



transforming the way the world works



# Transformative GIS: Place-Based Technology for a Smarter Planet

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# Agenda

## Transformative GIS



1 Challenges ... Trends ... Opportunities ...

2 Data enables Visualizing and Modeling

3 Data enables ... Operational Efficiency

4 Examples

5 Discussion



*Collaborative Approach Fostering Global Peace and Prosperity*

**CHALLENGES...TRENDS.. OPPORTUNITIES...**



# Change and Challenges

## New Challenges for Policy Makers



*Global and Local Challenge*



# Sprawl

The diseases of the 21<sup>st</sup> Century will be chronic diseases ...and consume time and money.

These diseases -

- Heart disease
- Diabetes
- Obesity
- Asthma
- Depression

are diseases that can be moderated in how we **design and build** our environment.

*Richard J. Jackson, MD, M*  
*Director, CDC's National Center for Environmental Health*



We Need:



Greater Knowledge & Awareness

Sustainable Development

Comprehensive Planning

Equitable Resources Management

Collaborative Action – Conflict Resolution





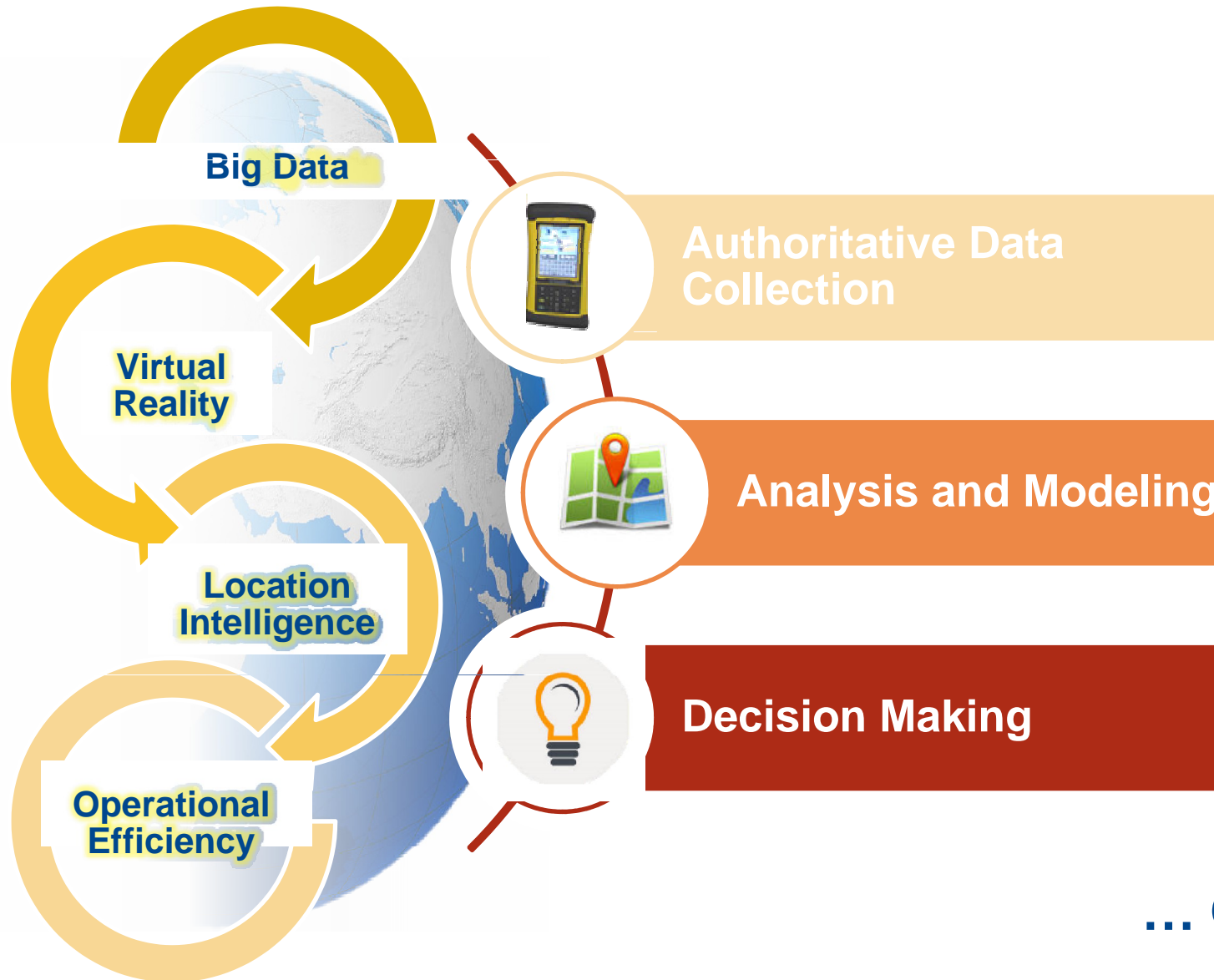
# Big Data .... Big Questions



***Spatial Questions Demand Spatial Answers***



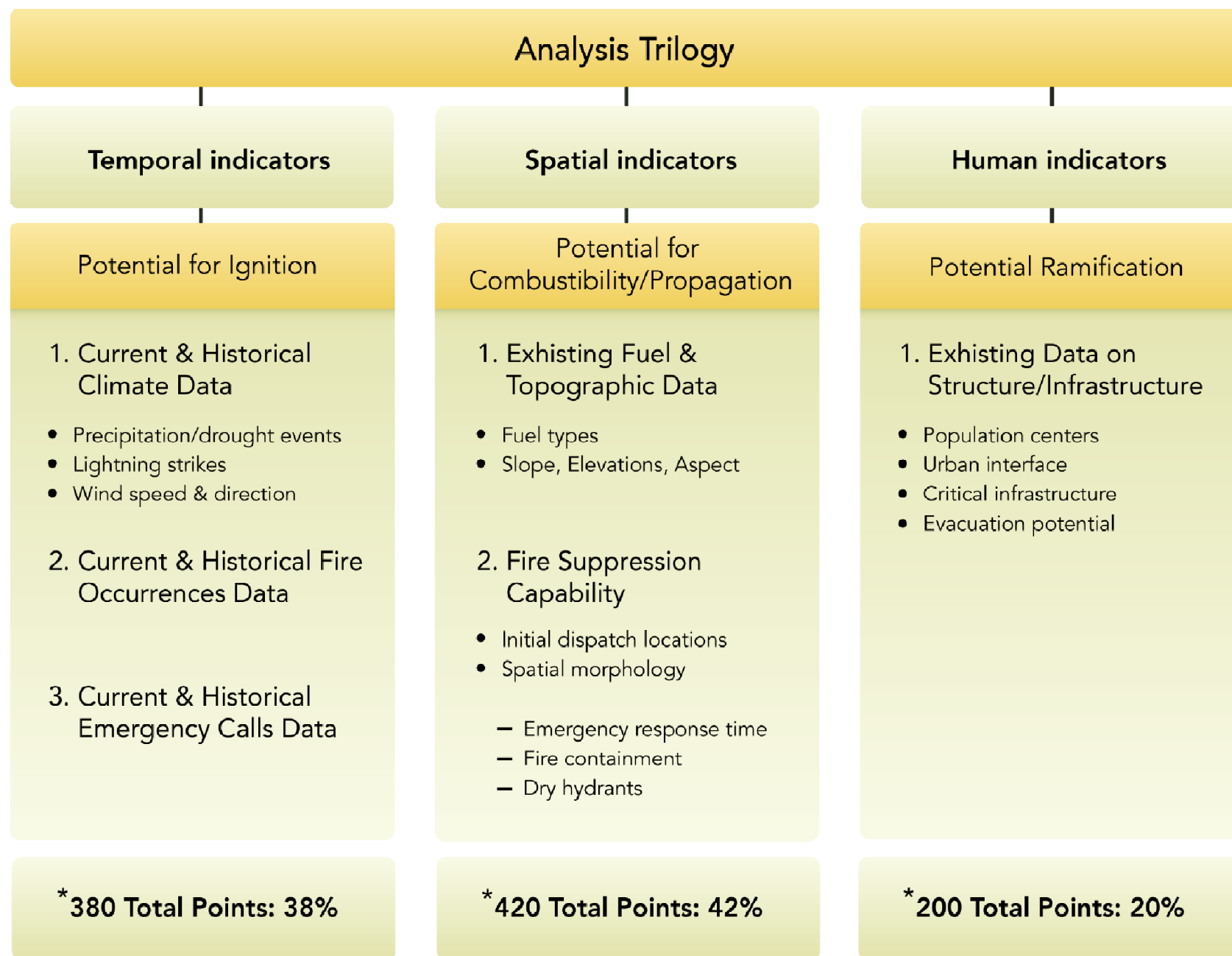
# Trends Driving Our Vision:



- Data volumes
- Data frequency
- Data velocity
- Data sources and formats
- Reliability
- Authoritativeness
- RELEVANCE

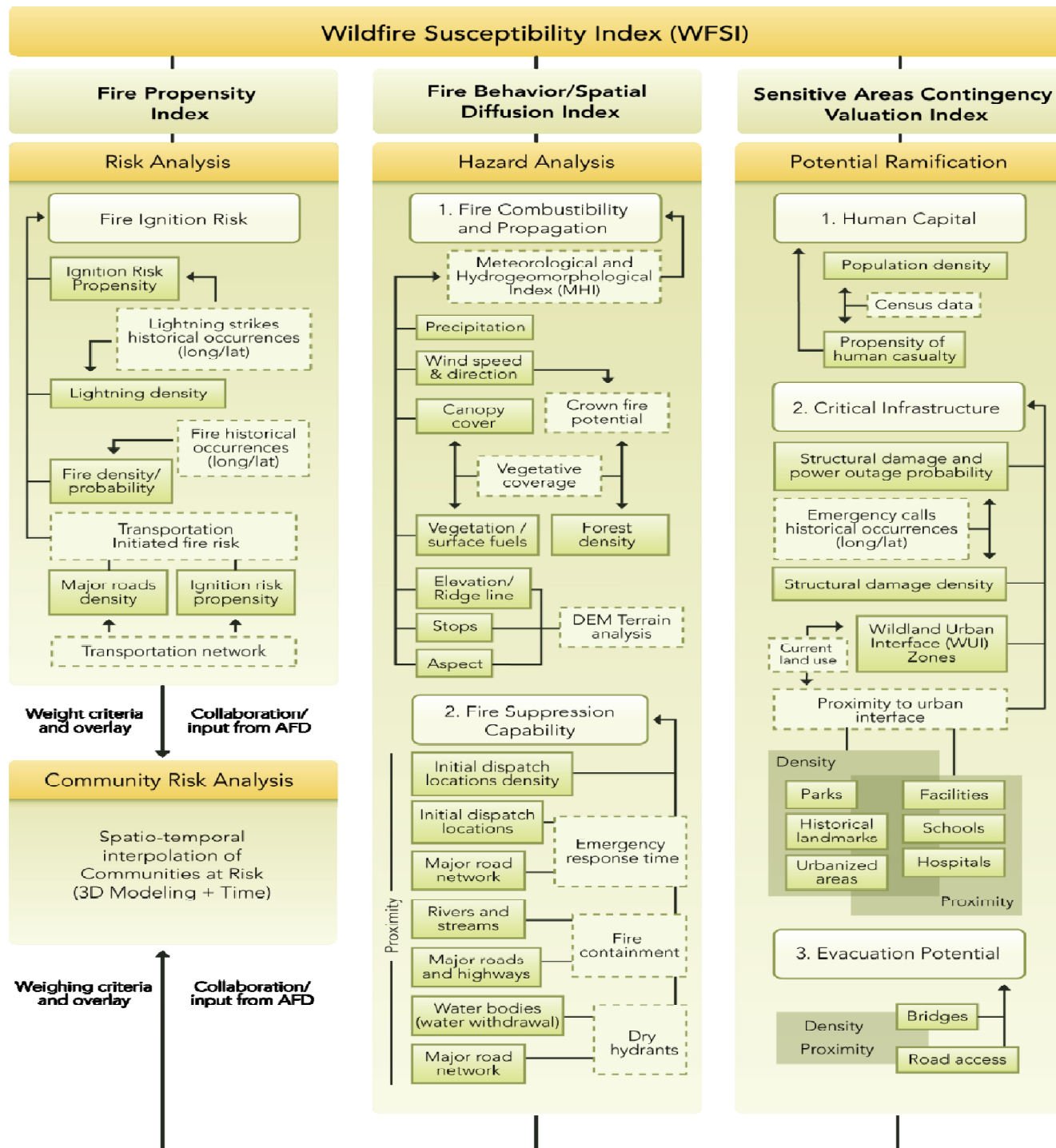
... Operational efficiency

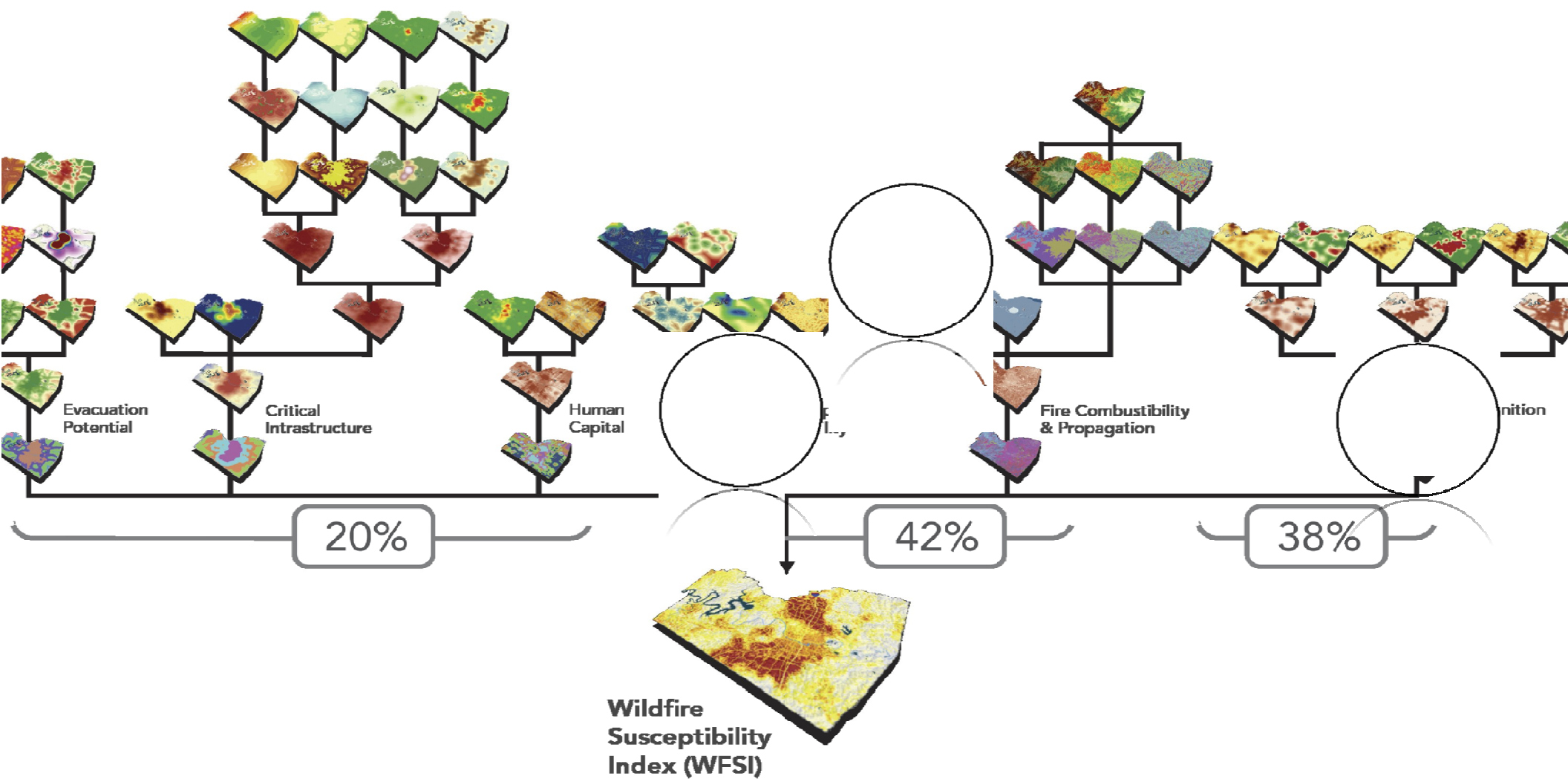
**DATA ENABLES ANALYSIS AND DECISION MAKING**

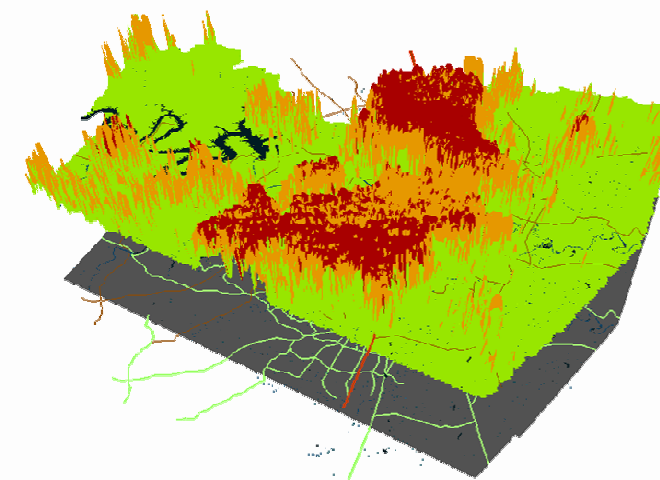
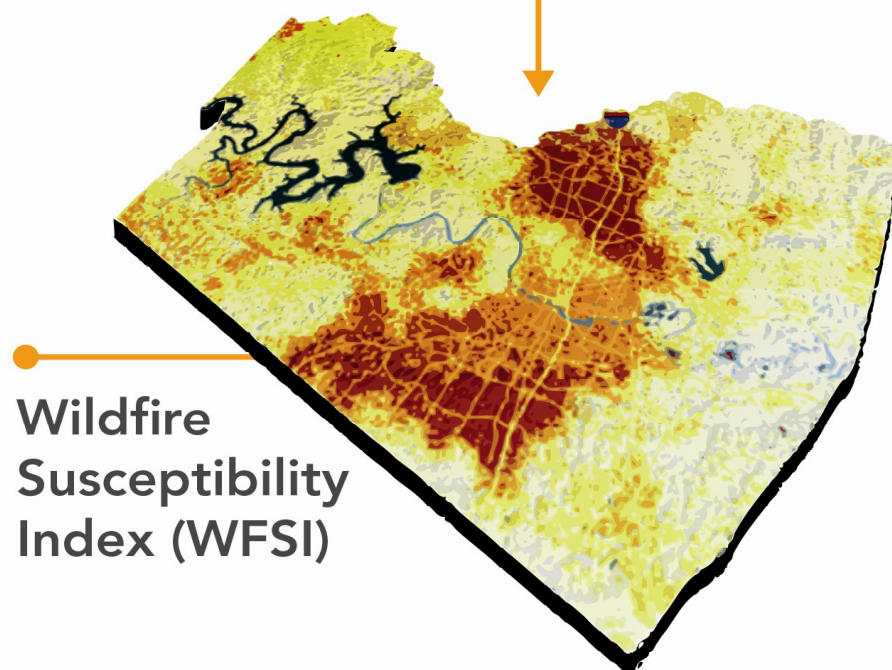
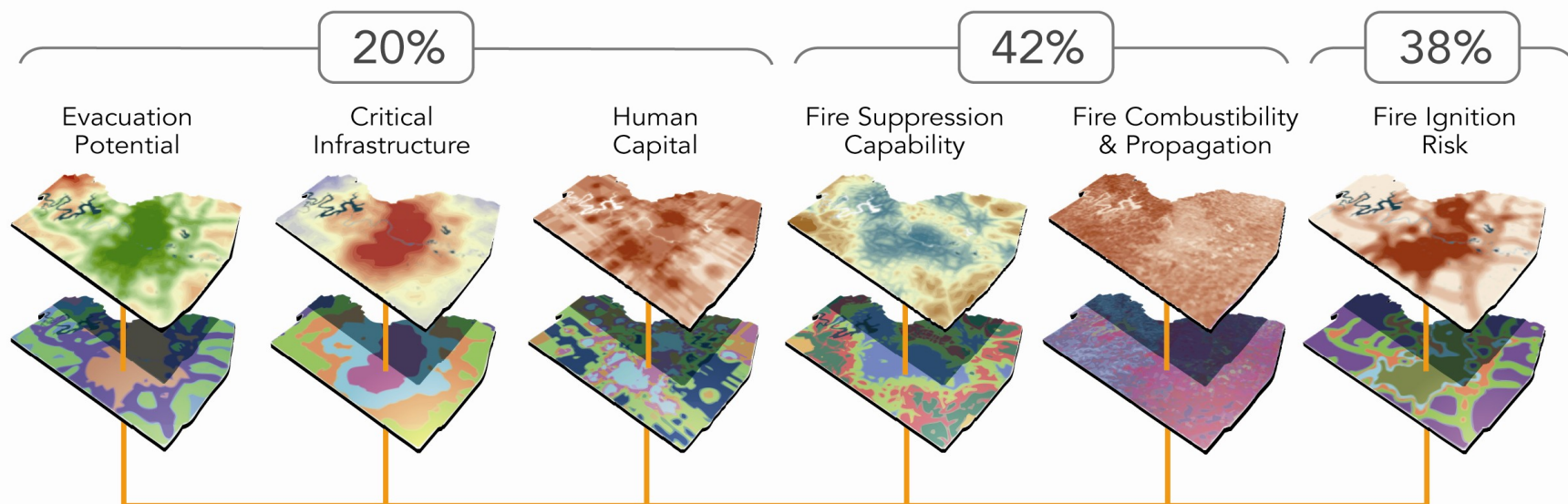


\*These are identified in collaboration with local community and AFD









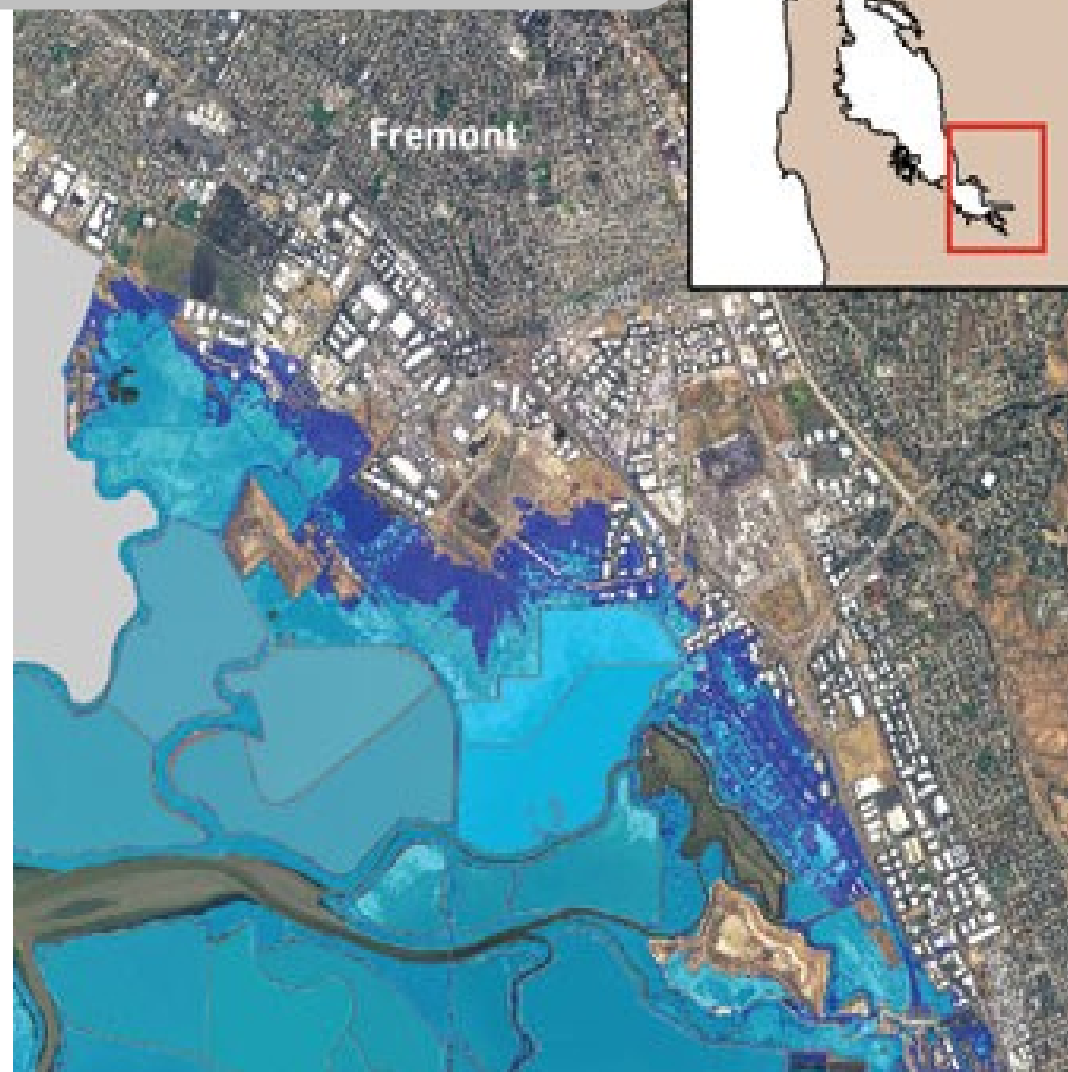
- Risk
- Probability
- Magnitude of impact

Disaster Mitigation and Land Use Planning



# eCognition Image Analysis

Sea Level Rise Analysis for Climate Change and Land Use



**DATA ENABLES...OPERATIONAL EFFICIENCY**

# Transforming ..



**Agriculture**

**10%** input reduction using precision maps  
**30%** reduction in water usage for irrigation



**Heavy Civil  
Construction**

**30%** improvement in project improvements  
**55%** reduction in surveying and engineering time

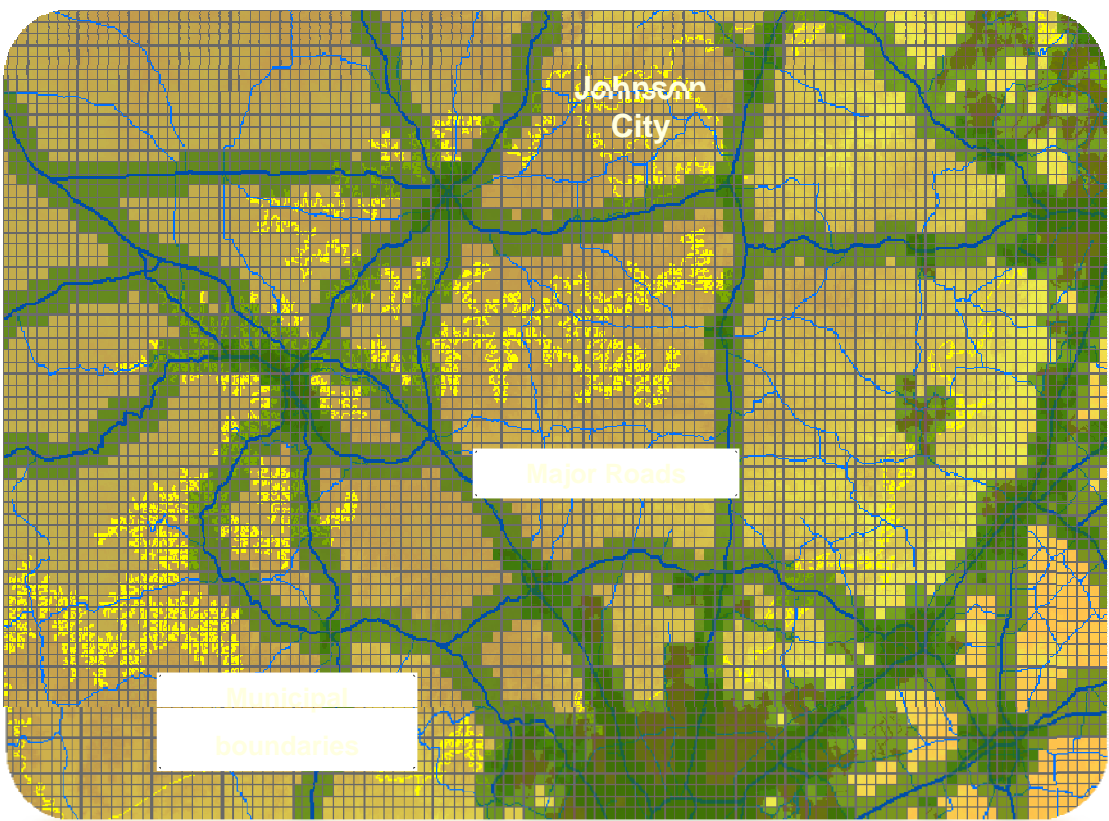


**Transportation &  
Logistics**

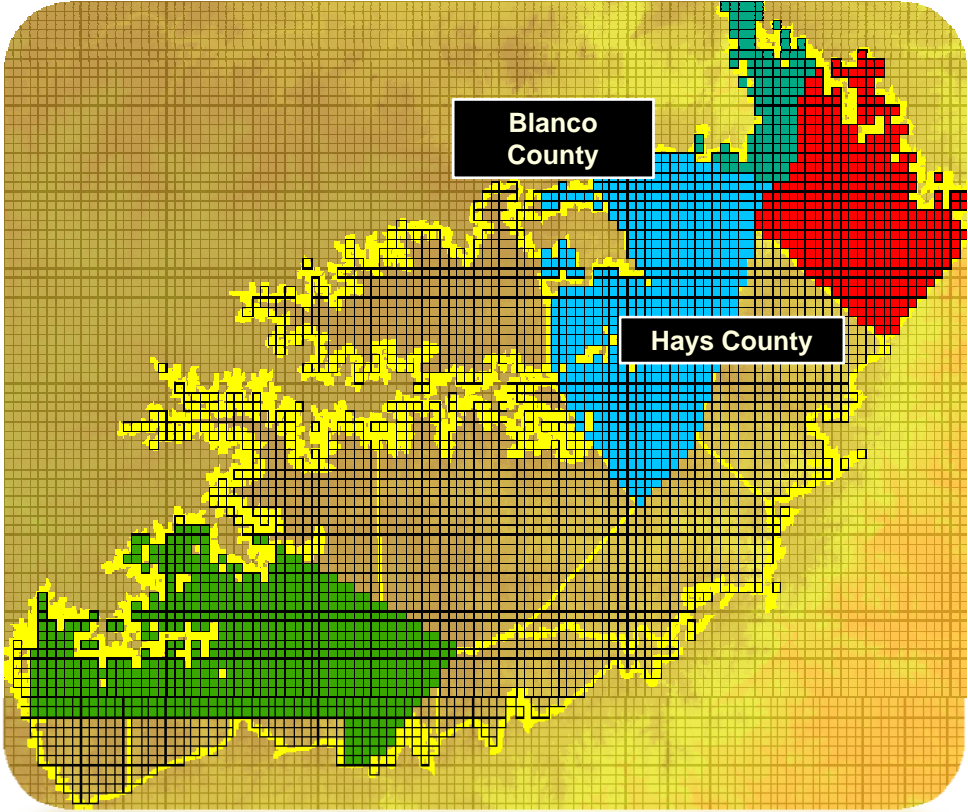
**31%** reduction in daily mileage  
**32%** improvement in fleet utilization



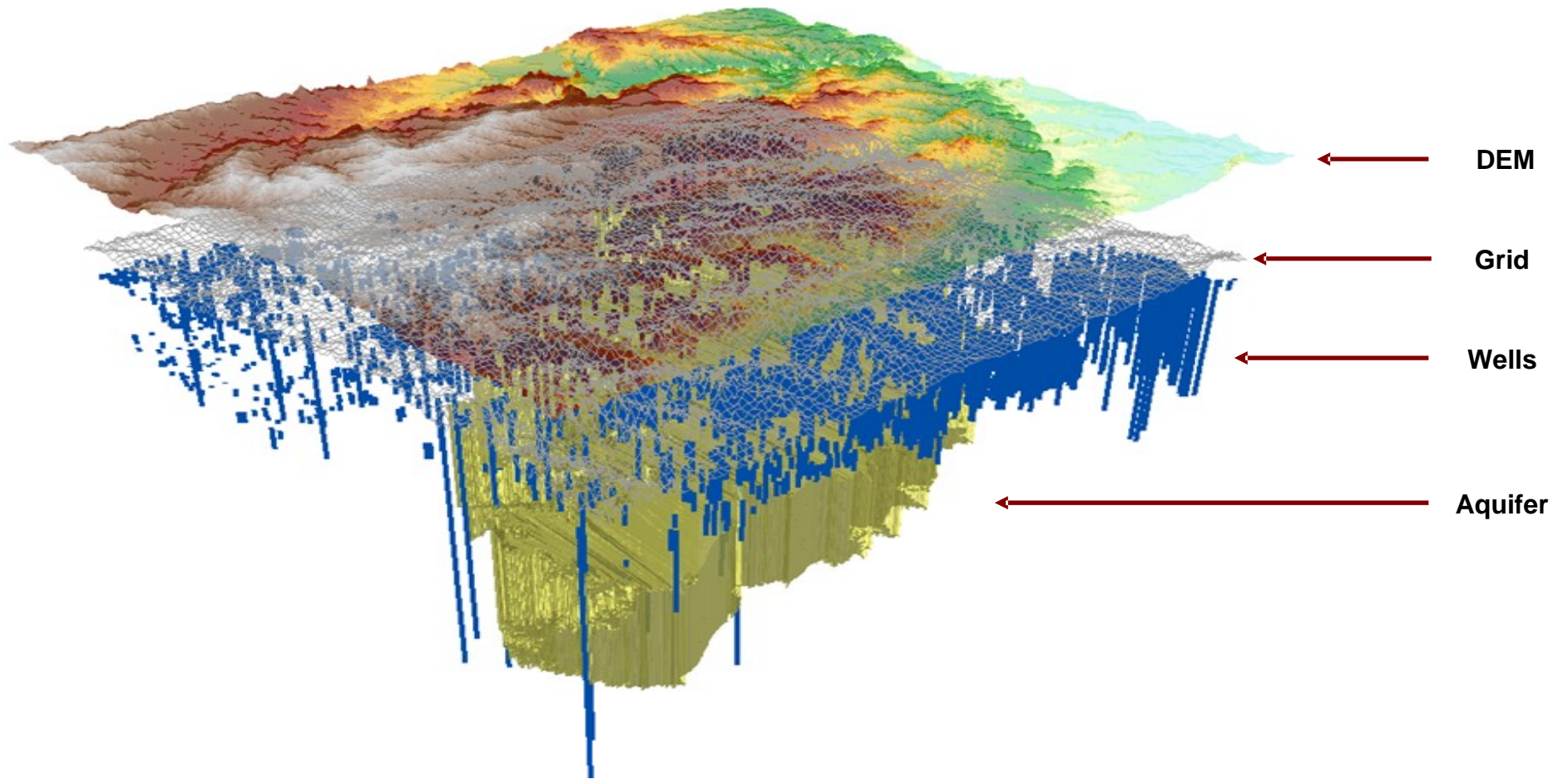
**Expected Growth Corrid  
(Municipal Boundaries)**



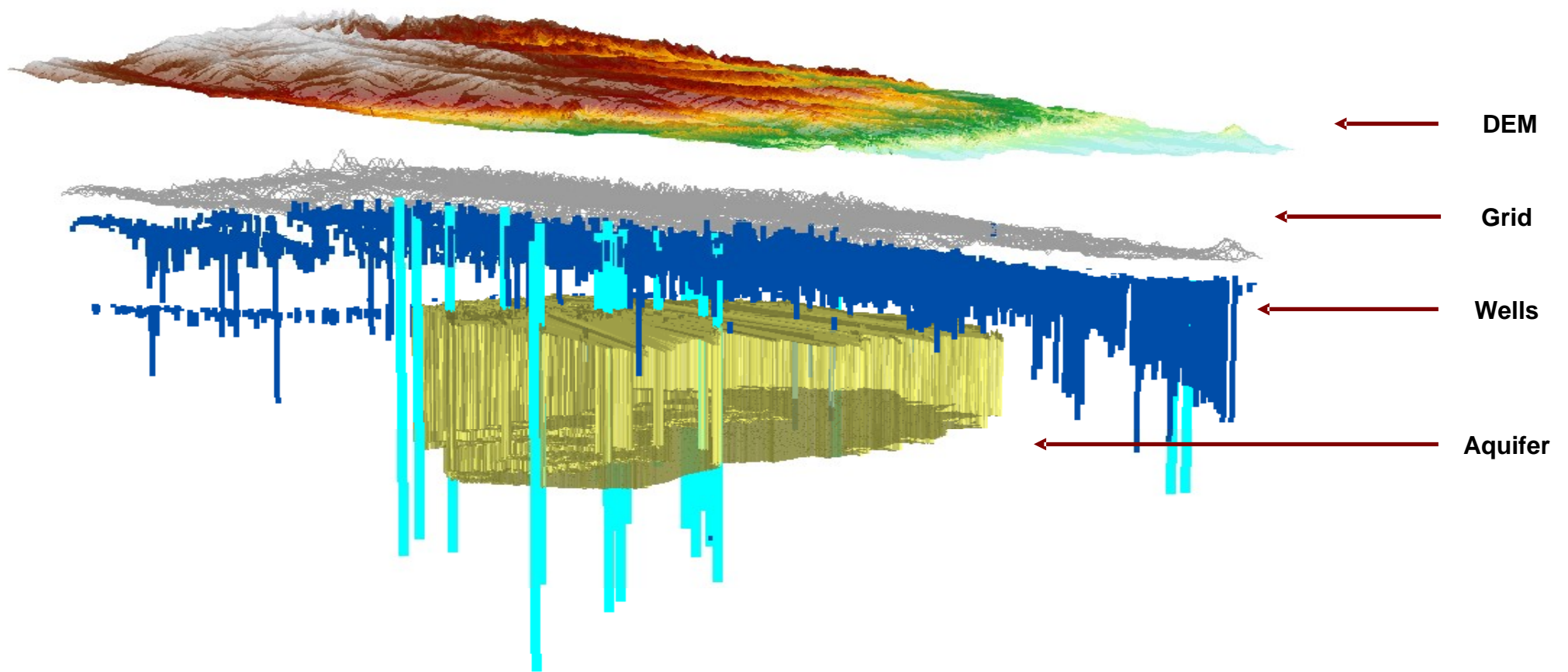
**Zones Based on County Lines**



# System Architecture Design & Components

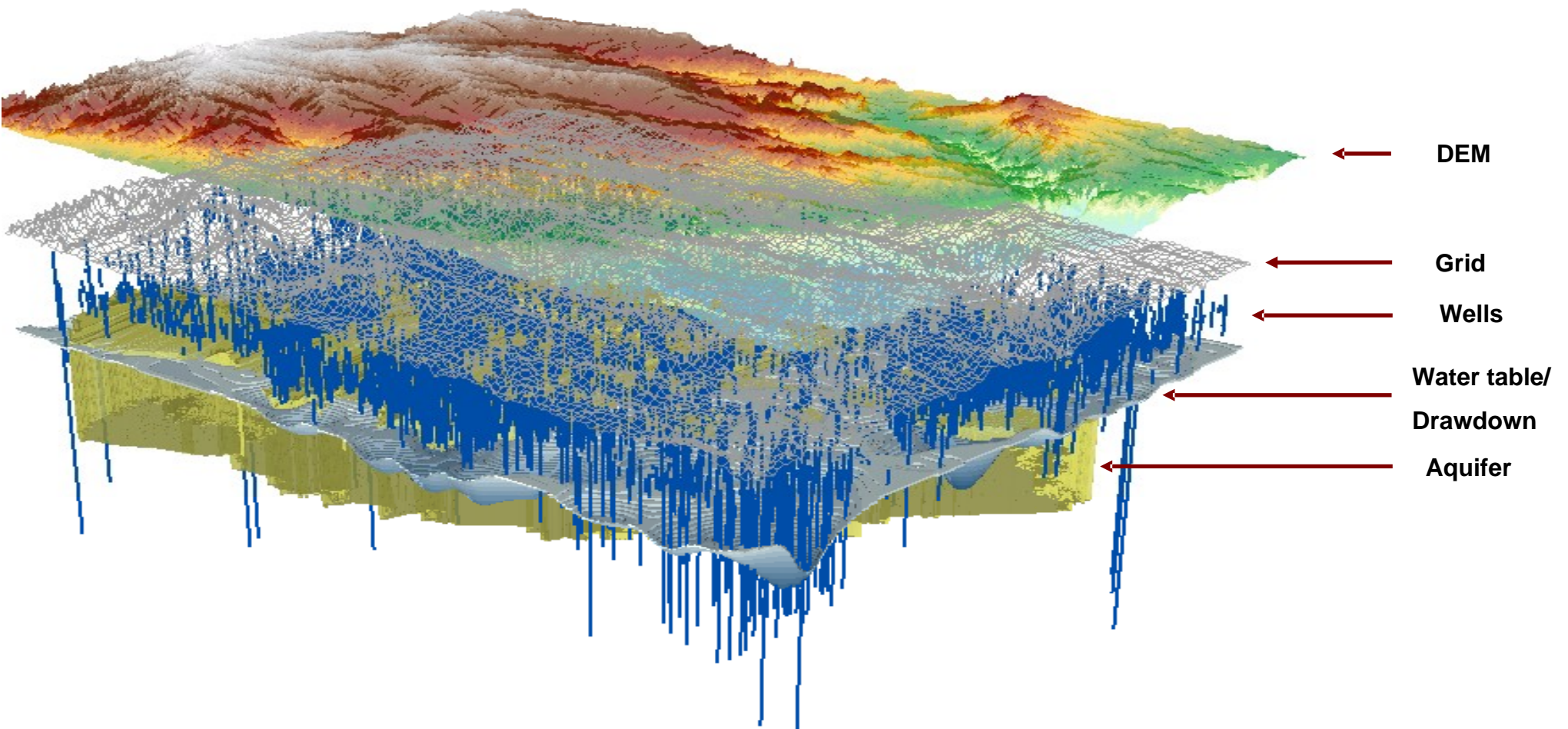


# System Architecture Design & Components



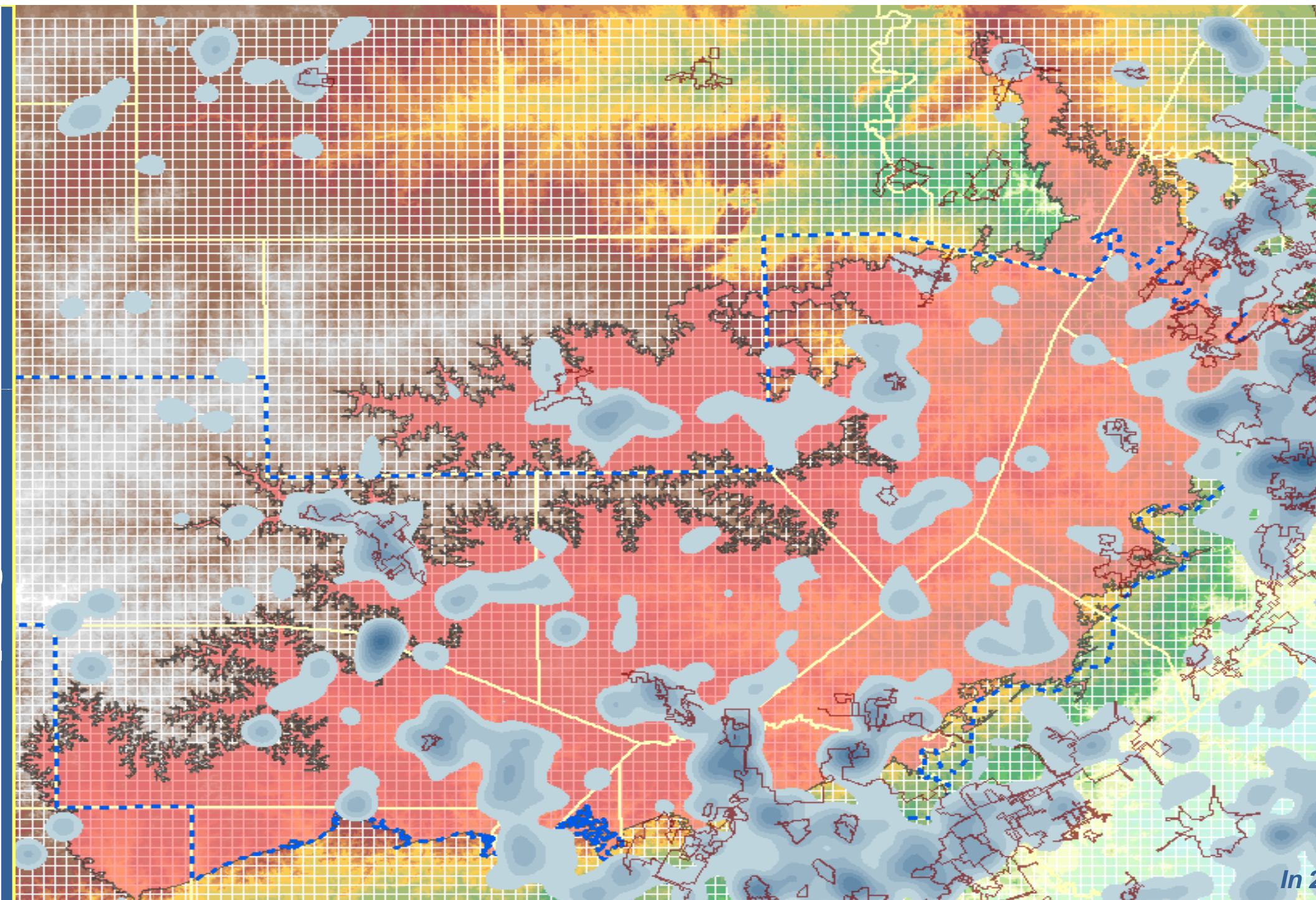


# System Architecture Design & Components

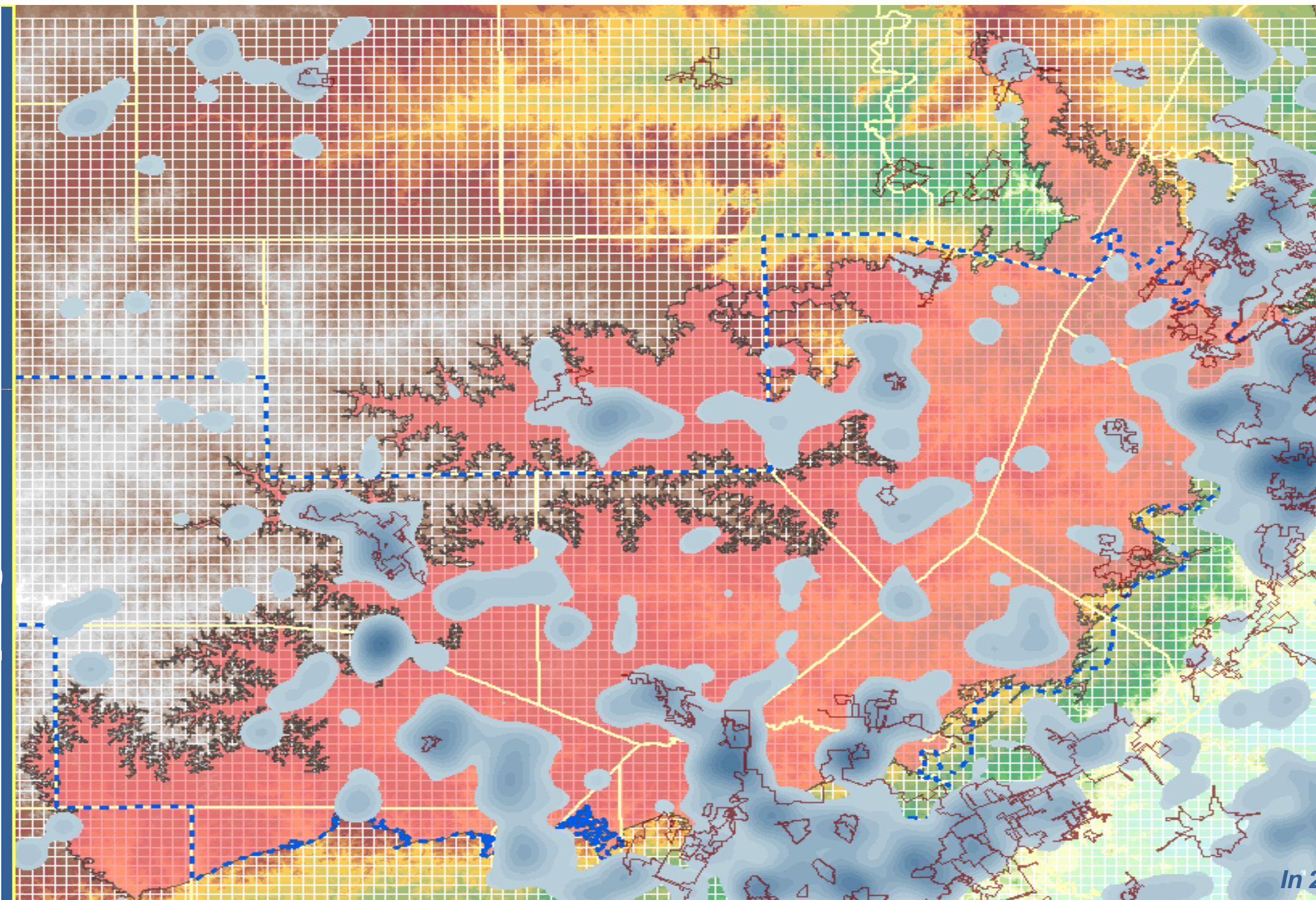


Initial water level elevations vary from 2000-500 in feet above mean sea level

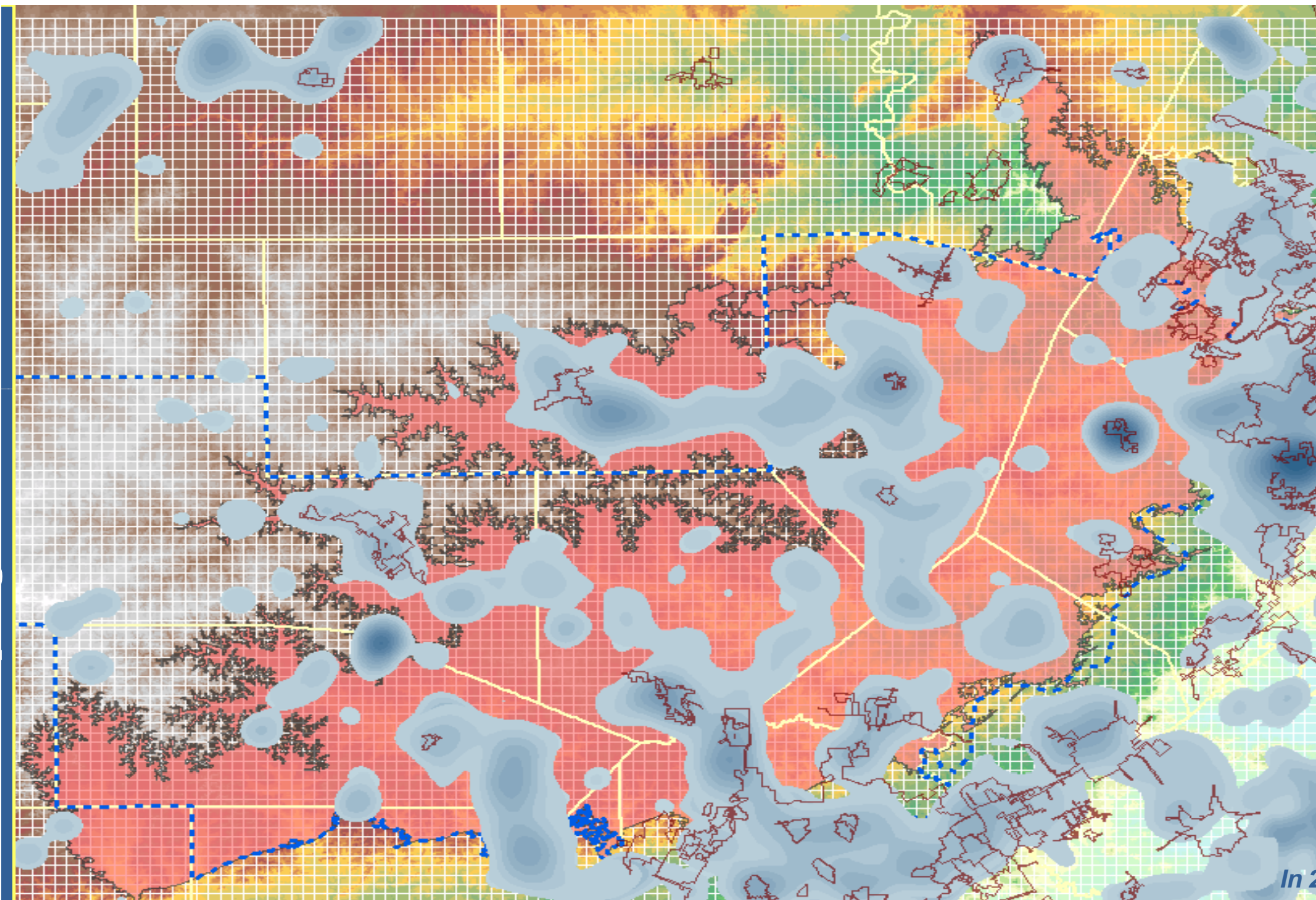




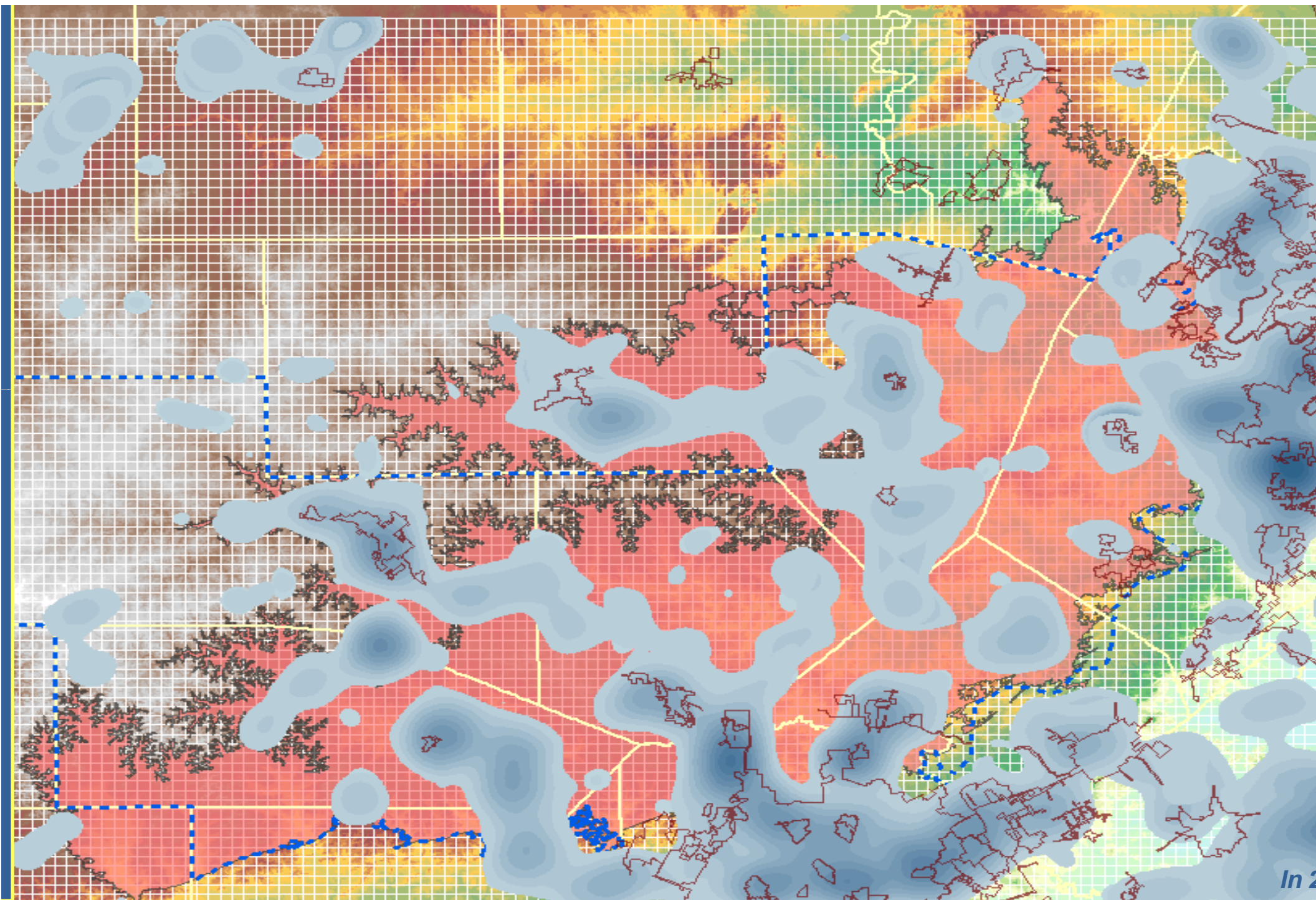




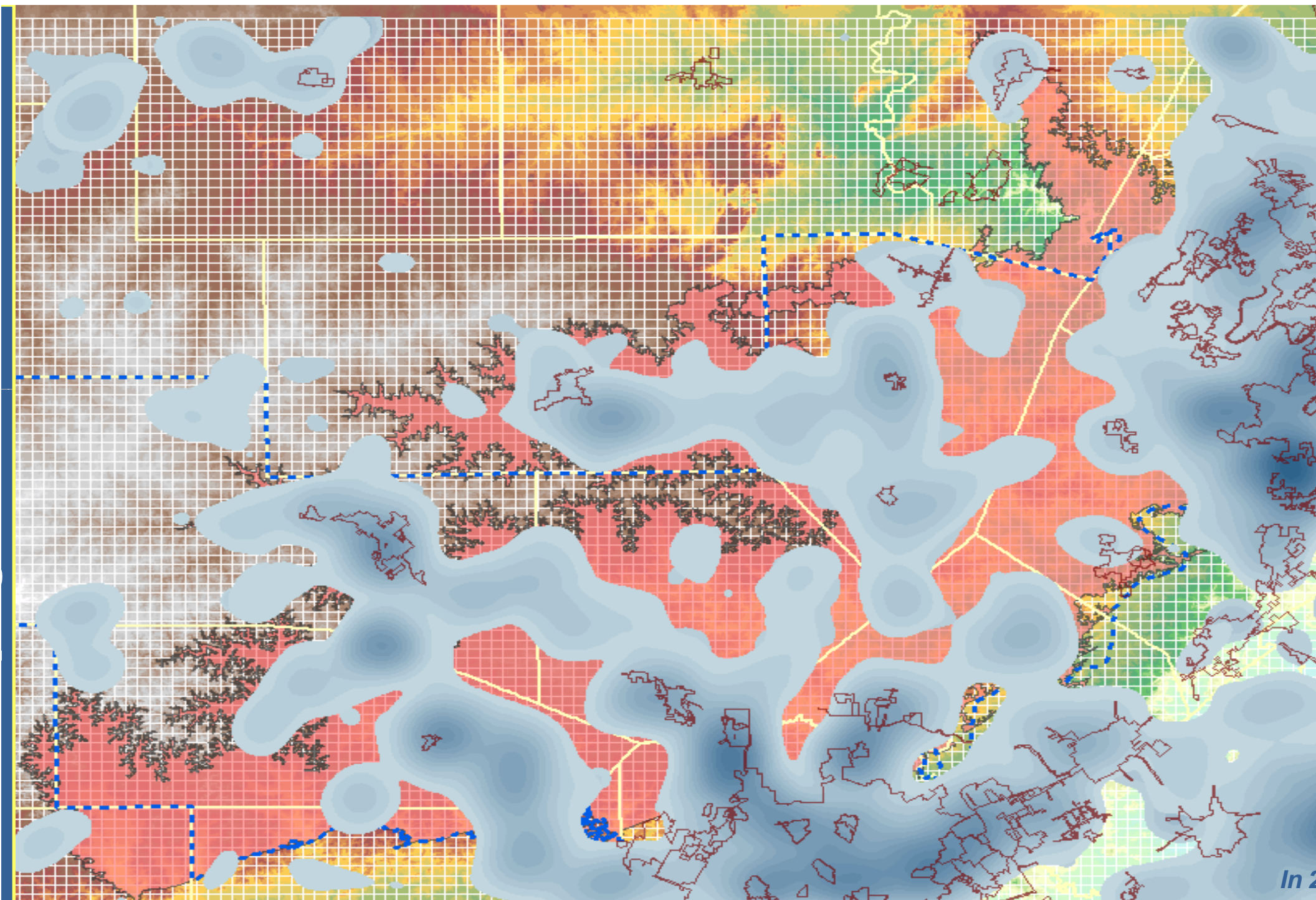










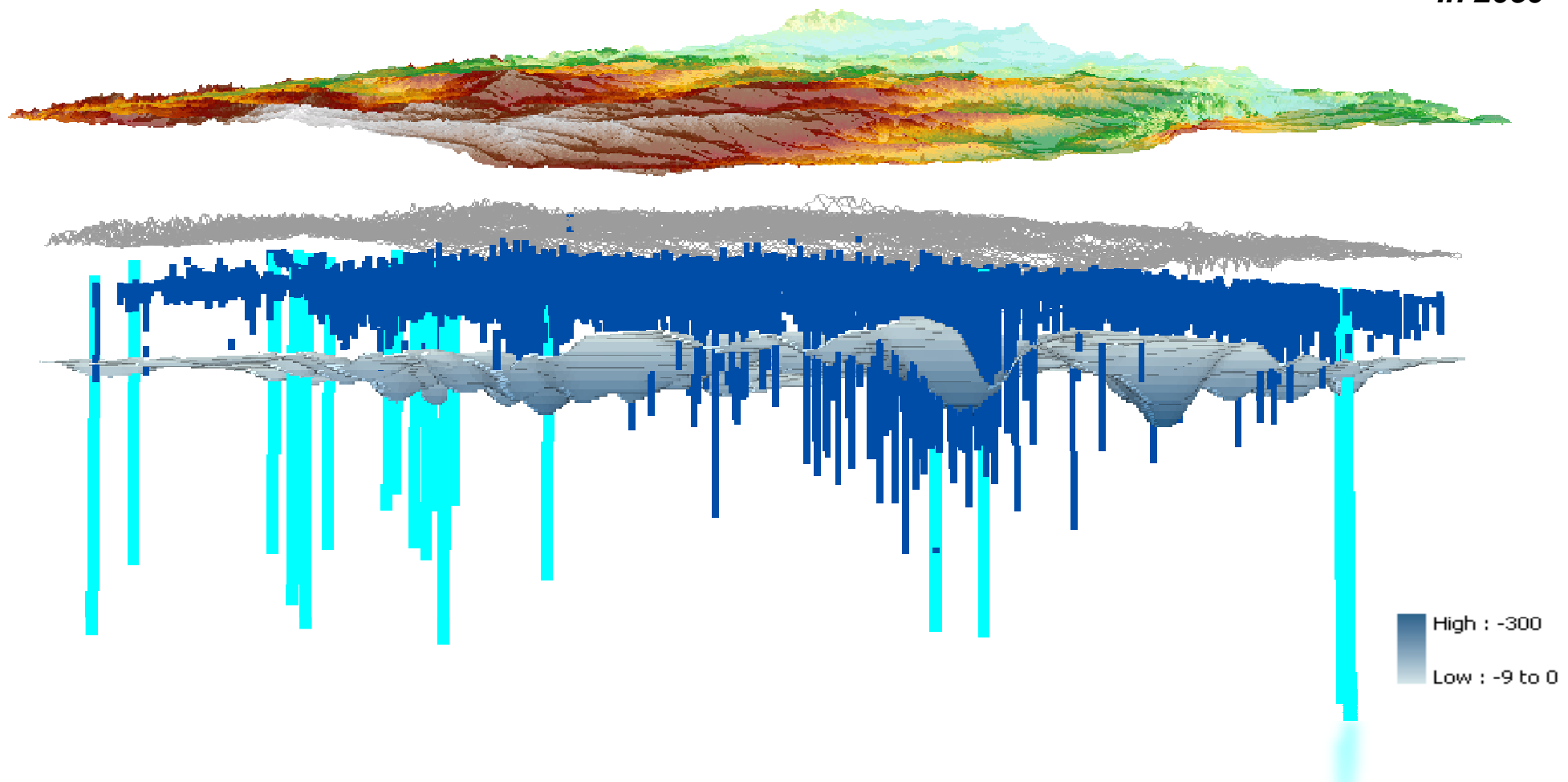




# Changes in water level elevations: Water level decrease (drawdown)

Middle Trinity Aquifer:

*In 2050*



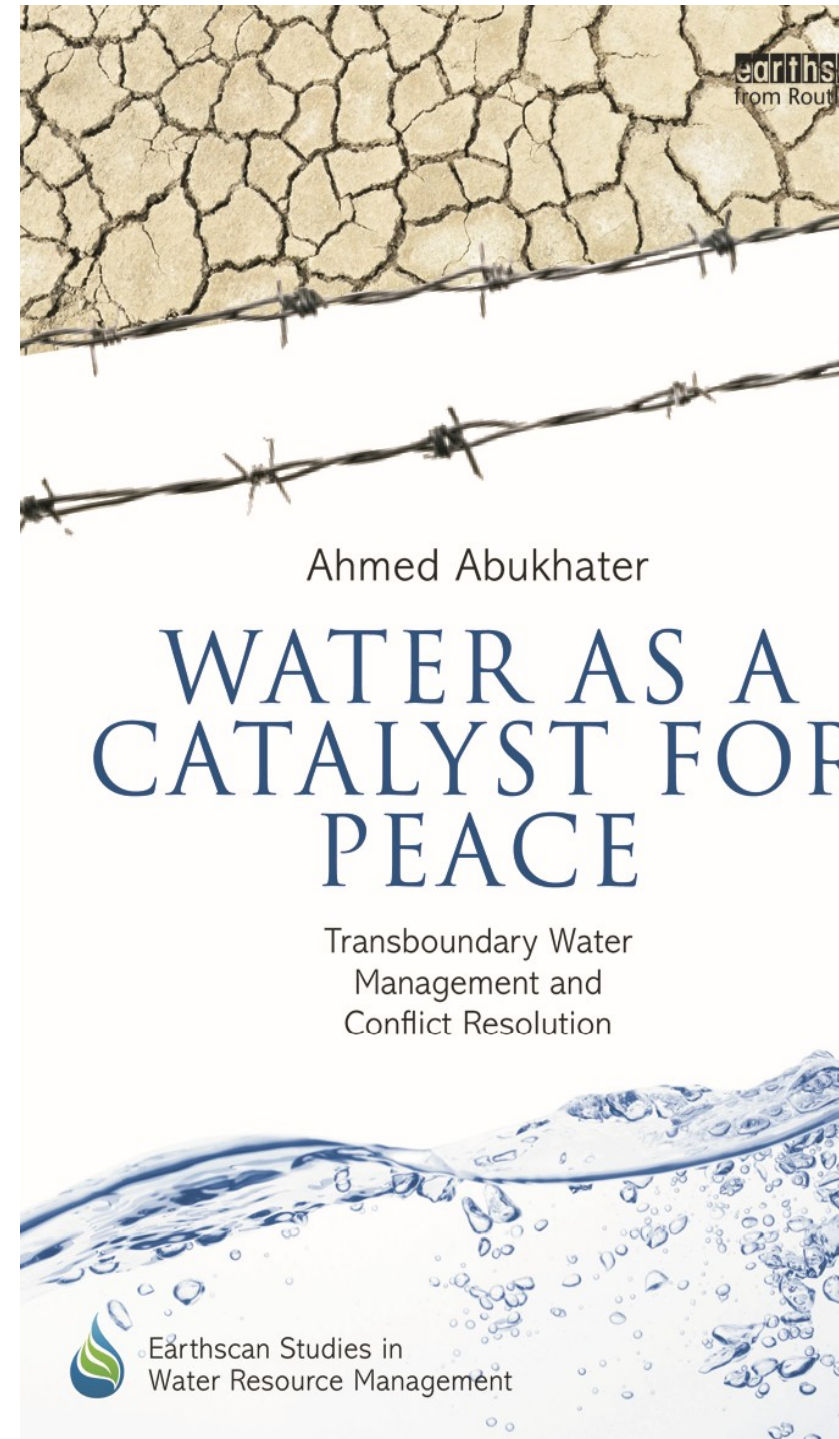
# Water Wars?



*“Whiskey is for Drinking,  
Water is for Fighting!”*

Water is **not** the source of conflict but it is  
rather an **obstacle to peace**.

**A remarkable seed of hope:**  
Water, after all, is used to extinguish  
fires, not to ignite them.



Thank you...



Questions?

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