

DEVELOPING A TEMPERATURE INVERSION STRENGTH PRODUCT FOR PUBLIC HEALTH AND OTHER APPLICATIONS

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Project Objectives

- Develop a NRT temperature inversion strength product
- Use vertical temperature profiles from AIRS
- Create a website with daily NRT raster maps
- Accessible to users through website, possibly mobile app

Rationale

- Temperature inversions → poor air quality
 - Los Angeles, Salt Lake City, Denver
- Study using AIRS profiles suggest measurable health effects when inversions occur

Informal User Survey

- Potential Users
- General level of interest
- How would it be used
- Preferences for data access, data types, scale
- Other types of data of interest (e.g. air pollutants)

Potential Users

- Three types of potential users were identified

Health and the Environment

- Health Professionals: respirologists or other specialists, public health professionals
- Air quality managers: industry, government
- Require current data for specific location
 - Day to day operations
 - Mobile application - phone app

Air Quality Modelers

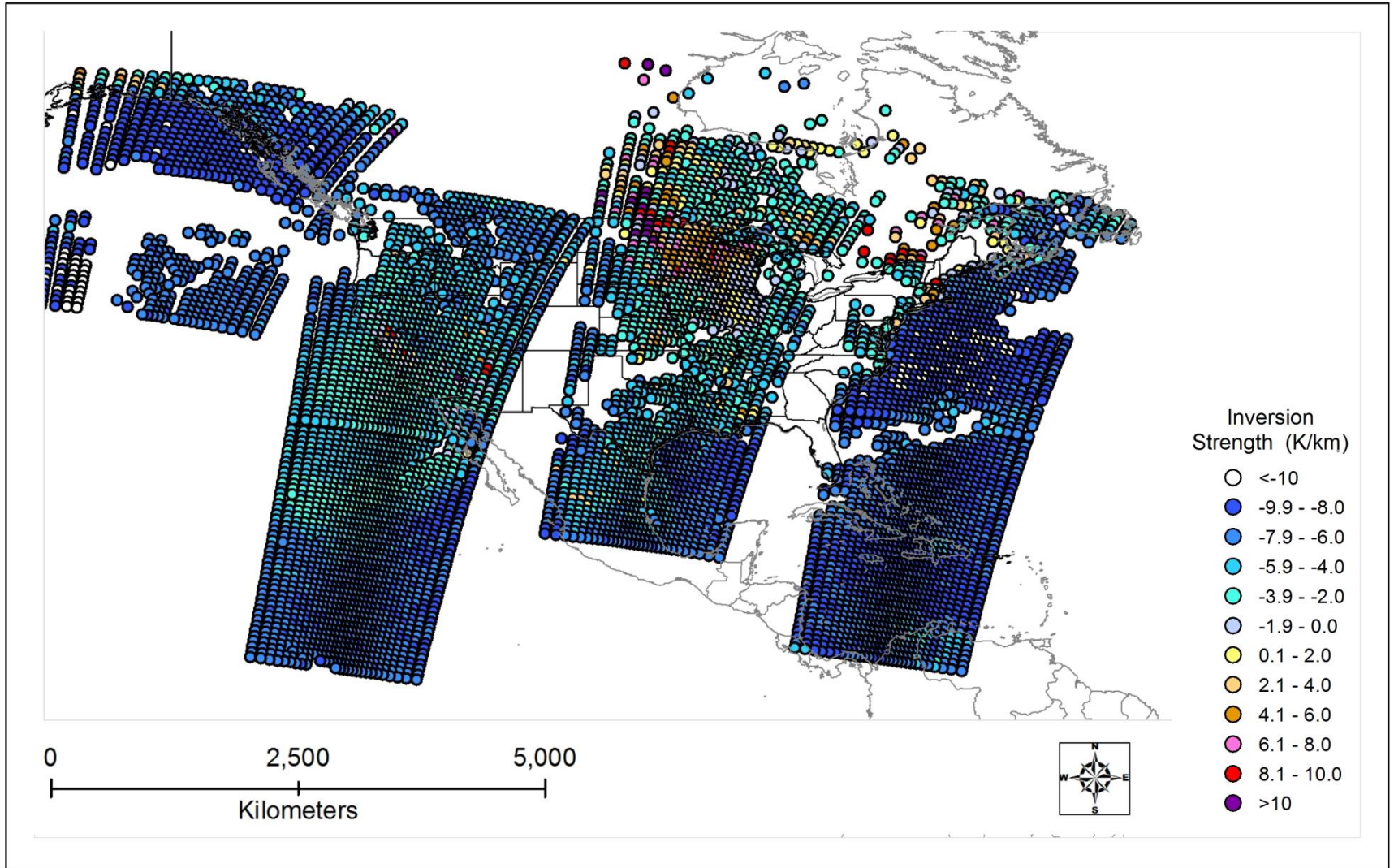
- High level technological expertise
- Require full vertical profiles for integration or evaluation of the models.
- Regional or nation-wide scale
- NRT TIS map could be used as a quick look

Researchers

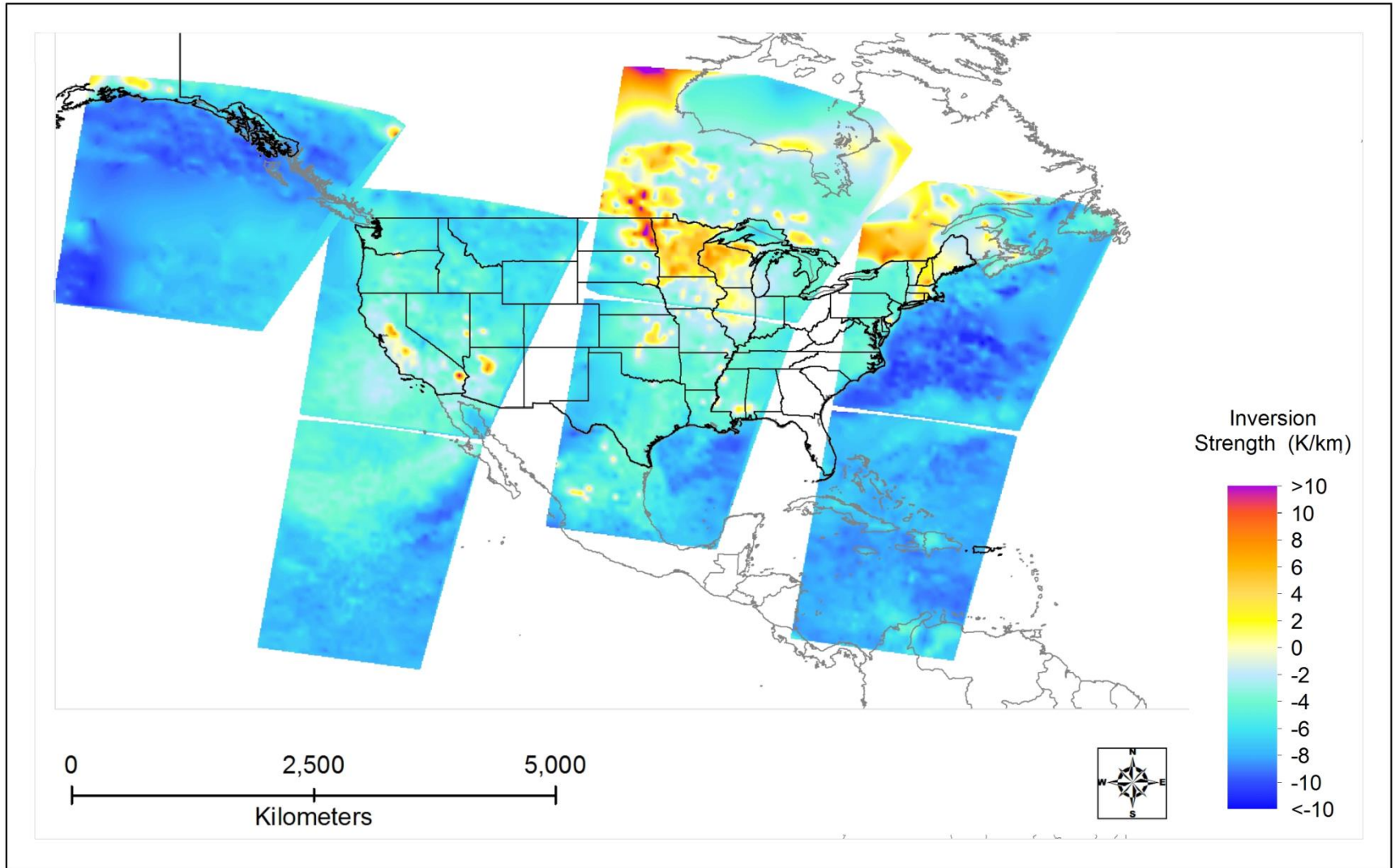
- Researchers - historical, as well as current data
- Medical specialists, epidemiologists, public health professionals, air quality modelers, air quality managers.

Creating the Inversion Surfaces

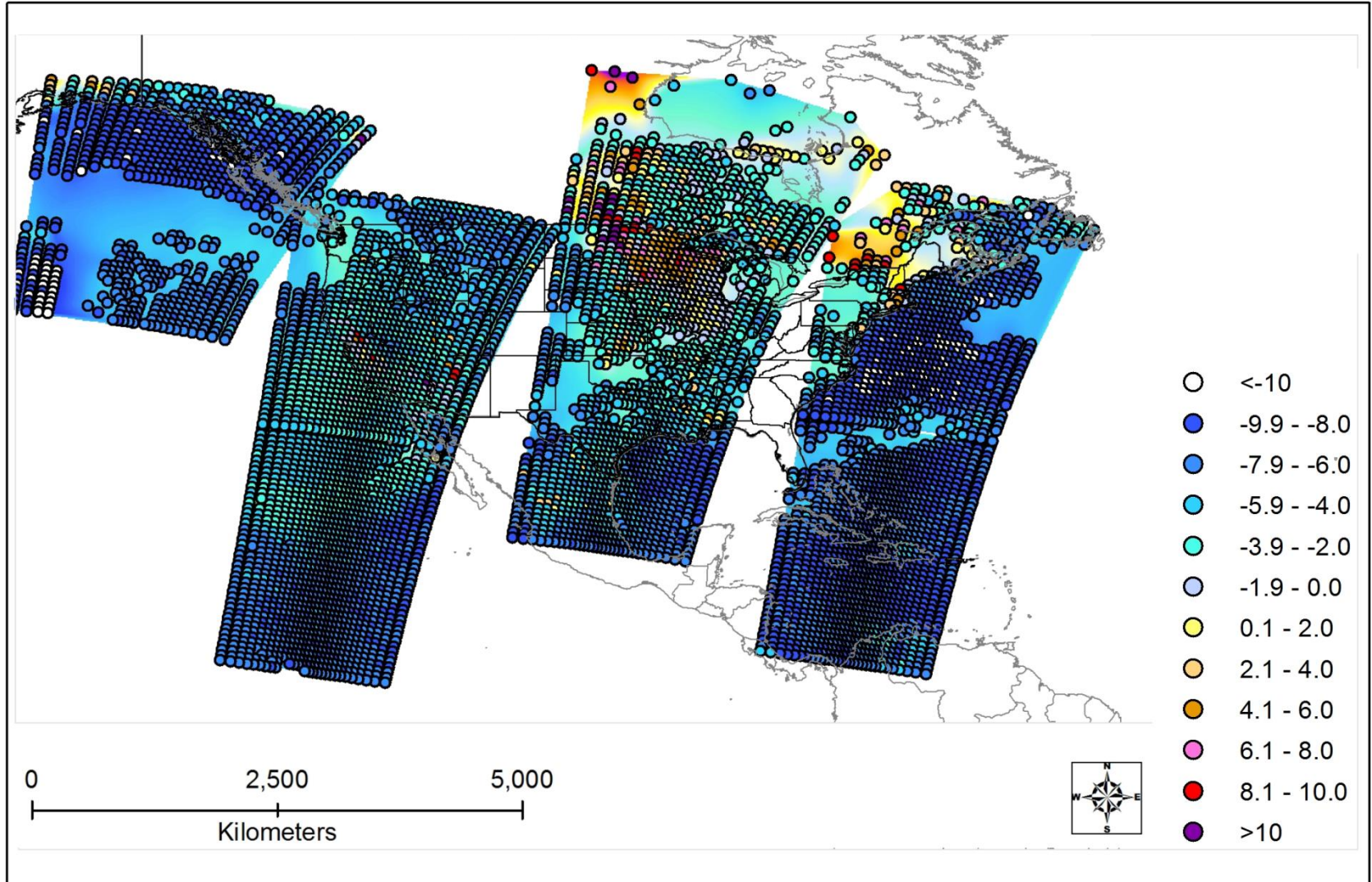
Example: January 10, 2014 - Night



Inversion Strength Surface



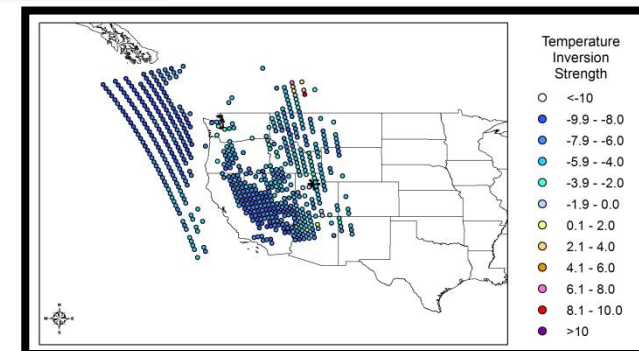
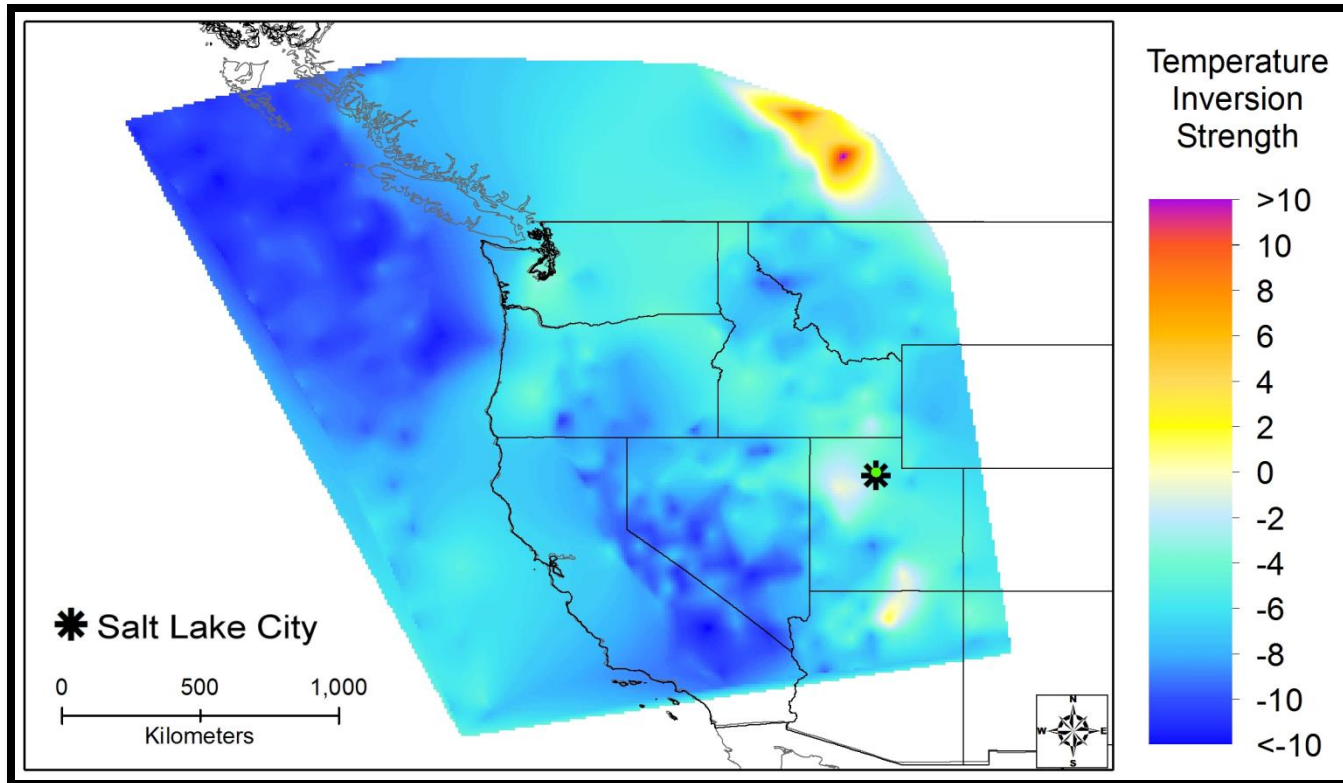
Overlay for visualization



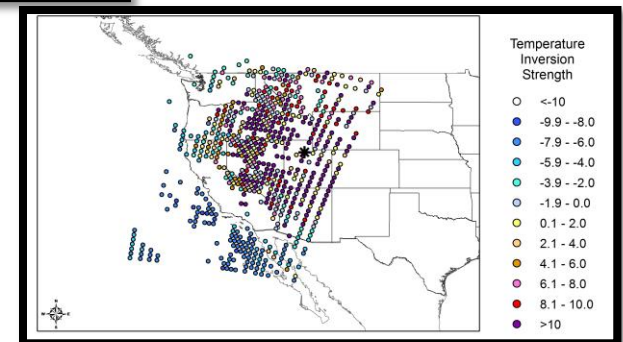
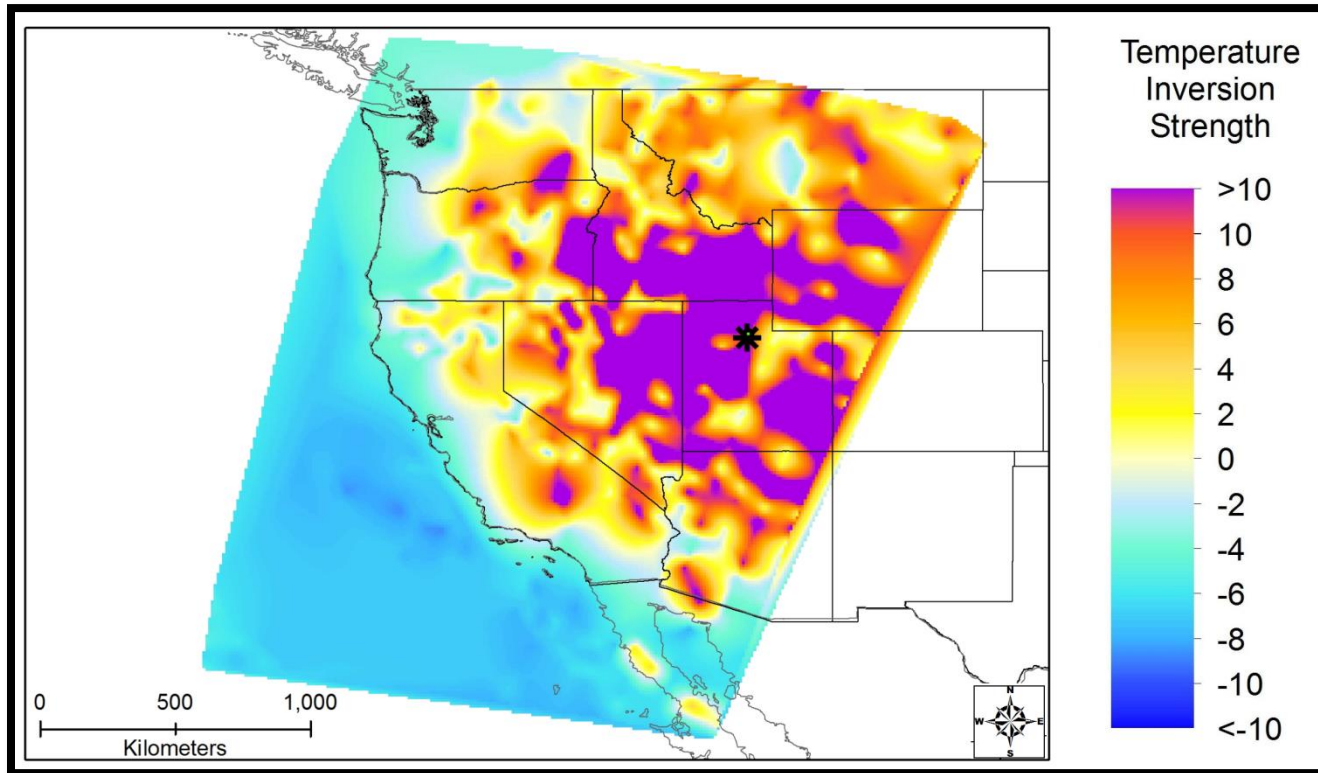
Extreme Air Quality Event

- Salt Lake City
- January 23, 2013
- Concentrations of particulate matter – 3 three times the federal clean air limit.
- *“During the peak of the inversion, temperatures were - 15.5°C (4.1°F) at the surface and 7.6°C (45.7°F) at 2,130 meters (6,988 feet), University of Utah meteorologist Jim Steenburgh reported on his blog.”*
- *Source: earthobservatory.nasa.gov/blogs/earthmatters/2013/01/29/earth-indicator-130-micrograms-of-particulate-pollution-per-cubic-meter-in-salt-lake-city/*

AIRS TIS January 23, 2013 - Day

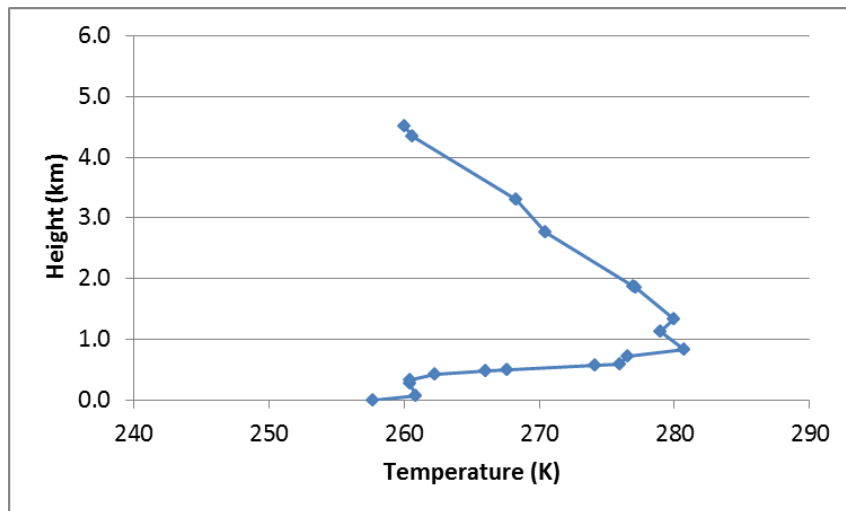


AIRS TIS January 23, 2013 - Night

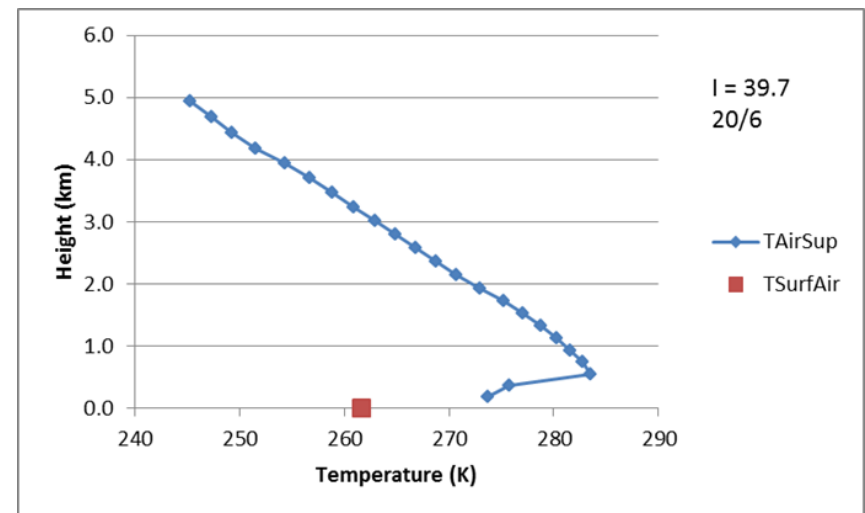


Night Profiles

Radiosonde (12Z)

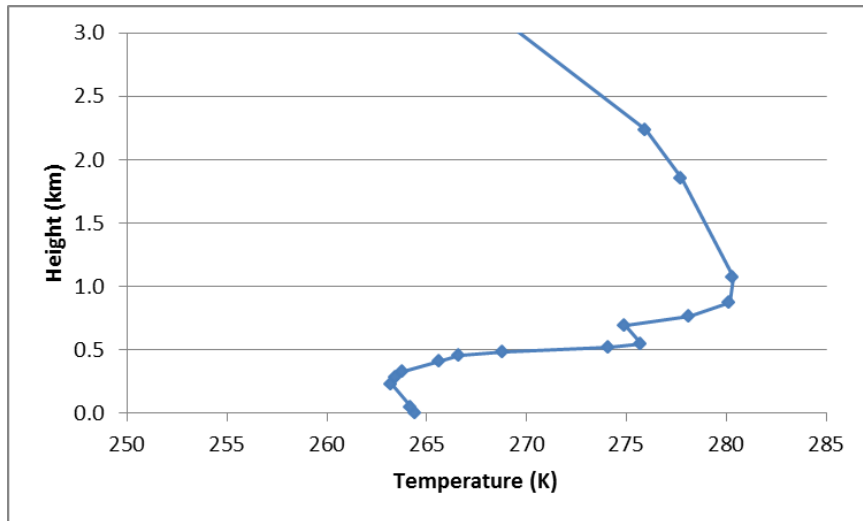


AIRS Night

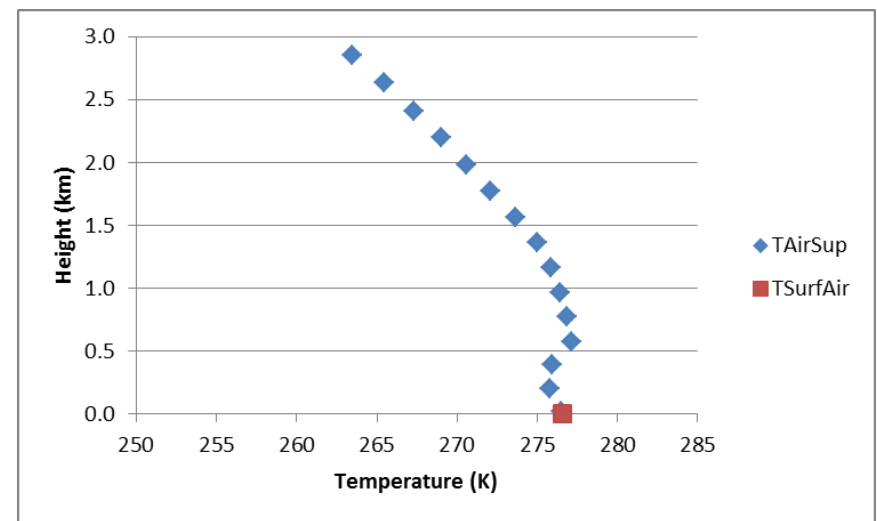


Day Profiles

Radiosonde (0Z)



AIRS Day



Future

- Finalize methodology
- Develop and test product

Thank You