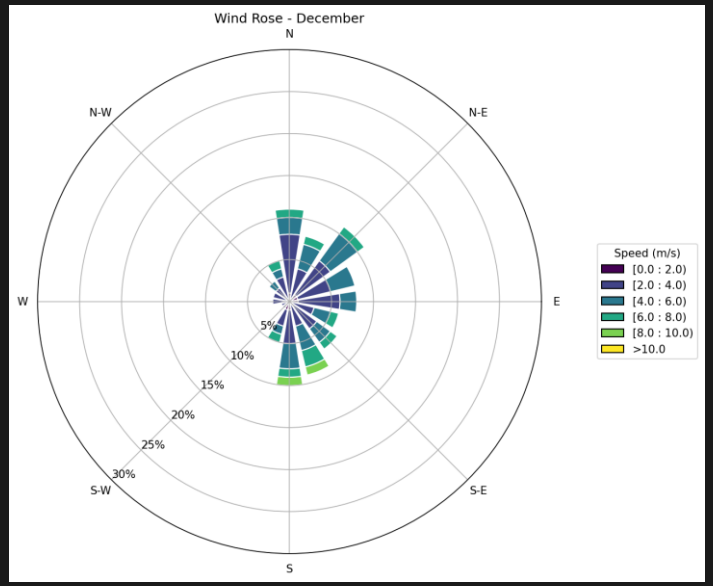

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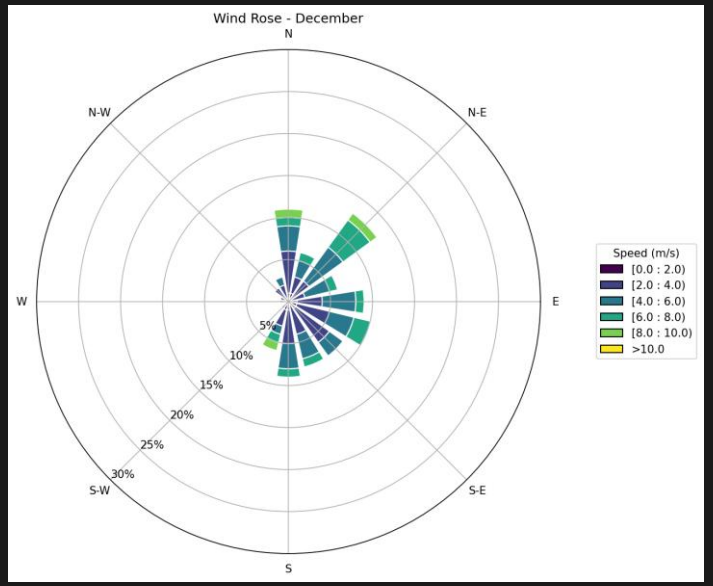

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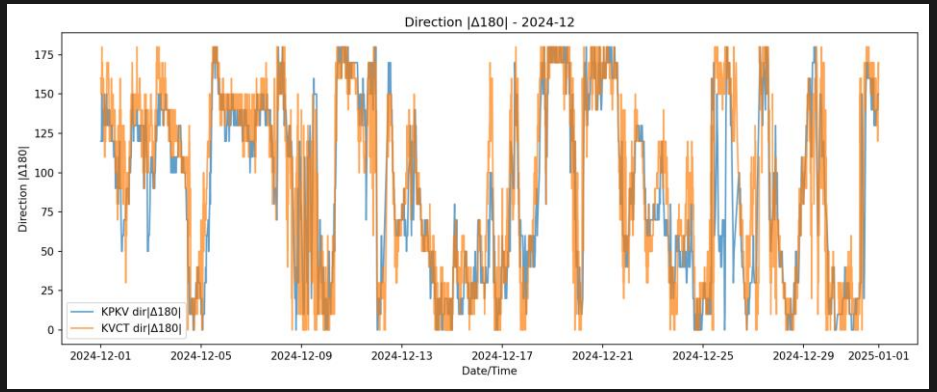

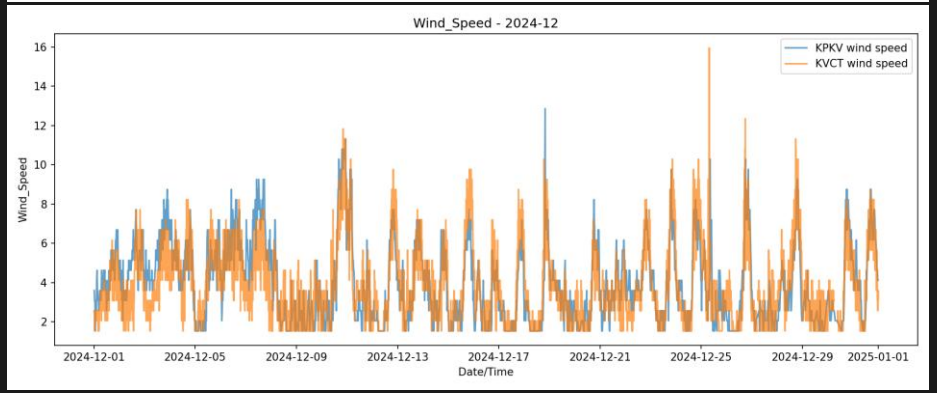

Site

- Elevation map shows <100 ft elevation change between regional mesonet locations
- Victoria, Port Lavaca
- No stark land features

Supplemental Data