

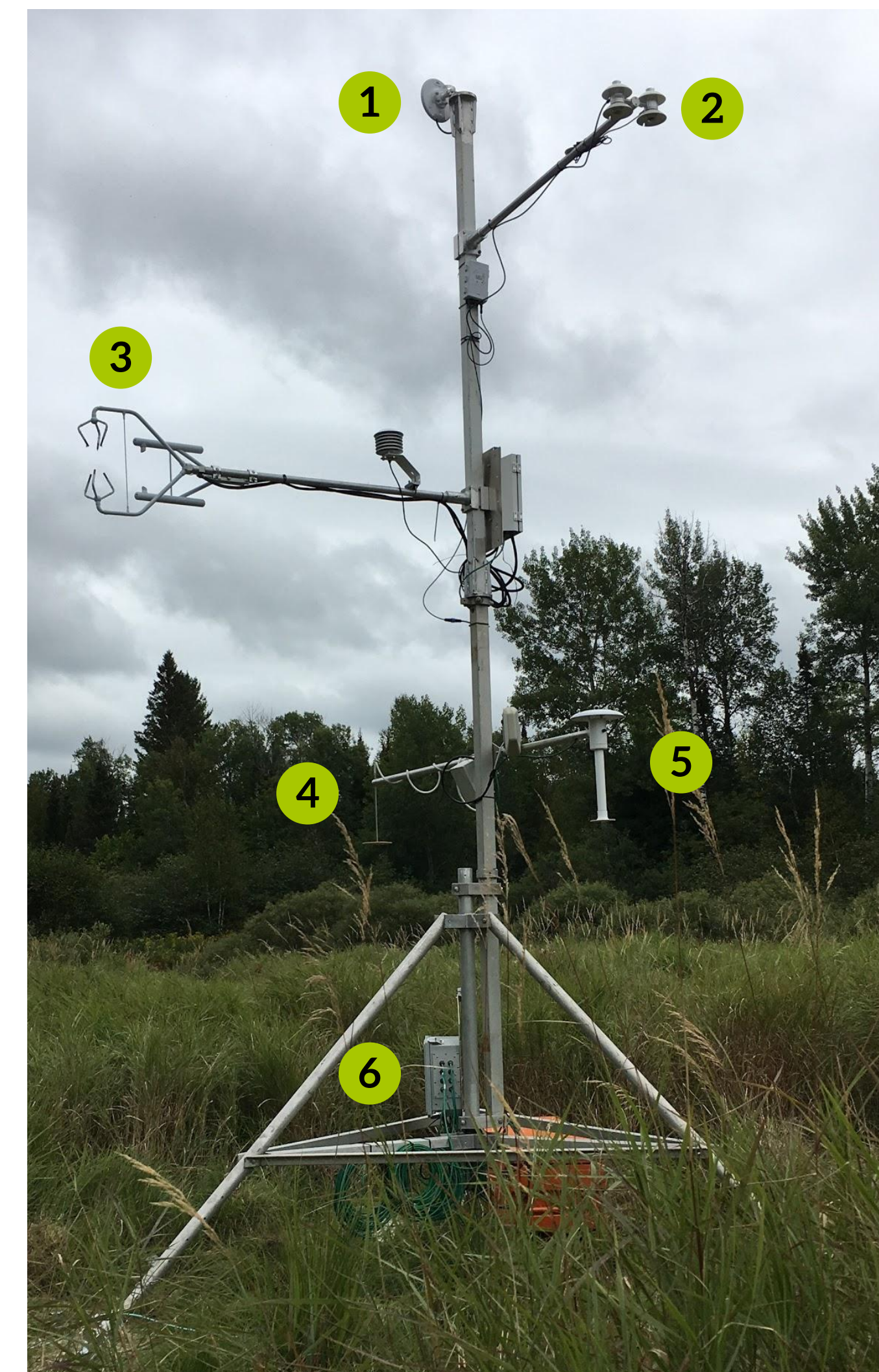
# A simple web interface for data sampling module diagnostics

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## Background

- The Integrated Surface Flux System (ISFS) uses a network of Data Sampling Modules (DSMs) to measure the Earth's surface.
- A DSM is a Raspberry Pi computer, in a weatherproof box, that collects samples from its attached sensors.
- Operators currently use command-line tools to view recent data from the sensors and the DSM.
- Manually fetching and interpreting that data is slow and inconvenient, especially when dealing with many DSMs.



ISFS tripod deployed at NW3 site for 2019 CHEESEHEAD project.

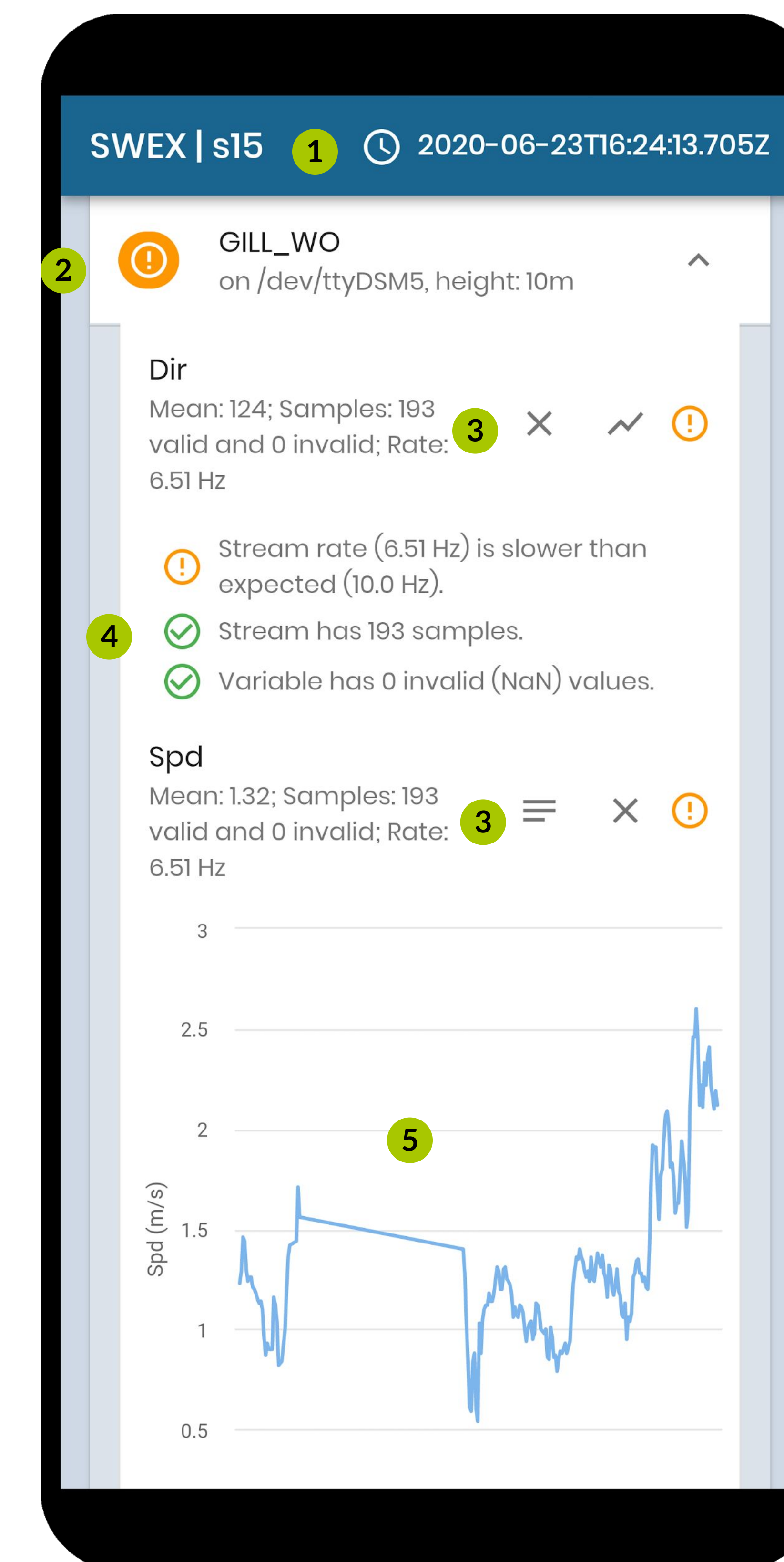
### Components:

1. WiFi radio
2. 4-component radiation sensor
3. 3D sonic anemometer
4. Pressure port
5. TRH (temperature & humidity sensor)
6. DSM

## DSM Dashboard

### Web interface features:

1. Field Project, DSM name, and data timestamp.
2. Sensor name, location, and overall status.
3. Summary information for each measured variable.
4. Checks that the data matches what is expected.
5. Automatically updated plot of live data.



## Results

- The DSM Dashboard project provides a web page to be installed along with field project software.
- The DSM Dashboard will be deployed in upcoming field projects.
- Scientists and operators can browse to the web page, served directly from the DSM, on their computers or cell phones.
- The interface prioritizes potential issues and filters information so operators can focus on what is most important.
- The code is based on the React, so the ISFS team can standardize on a single web framework.
- The project established a JSON format for exchanging data and diagnostic information.

## Future Work

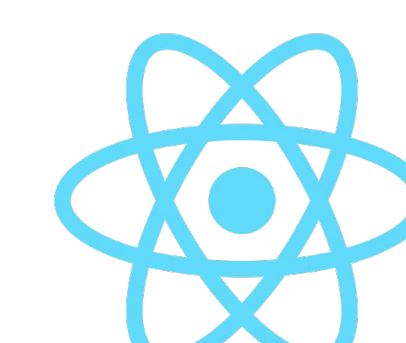
- Display additional health metrics, such as
  - disk usage,
  - network connections,
  - GPS time synchronization.
- Add controls to restart misbehaving sensors from the browser.
- Record status information and send notifications when errors appear.
- Keep track of regular maintenance actions and events.

## Objectives

Create a web interface that

- displays collected measurements and statistics,
- displays whether the devices are operating as expected,
- works on mobile devices.

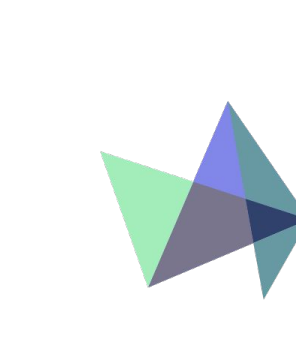
## Tools



React



Material-UI



Highcharts



NGINX



Ansible

## Acknowledgements

Thanks to

- my mentor, Gary Granger, for his guidance.
- the rest of the ISFS team for their suggestions,
- the SUPER coordinators for their support.



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