Promoting water-use efficiency with Responsible AI

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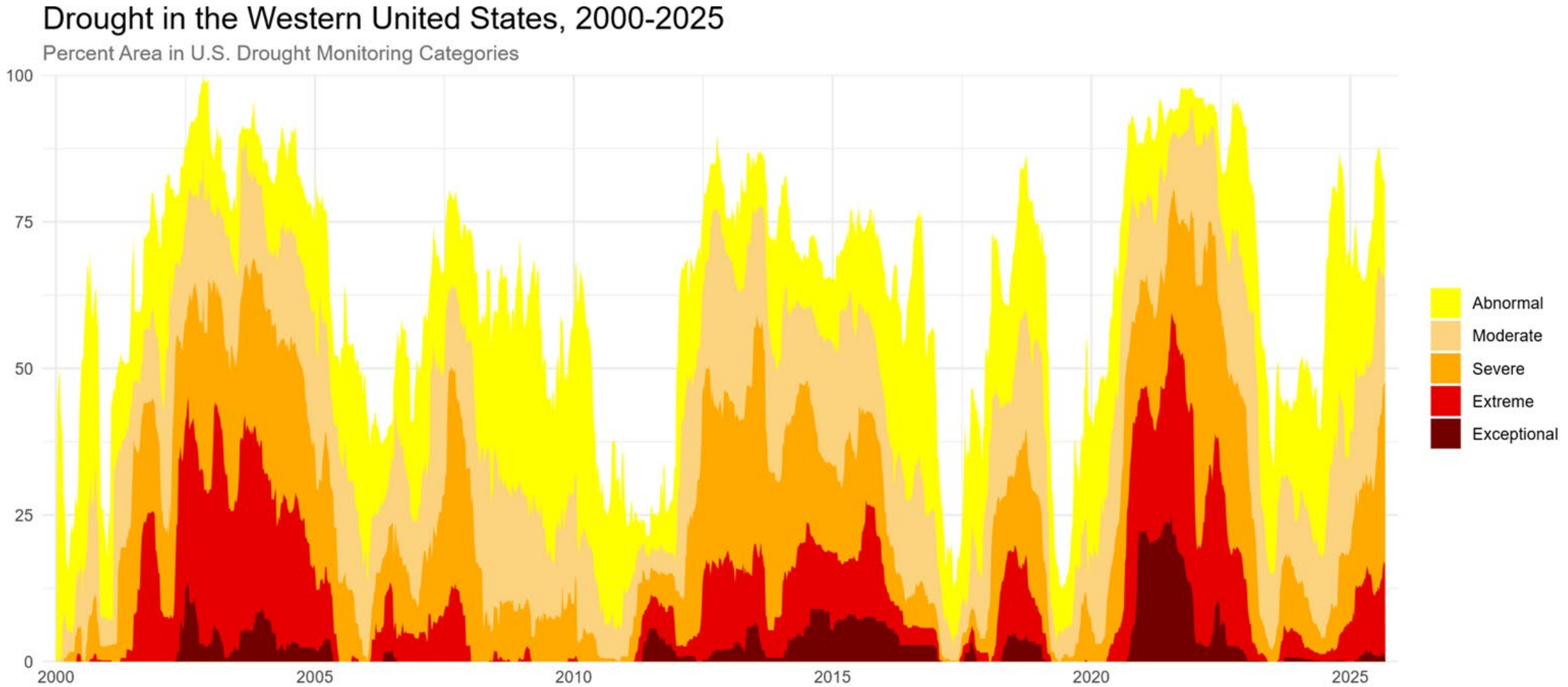
Problem & Stakes

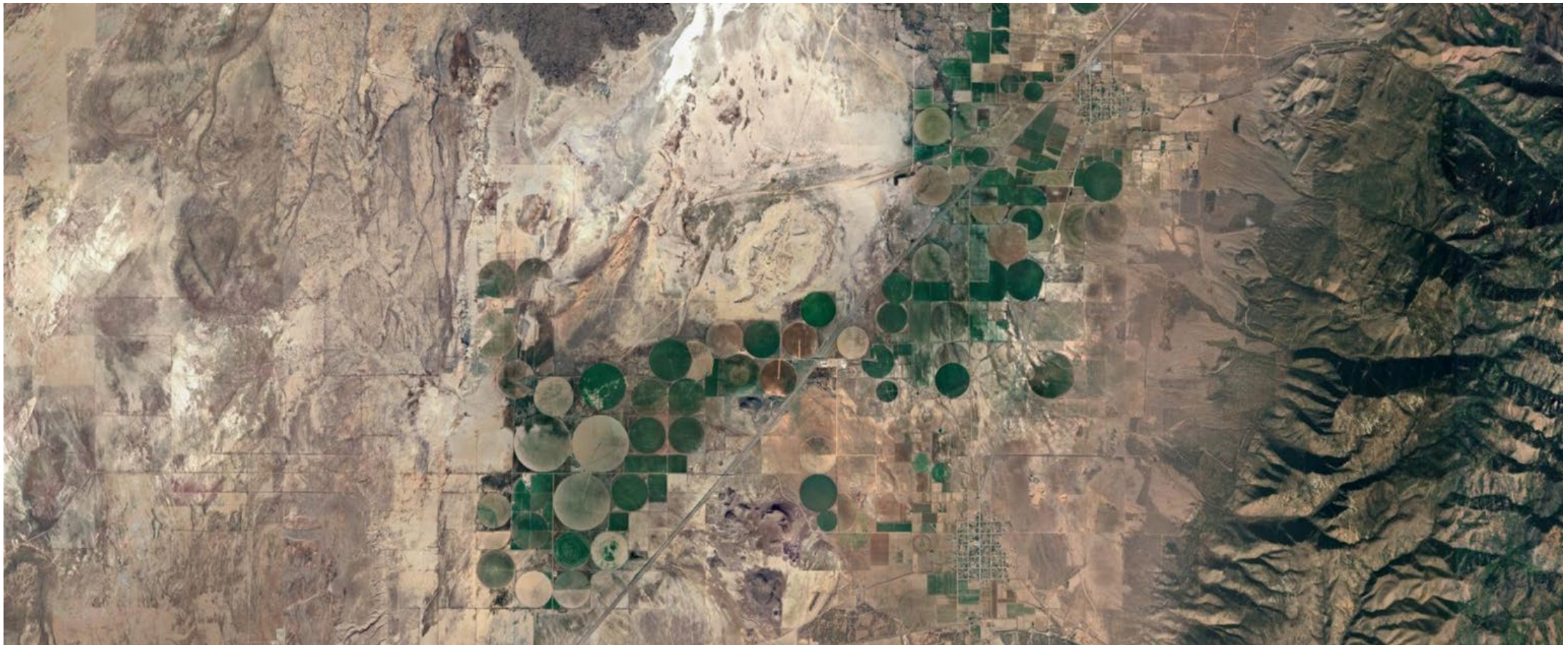
Goal: use **Responsible AI** to **estimate soil moisture** and **support efficient irrigation** in agriculture.



Source: NOAA National Integrated Drought Information System

Data & Context

Sources: Federally funded monitoring stations and **orbiting satellites.**

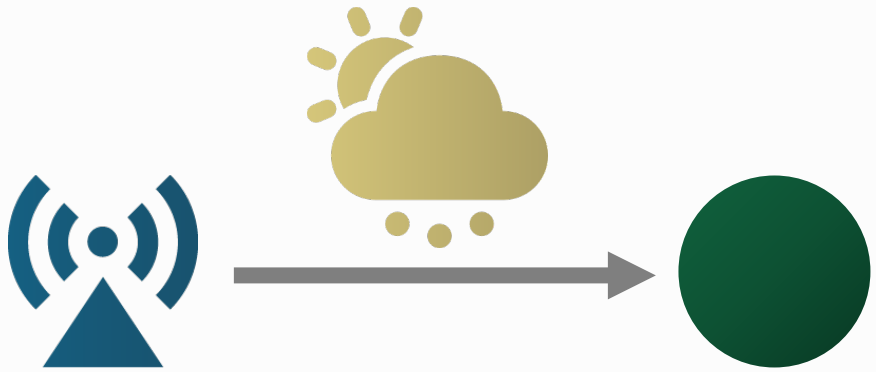


Farm land near Meadow, UT, from Google Earth.

Method & Guardrails

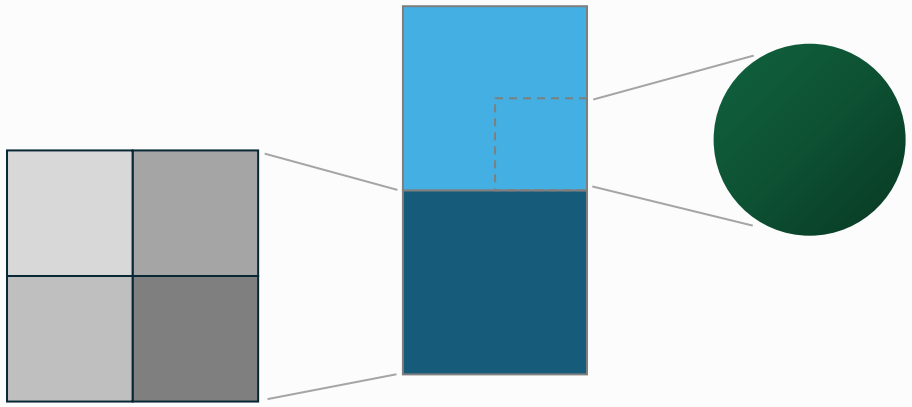
Model 1: Universal Deep Kriging

Estimate soil moisture at a **farm plot** as a function of **weather** and **distance** from **soil monitoring stations**.



Model 2: Image Translation

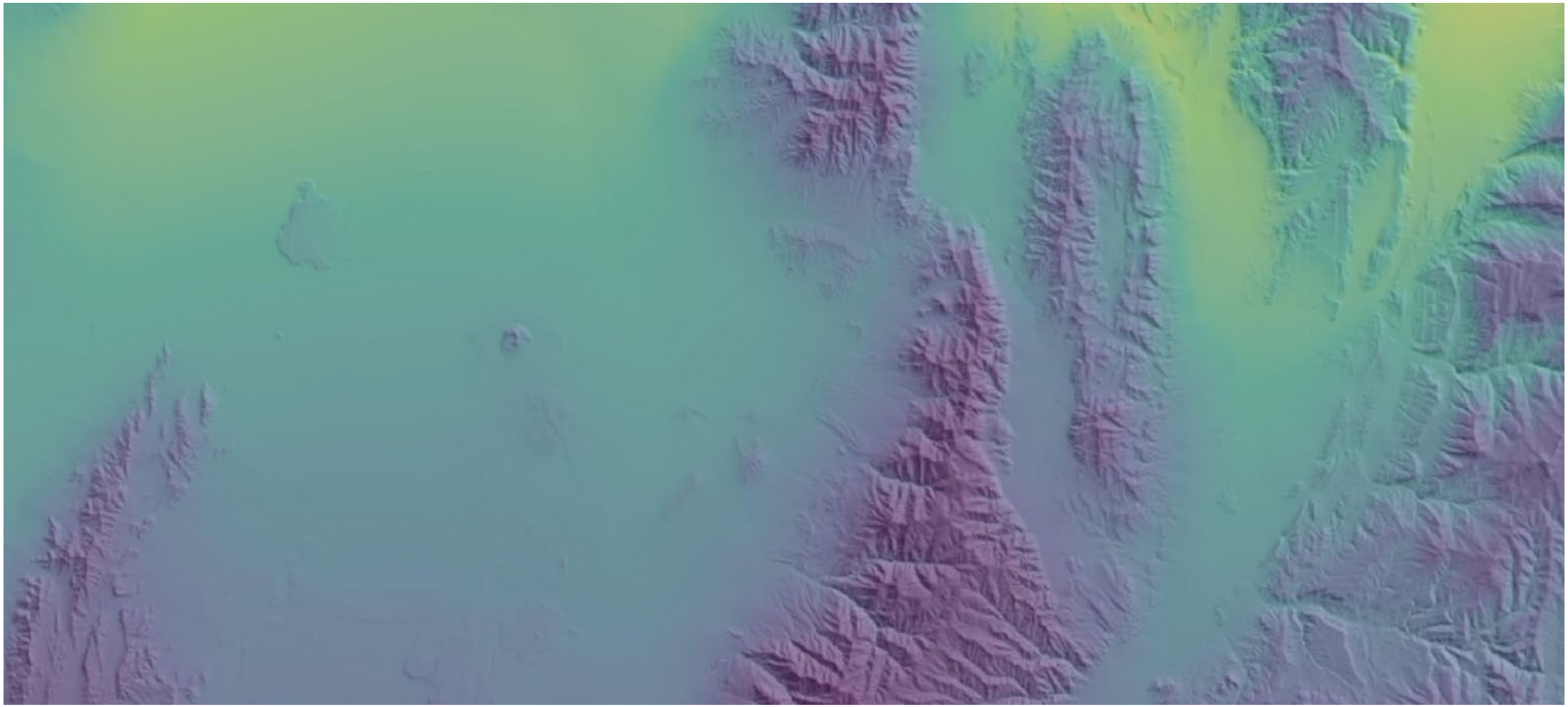
Down-scale **soil moisture forecasts** to a resolution relevant to irrigating a **farm plot** using **terrain imagery** as a guide.



Findings & Case Study

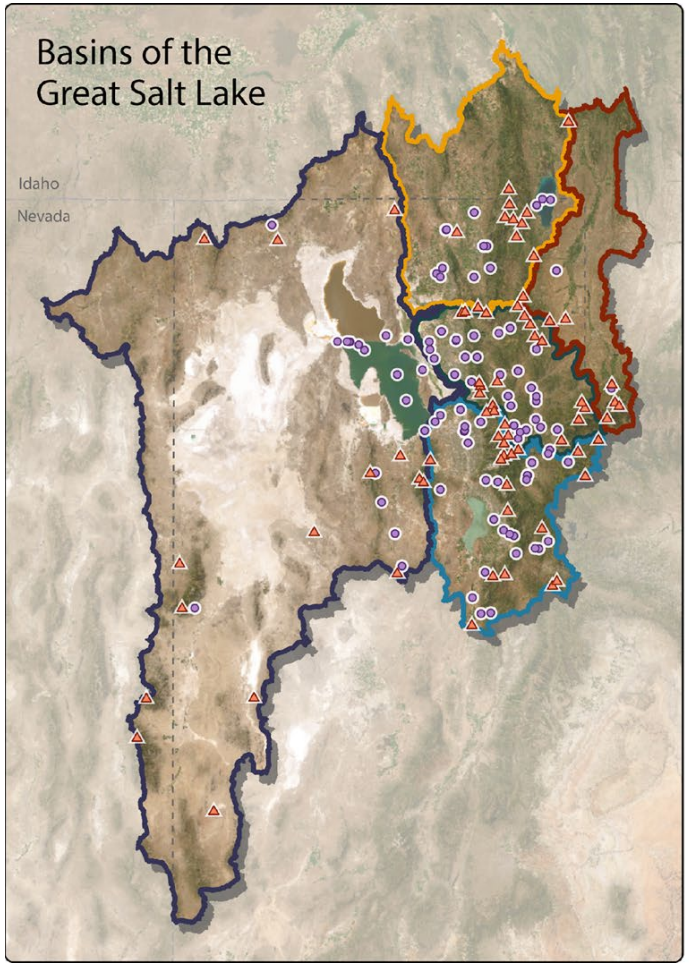
Model 1: Universal Deep Kriging.

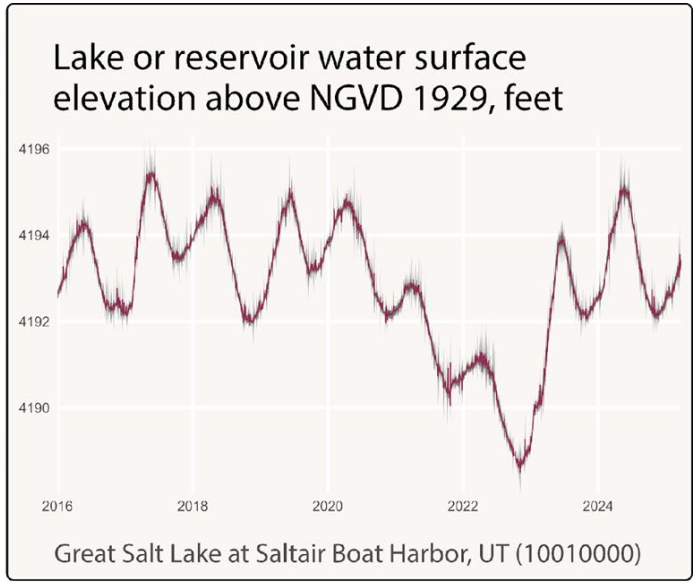
Soil Moisture: Low High



Path to Impact

NSF Proposal: CAIG: An AI-based framework for soil-moisture modeling and decision making





- USDA AWDB Monitoring Stations
- USGS NWIS Lake and Stream Gauges
- Great Salt Lake
- Jordan
- Lower Bear
- Upper Bear
- Weber

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Source: Figure made for NSF proposal.