



**Socially Sustainable Solutions for Water, Carbon, and Infrastructure Resilience in Oklahoma**  
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**Oklahoma NSF EPSCoR  
2022 S3OK Annual State  
Conference**

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# *OKLAHOMA NSF EPSCoR RESEARCH OVERVIEW*

## **Project Overview: Project Motivations and Goals**

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# *S<sup>3</sup>OK: MOTIVATION AND GOALS*

## **THE GRAND RESEARCH CHALLENGE**

Finding **broadly acceptable and sustainable solutions** to the intersecting problems posed by:

- **Changing S2S weather patterns**
- **Terrestrial water and carbon dynamics**
- **Changing water quality/quantity; shifting landscape use**
- **Enhanced threats to infrastructure**

# S<sup>3</sup>OK: MOTIVATION AND GOALS

## WHAT MAKES A PROBLEM WICKED?

- We have incomplete knowledge and/or competing understandings of the problem
- The problems are interconnected while stakeholders and institutions that seek to solve the problems are not
- The key stakeholders have varying perceptions, beliefs and interests
- The magnitude of expected economic costs of the problem and of potential solutions is large and unequally distributed

# *S<sup>3</sup>OK: MOTIVATION AND GOALS*

## **SUSTAINABLE SOLUTIONS TO WICKED PROBLEMS (SSWPS)**

- **SSWPs are characterized by approaches that:**
  - Are respectful of diverse beliefs and social narratives;
  - Accept incomplete, incremental improvements;
  - Address equity implications and tradeoffs; and
  - Recognize that, although complete solution of the problem remains beyond our current grasp, aspects of the problem can be addressed.

Our working hypothesis is that SSWPs will be found at the intersections of related but distinct problem areas, where diverse stakeholders can find agreement because the array of issues involved cuts across the usual narratives that frame social conflict.

# S<sup>3</sup>OK: MOTIVATION AND GOALS

## NETWORKED SCIENCE TEAMS

**SD: Social Dynamics** – focus on the societal response to wicked problems, pursuit of socially sustainable solutions

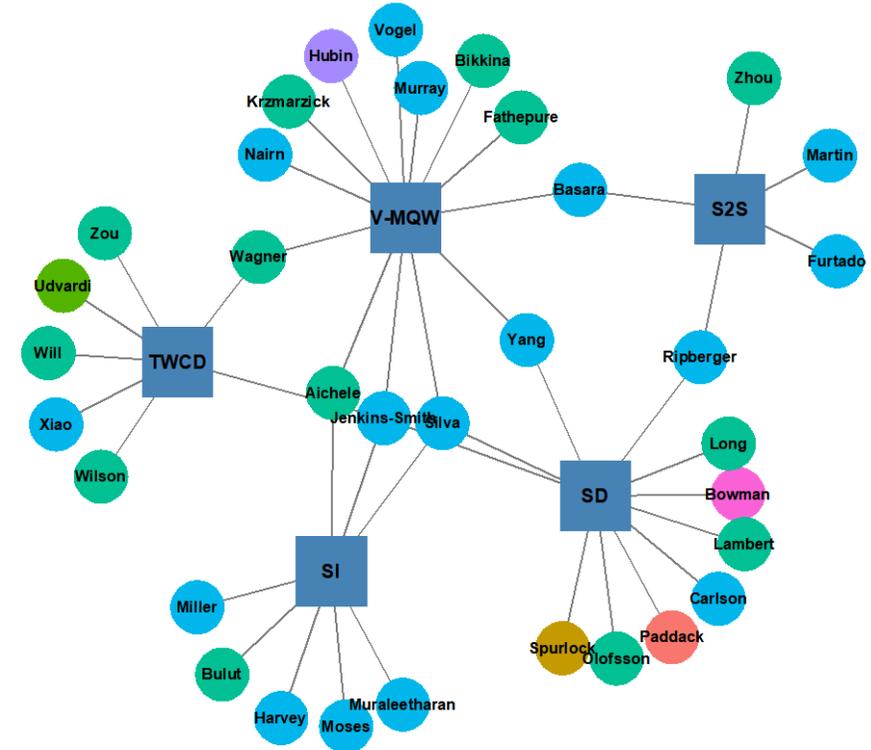
**S2S: Seasonal to Sub-Seasonal Weather Extremes** – study of increasing frequency of extreme WX (for example: drought/flood transitions) in OK

**TWCD: Terrestrial Water-Carbon Dynamics** – interactions of land management, water, soil, and flora

**V-MQW: Variable/Marginal Quality Water** – increasingly variable & marginal quality of water available in OK

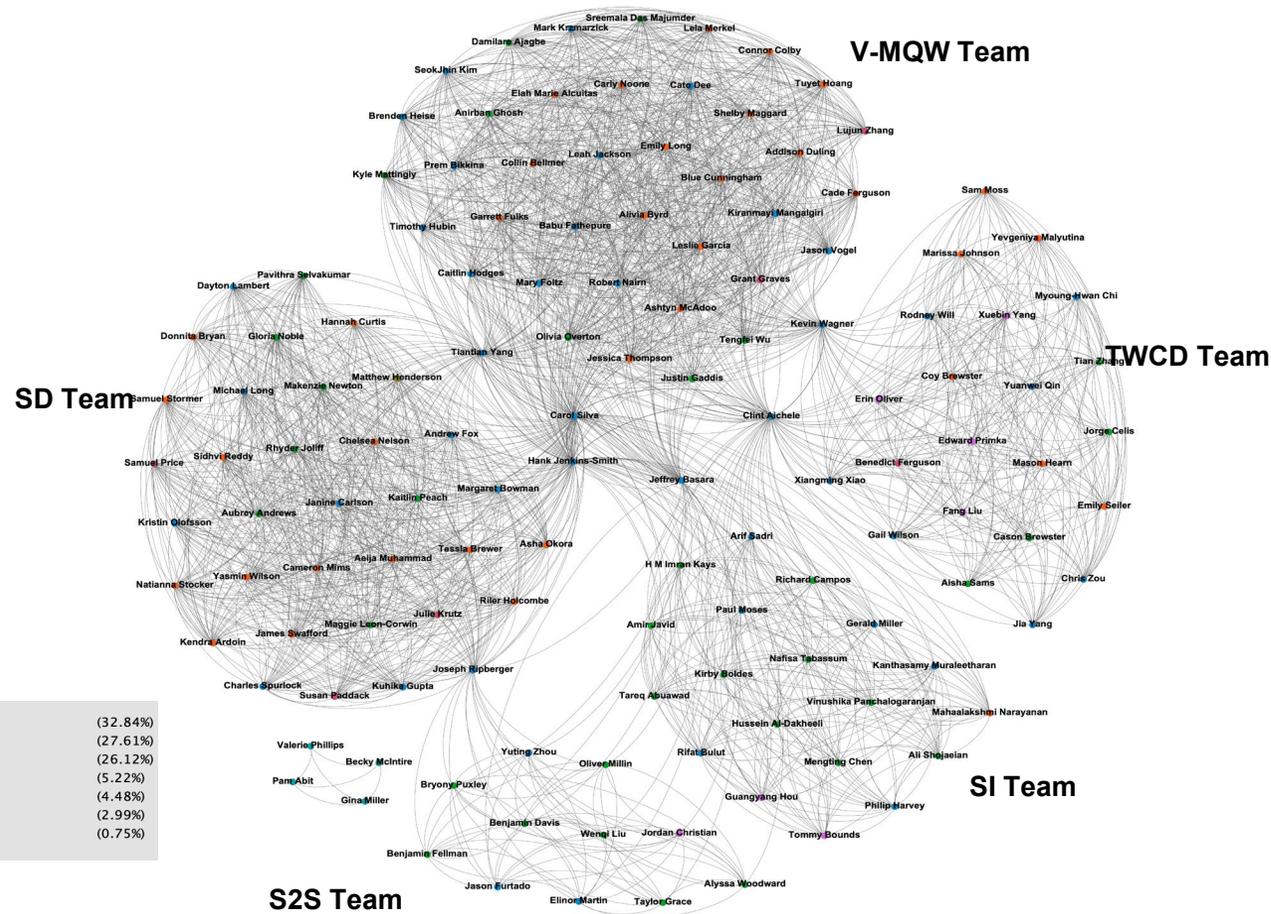
**SI: Sustainable Infrastructure** – effects on water, transport and energy infrastructure and future requirements

Initial S<sup>3</sup>OK Research Network in 2020



# S<sup>3</sup>OK: MOTIVATION AND GOALS

## S<sup>3</sup>OK RESEARCH NETWORK IN 2022

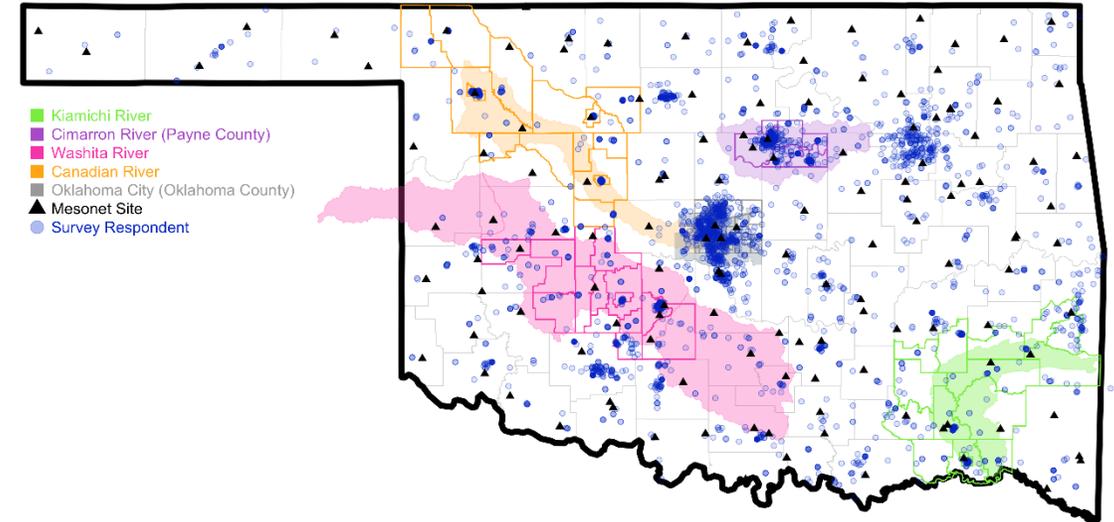


- The S<sup>3</sup>OK team is growing.
- We are beginning to build more robust, formal connections between teams.
- With the ability to meet in person this year, a primary goal will be to strengthen cross-team connections.

# S<sup>3</sup>OK: MOTIVATION AND GOALS

## S<sup>3</sup>OK'S STAKEHOLDER GROUPS

- **M-SISNet:** A representative panel of 2,200 Oklahoma households participating in the bi-annual Oklahoma Mesoscale Integrated Socio-geographic Network survey;
- **OLAN:** A panel of state opinion leaders recruited to be representative of the focus areas for the Oklahoma Opinion Leader Advisory Network
- **EPSAN:** An Extended Peer Science Network will consist of approximately 100 scientists, including an Internal EPSAN of approximately 50 Oklahoma research participants and an External EPSAN consisting of about 50 scientists from institutions outside Oklahoma.



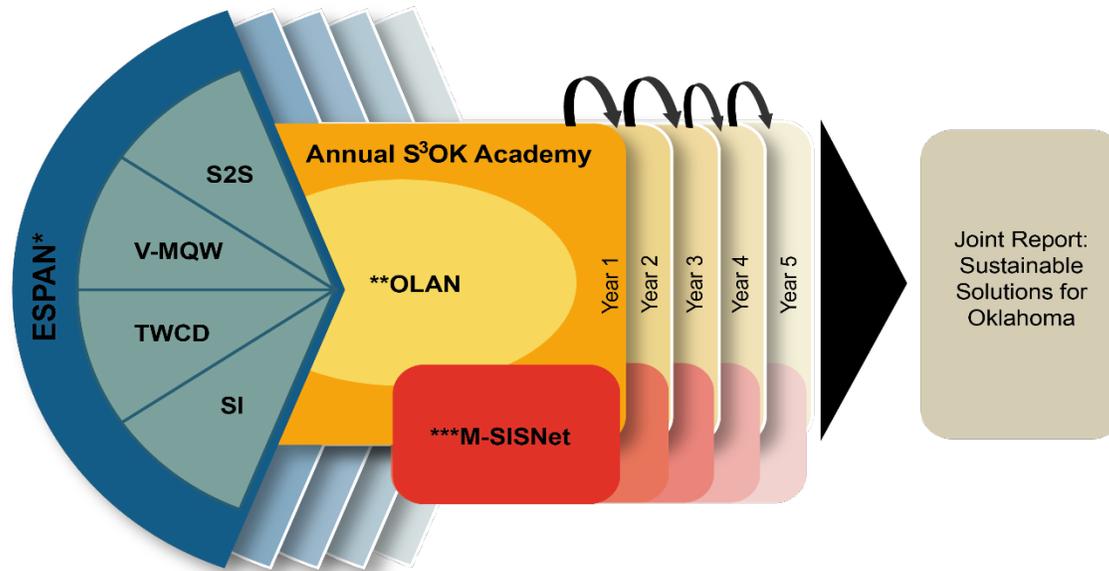
Publicly available data here:  
<https://crcm.shinyapps.io/s3ok/>

# S<sup>3</sup>OK: MOTIVATION AND GOALS

## THE ROLE OF S<sup>3</sup>OK'S STAKEHOLDERS

S<sup>3</sup>OK provides for systematic and iterative engagement among our focus area teams and stakeholders to explore the intersections and identify potential convergent solutions across the problem focus areas.

S<sup>3</sup>OK Program Components and Design.



- \* Extended Peer Science Advisory Network
- \*\* Opinion Leader Advisory Network
- \*\*\* Meso-Scale Integrated Socio-geographic Network - a panel survey of Oklahoma households

# *S<sup>3</sup>OK: MOTIVATION AND GOALS*

## **BRINGING THE RESEARCH TEAMS AND STAKEHOLDERS TOGETHER: S<sup>3</sup>OK'S ANNUAL ACADEMIES**

✓ **2021 – Focusing on identification of problem priorities over the next several decades for Oklahoma**

**2022 – What are the key challenges that impede solutions to our wicked problems?  
(MAY 2022)**

2023 – What solution sets can draw support from a coalition consisting of a diverse array of stakeholders?

2024 – Identify the technical and social bases for possible sustainable solution sets

2025 – Develop and disseminate a framework for finding possible sustainable solutions

**The primary objectives for the Annual 2022 S<sup>3</sup>OK Academy are:**

1. To provide the OLAN members with succinct overviews of the challenges that the science teams are addressing
2. To hear from the OLAN members what they think are the most critical problems within our focus areas.



THANK YOU!