

# XPIA: Developing Remote Sensing Techniques for Renewable Energy Applications

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## Program Overview

### Background



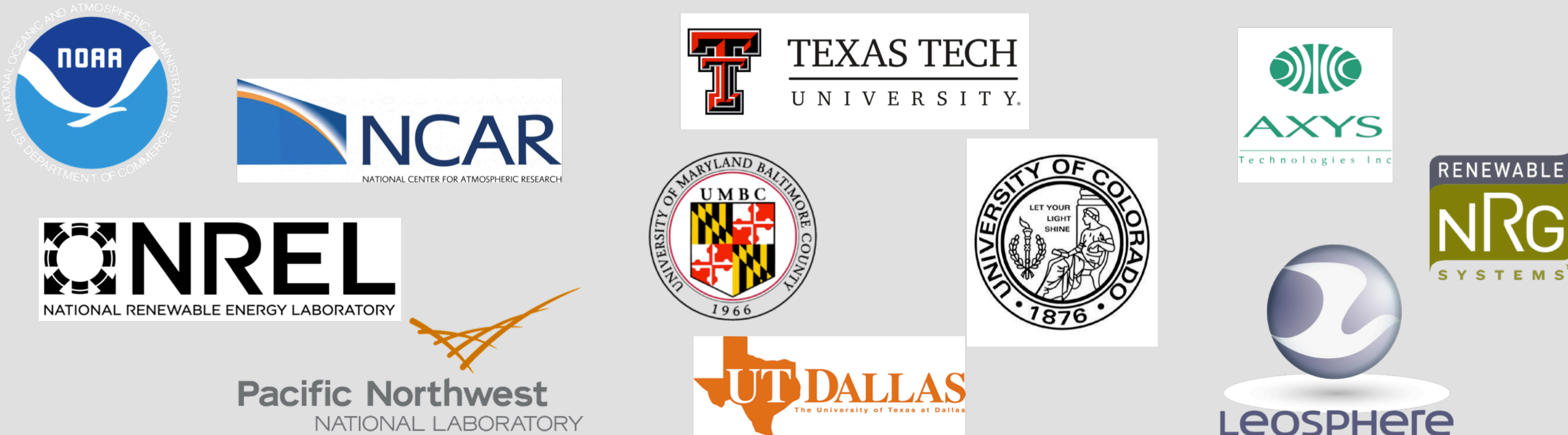
- Better understand physics of winds into and through a wind plant
- Improve modeling and prediction of wind energy
- Reduce cost of wind energy

### Objectives

- Compare PBL measurement techniques
- Evaluate instruments intended for future experiments
- Encourage participation by external stakeholders to engage in the instrument comparison process

## Collaborators

Government - University - Private Industry

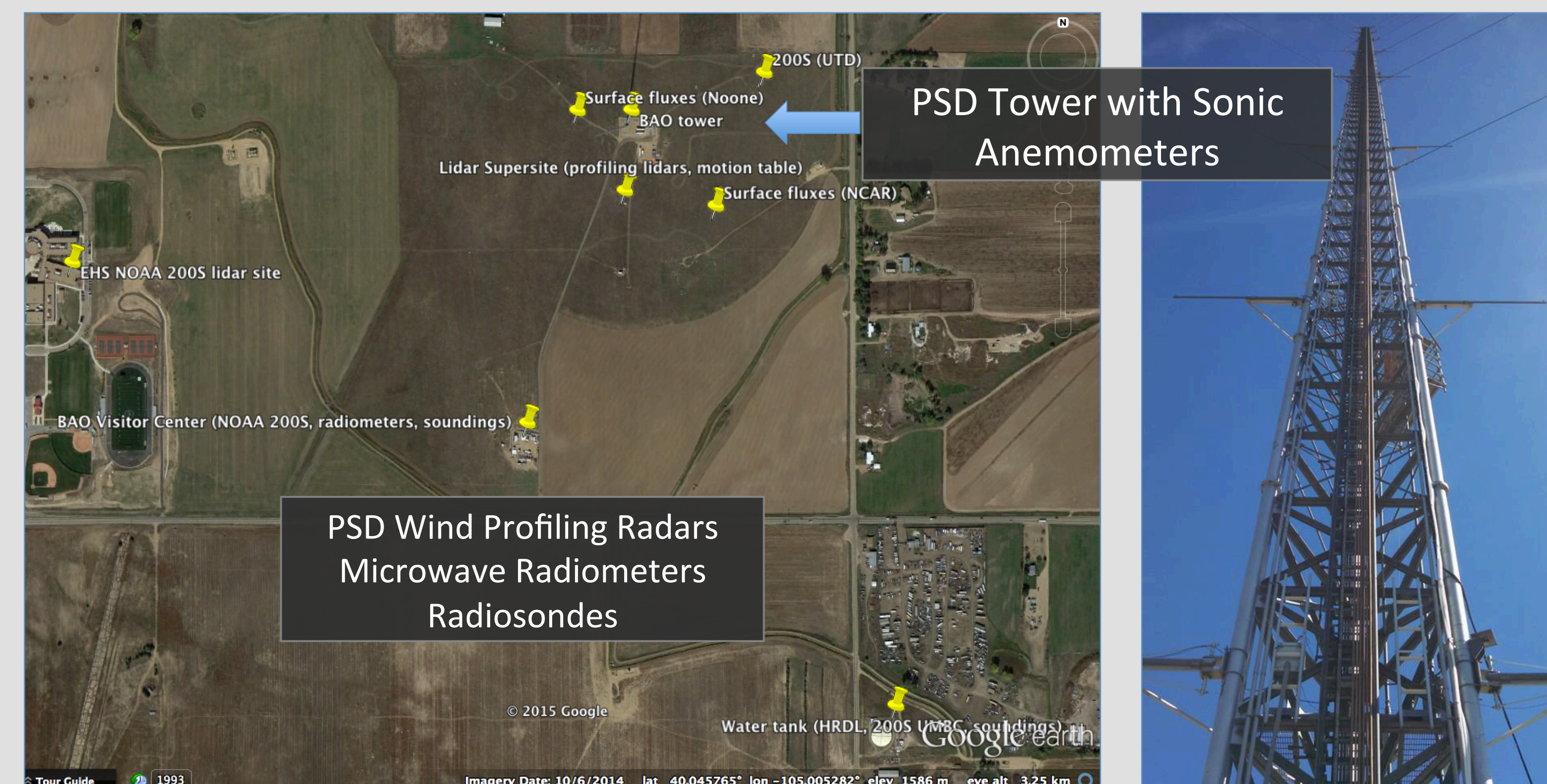


## Goal

To assess remote sensing instrumentation for their temporal and spatial resolution capability to capture PBL and intra-array wind plant flow characteristics for validation and verification of mesoscale, LES, and wind plant flow models

## Field Observations

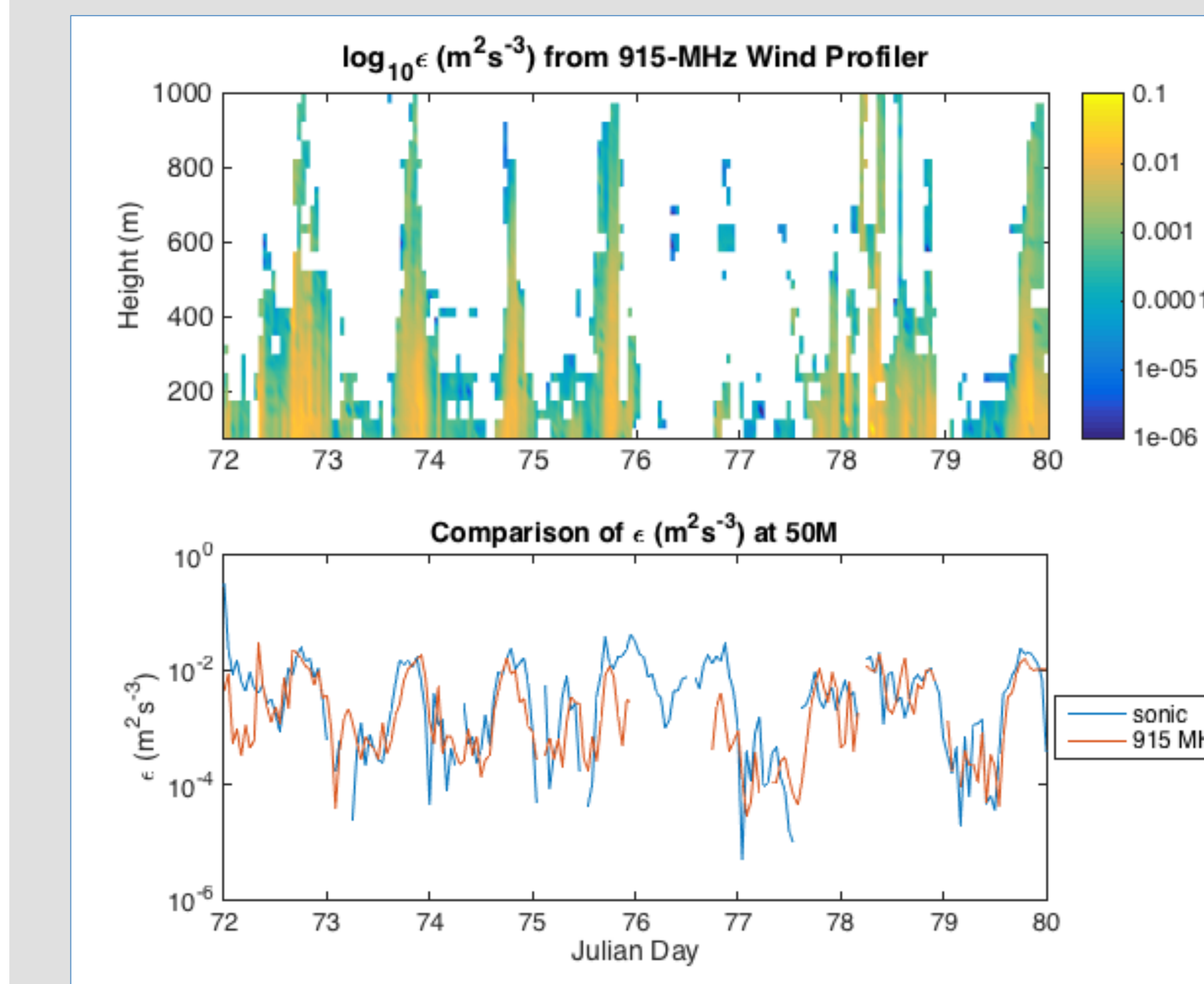
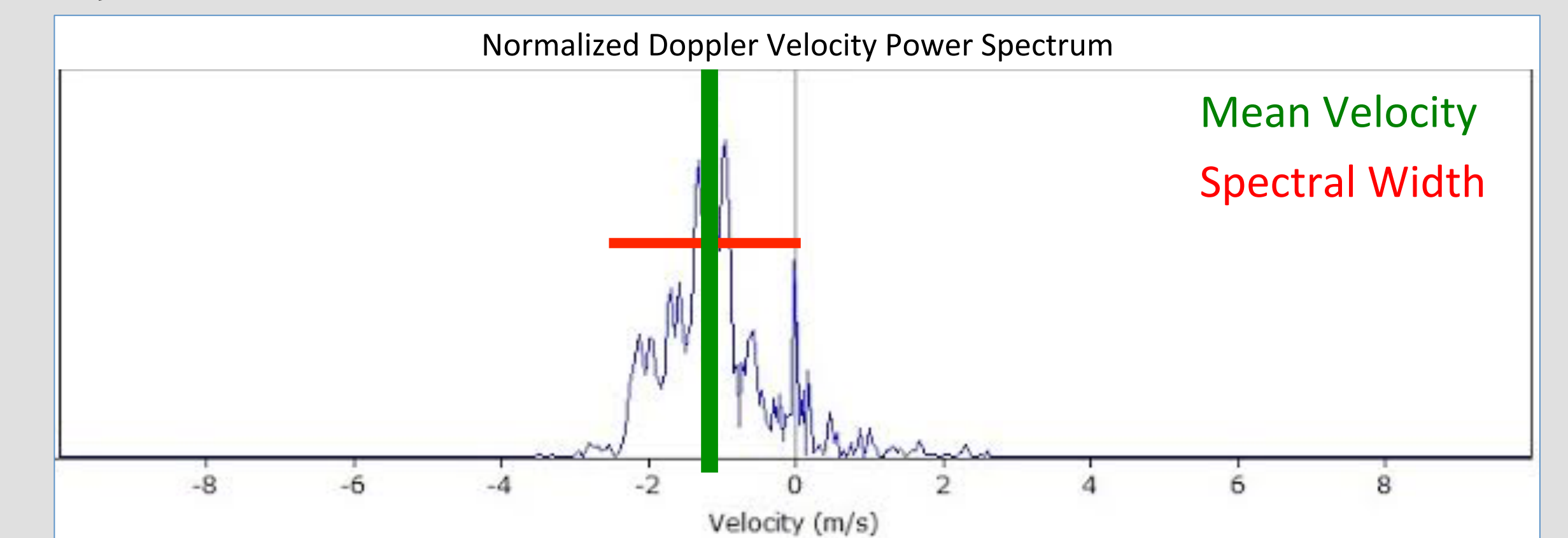
- PSD's Boulder Atmospheric Observatory with 300m Tower
- March & April 2015
- [a2expia.blogspot.com](http://a2expia.blogspot.com)
- Archived by 30 Sept 2015; open to non-investigators 1 Apr 2016



Boulder Atmospheric Observatory, Erie, CO 300m tower

## PSD Highlights: Turbulence from Wind Profiling Radars

Turbulence Dissipation Rates from Spectral Width of Doppler Velocity Spectrum



*In situ vs radar remote sensing measurements show agreement from 50 to 300m*

## Future Plans: Wind Forecast Improvement Project 2 – Fall 2015

See Wilczak talk, Wednesday at 2:25 pm