

# Vermont Mesonet - A Statewide, Meteorological Monitoring Network

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## Intro:

- Vermont ranks 7th place nationally in federal disaster declarations due to recent extreme weather and ranks 4th place in disaster declarations from 2011-2024 (*Vermont Atlas of Disaster, 2024*).
- Complex terrain in Vermont limits National Weather Service radar coverage east of the Green Mountains (*fig 1*).
- Need for statewide, high resolution, real-time meteorological data is increasing.
- UVM's Leahy Institute granted seed funding for 2 prototype stations, kickstarting the Vermont Mesonet.
- The Vermont Mesonet will fill the gaps in meteorological monitoring for the state.
- The network will consist of 20 – 22 stations; a minimum of one per county.

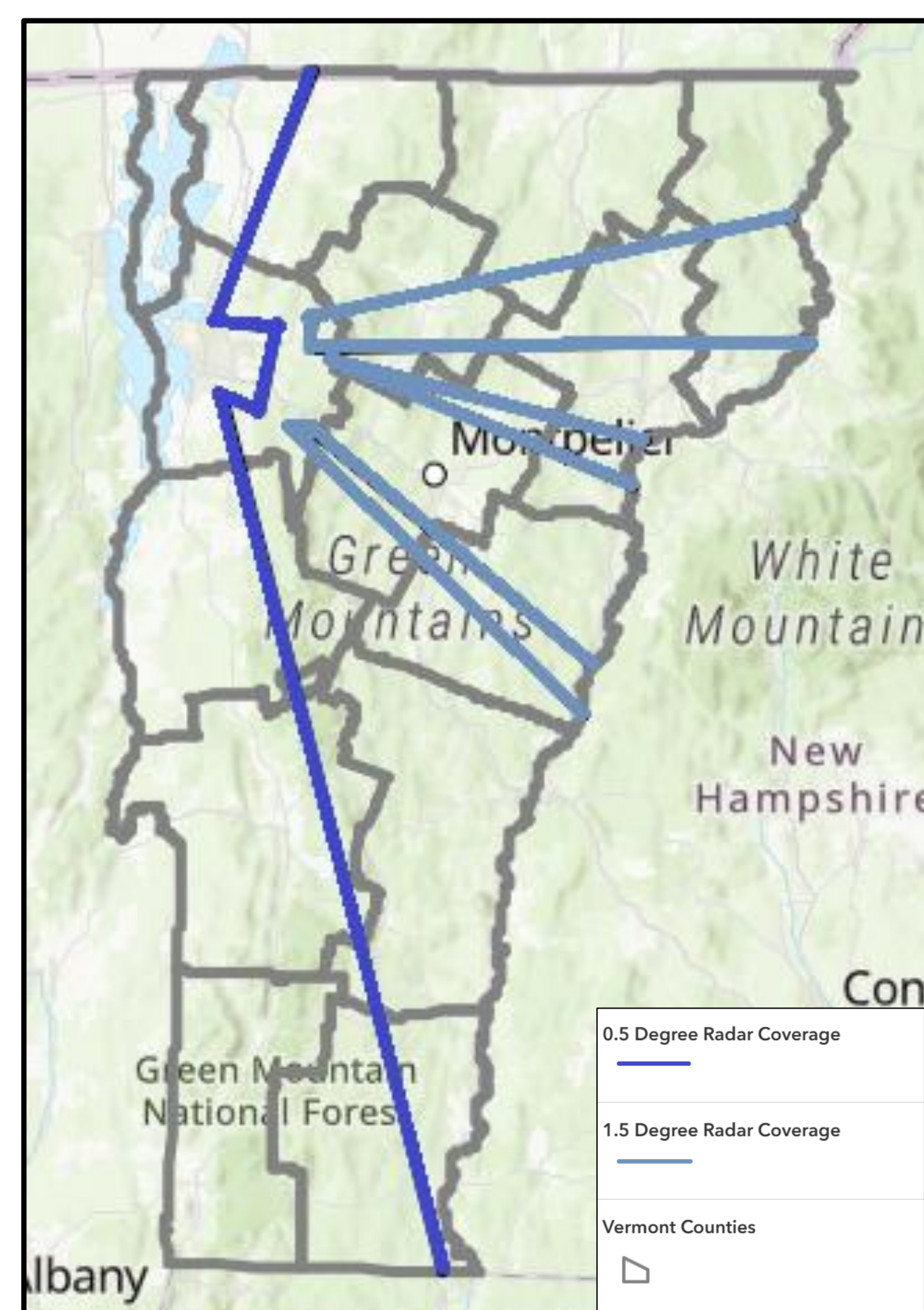


Figure 1. National Weather Service radar coverage gaps



## Data will serve...

- **Emergency services:** Assist in warnings and decision making
- **Education:** Create hands-on curriculums and learning opportunities for K-12 and undergraduate students
- **Agriculture:** Provide data for agricultural planning
- **Transportation:** Inform decisions during hazardous road conditions
- **Recreation & Tourism:** Provide real-time weather data for hiking and winter sports
- **Utilities & Energy:** Provide data that will help predict energy demands, manage power grids, and pinpoint outages for extreme events

## Methods:

- A site suitability analysis was conducted, following the World Meteorological Organization (WMO) requirements while balancing the needs of shareholders.
- Waterbury and Lyndon were the first two towns chosen based on the needs and recommendations of the National Weather Service, Vermont Dam Safety, and Vermont Agency of Transportation.
- Instrumentation is selected based on WMO suggestions and neighboring observation networks to create Northeast synergies.
- Each weather station will contain a 10m high tower with soil sensors measuring as deep as 0.5m. Orientation of each station will remain consistent through the whole network (*fig. 2 & 3*).
- Most data will be sampled at a 3-5 second interval with data packages sent every 5 minutes through cellular communication.
- Data will be transmitted directly to the National Weather Service and the Meteorological Assimilation Data Ingest System (MADIS) while undergoing internal QA/QC.
- Mesonet data will be supplemented by the Summit to Shore network to provide measurements along elevational grades and forested land types.

Figure 3. Proposed Weather Station Design

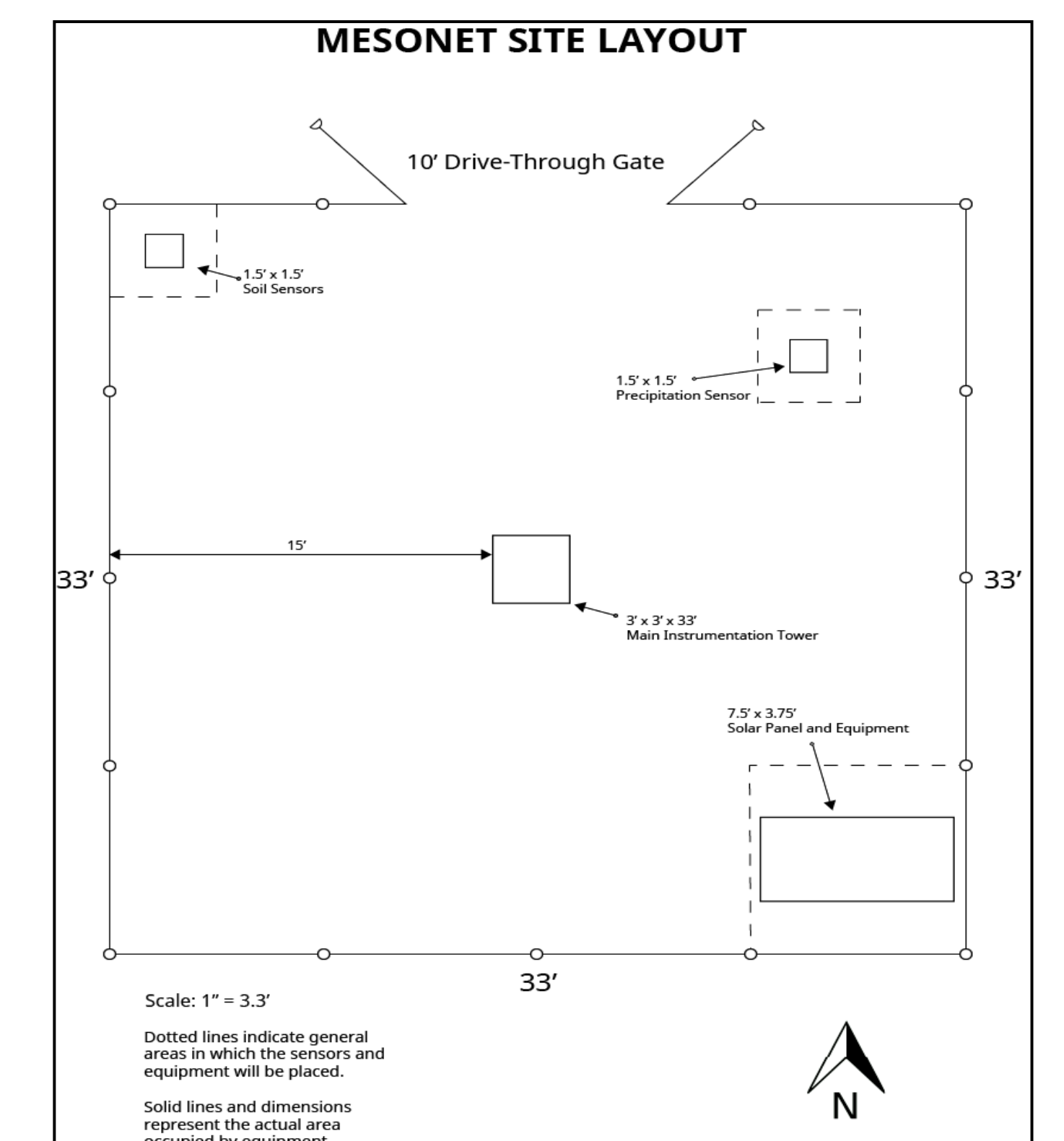
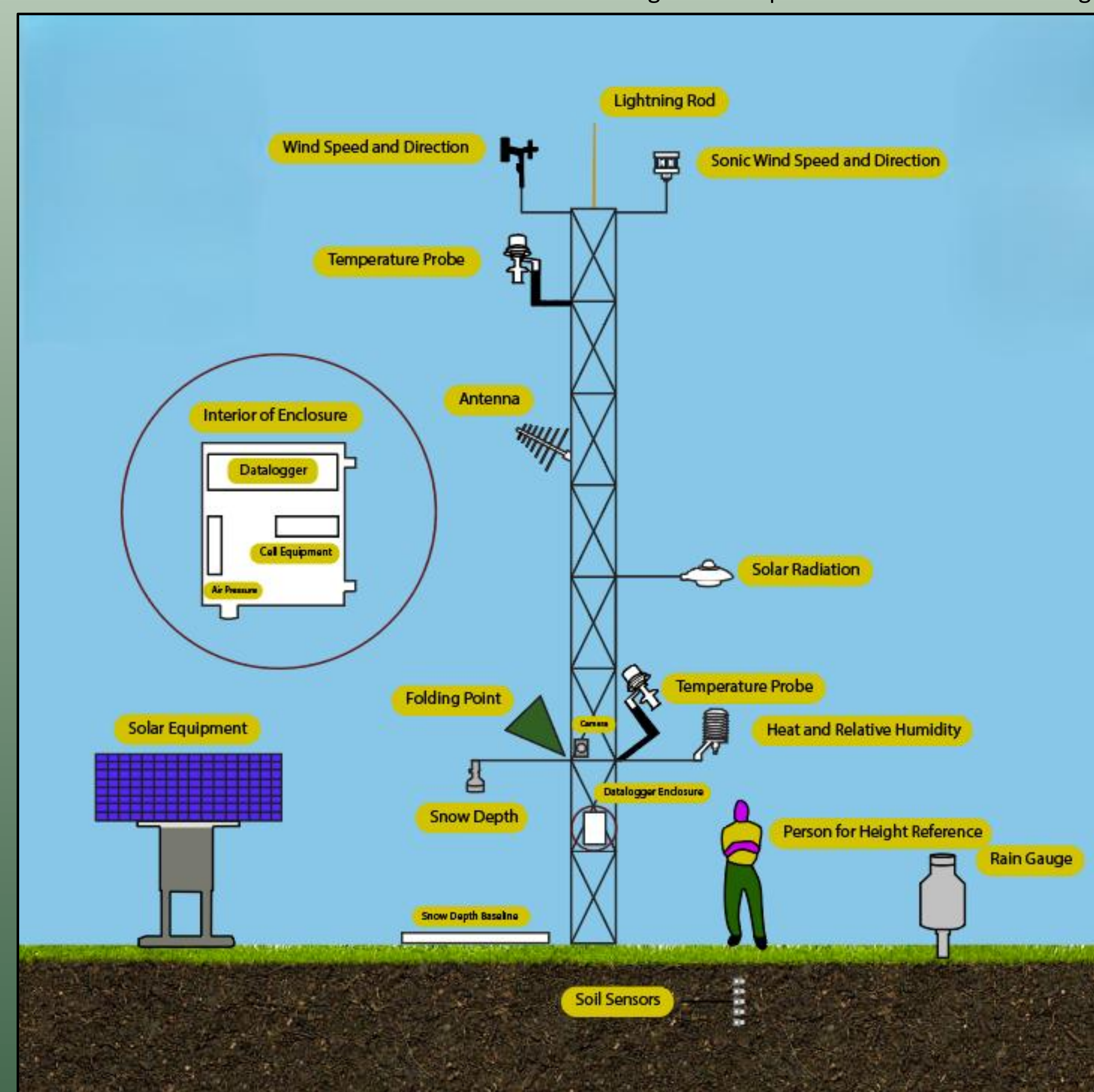


Figure 2. Station Layout for each location