

## **Broadening Participation**

Presenter:

Kevin Wagner, PD/PI  
Oklahoma NSF EPSCoR  
Oklahoma State University

# OKLAHOMA NSF EPSCoR: BROADENING PARTICIPATION

## Goals and Objectives

Overarching goals are to (1) build capacity to fill the state's future STEM-related jobs, with emphasis on Native Americans and women, and (2) ensure available human and institutional resources play a meaningful role in the project.

- Increase participation of underrepresented groups in the state, with special emphasis on women and Native Americans (Individual diversity)
- Engage regional and minority-serving institutions, as well as federal/state partners (Institutional diversity)
- Reach people in all areas of the state (Geographical diversity)

# OKLAHOMA NSF EPSCoR: BROADENING PARTICIPATION

## Objective 1 – Increase Participation of Underrepresented Groups in the State

### Related Tasks

- 1.1 College of the Muscogee Nation Native American Math and Science Instructors
- 1.2 Native American Student STEM Competition and Teacher Conference
- 1.3 Pontotoc Technology Center Environmental Biotech STEM Program
- 1.4 Southwestern Alliance for Girls' Enrichment in Science, Technology, Engineering, Arts, and Math Camp
- 1.5 Underrepresented Student Travel to Professional Meetings
- 1.6 Women in Science Conference

### PTC 8.2 – Diversity Recruitment and Retention

- Adding expertise in broadening participation in STEM disciplines to External Advisory Committee
- Employing recruitment practices designed to expand diversity of applicants & ultimately new hires
- Training participants on diversity and inclusion
- Active engagement of all project participants in co-production of knowledge and outreach

# OKLAHOMA NSF EPSCoR: BROADENING PARTICIPATION

## Disciplinary Diversity in Research: New Hires

### >60 new researchers joined our team in year 2

- >10 faculty (or equivalent)
- 8 post-docs
- >15 graduate students
- >30 undergrads

### 4 New Faculty Hires through S<sup>3</sup>OK project



Mary Foltz  
Asst. Professor  
Civil & Environ. Engineering  
Oklahoma State University



Kiran Mangalgi  
Asst. Professor  
Biosystems & Ag. Engineering  
Oklahoma State University



Arif Sadri  
Asst. Professor  
Civil Engineering & Environ. Science  
University of Oklahoma



Jia Yang  
Asst. Professor  
Natural Resource Ecology & Mgmt.  
Oklahoma State University

# OKLAHOMA NSF EPSCoR: BROADENING PARTICIPATION

## Diversity in Leadership: State Advisory Committee & External Advisory Committee

### State Advisory Committee

- 5 new members appointed with a focus on institutional and individual diversity

### External Advisory Committee

- 2 new members in 2022; 9 members total (5 women, 4 men; 2 Native Americans; 1 Black/African American)
  - 2 rotated off
- Committee make-up addresses multiple levels of diversity: disciplinary, geographic, institutional & individual

# OKLAHOMA NSF EPSCoR: BROADENING PARTICIPATION

## Broadening Individual Diversity - Accomplishments

Performance Metrics Table	Goals	Success Criteria	
		Y1	Y2
Female or URM** participants in research	15% of participants by 2021 and 20% by 2023	10%	17%
Number of Female participants in EPSCoR outreach and extension*	20% by 2021 and 30% by 2023	57%	51%
Number of URM** participants in EPSCoR outreach and extension*	20% by 2021 and 30% by 2023	28%	31%
Participants reached	156,900 (5-year total)	13,068	31,256

\*Goals are set for each outreach activity and are combined to determine the overall impact.

\*\*Native Americans, African Americans, Hispanics



# OKLAHOMA NSF EPSCoR: BROADENING PARTICIPATION

## Objective 2 – Engage Regional and Minority-Serving Institutions

### Related Tasks

2.1 Supporting research progress and increasing STEM education, infrastructure and growth through direct engagement (Research, Education & Workforce Development, Research Day at the Capitol)

### **PTC 8.6 – Increasing Research Capacity at Primarily Undergraduate & Minority Serving Institutions**

- Targeted funding for PUI-MSI Institutions (e.g., REUs, Seed Grants)
- Involvement of Researchers and/or Instructors from PUIs and MSIs
- Mentoring and Professional Development Opportunities
- Integrating Research into Instructional Curriculum
- Increasing Trainee Participation in S<sup>3</sup>OK Research
- Communication

# OKLAHOMA NSF EPSCoR: BROADENING PARTICIPATION

## Institutional Diversity - Accomplishments

### Who is Involved?

- 13 public colleges & universities engaged (25 in OK)
  - 2 research universities (2 in OK)
  - 8 regional universities (9 in OK)
  - 1 HBCU (1 in OK)
  - 1 public liberal arts univ. (1 in OK)
  - 1 community colleges (12 in OK)
- 1 career tech. center engaged (29 in OK)
- 2 private universities engaged (10 in OK)
- 1 tribal college engaged (1 in OK)

### Examples of Involvement

- Research (2 PUIs & 1 MSI)
  - ECU, LU, SWOSU
- REU – (3 PUIs & 1 private)
  - NSU, ORU, SWOSU, UCO
- EWFD – (3 PUI, 1 tribal, 1 MSI, 1 tech ctr.)
  - CMN, CU, ECU, LU, Pontotoc Tech Ctr, SWOSU
- Research Day at Capitol (8 PUIs, 1 tribal, 1 MSI, 1 community college)

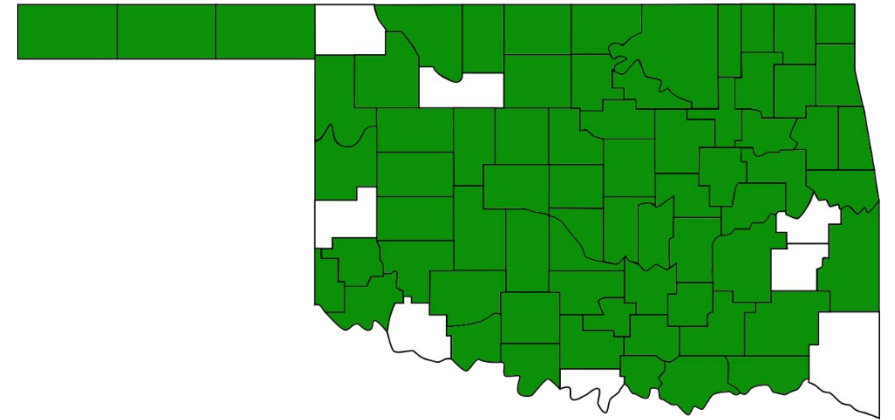


# OKLAHOMA NSF EPSCoR: BROADENING PARTICIPATION

## Objective 3 – Reach People in all Areas of the State (Geographic Diversity)

### Related Tasks

- 3.1 CU Engineering and Applied Math Summer Academy
- 3.2 4-H and Beyond: Youth Development and Educator Training
- 3.3 Supercomputing in Plain English
- 3.4 Research Day at the Capitol
- 3.5 OK Research Day
- 3.6 OMN Library Affiliate Program
- 3.7 Pontotoc Technology Center Environmental Biotech STEM Program
- 3.8 Southwestern Alliance for Girls' Enrichment in Science, Technology, Engineering, Arts, and Math Camp



### Accomplishments

- 69 of Oklahoma's 77 Counties Reached through S<sup>3</sup>OK Research & EWFD Programs

# OKLAHOMA NSF EPSCoR: BROADENING PARTICIPATION

Objectives	Primary Goals	Key Accomplishments	Status
<b>BP 1 - Increase participation of underrepresented groups in the state, with special emphasis on women and Native Americans (Individual diversity)</b>	<ol style="list-style-type: none"> <li>15% of participants from URGs by 2021 and 20% by 2023;</li> <li>sponsored activities' participation goals are 20% female &amp; URM by 2021 and 30% female &amp; URM by 2023</li> </ol>	<ol style="list-style-type: none"> <li>17% of participants from URGs</li> <li>sponsored activities' participation 51% female</li> <li>sponsored activities' participation 31% URM</li> </ol>	<b>On Schedule</b>
<b>BP 2 - Engage regional and minority-serving institutions, as well as federal/state partners (Institutional diversity)</b>	<ol style="list-style-type: none"> <li>Actively engage OK regional universities</li> <li>Engage Oklahoma's 1 HBCU</li> <li>Engage Oklahoma's 1 tribal college</li> </ol>	<ol style="list-style-type: none"> <li>8 (of 9) regional universities engaged</li> <li>1 HBCU engaged</li> <li>1 tribal college engaged</li> </ol>	<b>On Schedule</b>
<b>BP 3 - Reach people in all areas of the state (Geographical diversity)</b>	<ol style="list-style-type: none"> <li>Statewide reach through S<sup>3</sup>OK Research &amp; EWFD Programs</li> <li>Reach 156,900 participants by end of year 5</li> </ol>	<ol style="list-style-type: none"> <li>69 (of 77) counties reached</li> <li>44,324 participants reached (13,068 yr-1; 31,256 yr-2)</li> </ol>	<b>On Schedule</b>

# *OKLAHOMA NSF EPSCoR*

## **Emerging Areas and Seed Funding**

Presenter:

Kevin Wagner, PD/PI  
Oklahoma NSF EPSCoR  
Oklahoma State University

# OKLAHOMA NSF EPSCoR: SEED FUNDING

## Seed Grant Funding

1. RFP released in August 2021
  - Fund approx. five 1-year projects totaling up to \$75K each
2. Multiple deadlines for submission: September 15, 2021, January 15, 2022, and May 15, 2022
  - Plan to fund ~2 proposals per funding cycle
  - Allow responsiveness to opportunities/needs
3. Priorities
  - Advance research in at least one of the following (as identified by OLAN)
    - Water availability
    - Water quality
    - Aging and inadequate infrastructure
  - Achieve broader impacts
    - Help attract/leverage large grants
    - Involve PUI-MSIs
    - Involve early career faculty and/or URM

# OKLAHOMA NSF EPSCoR: SEED FUNDING

## Seed Grant Funding

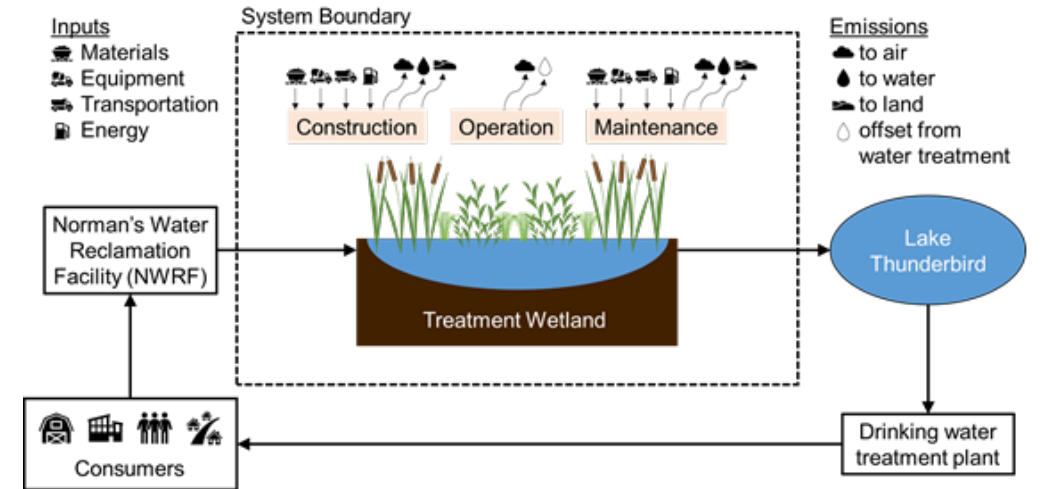
1. Proposals sent to members of Program and Administrative Councils for review
2. Results:
  - A. September 15, 2021 deadline – 17 submissions
    - Involved researchers from 6 OK universities
      - Cameron University, East Central University, Langston University, OK State University, University of OK, University of Tulsa
    - 1 proposal selected for seed grant funding (see next page)
    - Feedback from panel review provided to all applicants
  - B. January 15, 2022 deadline - 20 submissions
    - Involved researchers from 8 OK universities
      - Northeastern State Univ., Northern OK College, OK State Univ., Southwestern OK State Univ., Univ. of Central OK, Univ. of OK, Univ. of Tulsa, Western OK State College
    - **3 proposals recommended (involving 4 universities)**
3. Objective status: **On Schedule**

# OKLAHOMA NSF EPSCoR: SEED FUNDING

## Seed Funding Awards

### Project Title

- Life Cycle Assessment to Inform Design and Target Monitoring of a Treatment Wetland in Oklahoma to Promote Wastewater Reuse
- Dr. Mary Foltz, PI, OSU
- Objectives
  - 1: Quantify life cycle environmental impacts associated with design alternatives for potential wetland treatment systems at Norman Water Reclamation Facility
  - 2: Utilize uncertainty and sensitivity analyses to inform design and target monitoring of treatment wetlands



**Partnerships, Collaborations & Sustainability**

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# OKLAHOMA NSF EPSCoR

## Partnerships and Collaborations

- Deepening existing relationships
- Developing new relationships
- Opinion Leader Advisory Network (OLAN) – provides external perspectives on problems and associated solution sets developed through our research
- Extended Peer Science Advisory Network (EPSAN) – provides research expertise & expanded opportunities for collaboration with external institutions



# OKLAHOMA NSF EPSCoR: RESEARCH COLLABORATIONS

Category	Within Jurisdiction but Not <u>Solely Among Participants</u>		External to the Jurisdiction <u>U.S. Domestic</u>		External to the <u>Jurisdiction-Foreign</u>	
	<u>Number of Institutions</u>	<u>Number of Collaborators</u>	<u>Number of Institutions</u>	<u>Number of Collaborators</u>	<u>Number of Institutions</u>	<u>Number of Collaborators</u>
Academic Research Institution	3	7	17	19	5	5
National Laboratory	1	1	6	8	0	0
Business/Industry Groups	3	3	1	1	0	0
Other (Specify)	6	15	3	3	0	0
<b>Total</b>	<b>13</b>	<b>26</b>	<b>27</b>	<b>31</b>	<b>5</b>	<b>5</b>
<b>Other Categories:</b>						
Other Non-Profit	2	11	2	2	0	0
State or Local Government	4	4	0	0	0	0
K-12	0	0	1	1	0	0

**Details on collaborators will be provided during Evaluation presentation**

# *OKLAHOMA NSF EPSCoR: SUSTAINABILITY*

## **Sustainability**

- Building and sustaining competitive research infrastructure
- Achieved by:
  - Increasing human capacity
  - Cultivating local and external collaboration
  - Improving physical infrastructure
  - Developing new and diverse funding sources

# OKLAHOMA NSF EPSCoR: SUSTAINABILITY

## Increasing Human Capacity

### New faculty hires

- College of the Muscogee Nation
  - Mathematics Instructor
  - Science Instructor
- University of Oklahoma
  - Resilience, Computational Social Science
  - Transportation Engineering
  - Social Hazard Modeling/Data Analytics
- Oklahoma State University
  - Unit Processes for Water Management
  - Water Quality Engineering
  - Fire Modeling

# OKLAHOMA NSF EPSCoR: SUSTAINABILITY

## Increasing Human Capacity

- Expanded research opportunities for new postdocs & graduate students
- Professional development of future leaders
  - Mentoring – senior faculty mentor the involved junior faculty, new faculty hires, and postdoctoral researchers in grant writing and professional development
  - Training – opportunity for EPSCoR faculty, postdoctoral researchers & graduate students to enhance grant preparation & tech-writing skills
  - Collaboration
    - Internal
      - Team engagement
      - Research Retreats
    - External
      - Annual Academies
      - Travel to present at conferences

# *OKLAHOMA NSF EPSCoR: SUSTAINABILITY*

## **Increasing Human Capacity**

- Providing STEM education & capacity at levels reaching K-12, undergraduate, and graduate students
- Providing Summer Research Experience for Undergraduates (REU)
- Providing Underrepresented Student Travel to Professional Meetings

# OKLAHOMA NSF EPSCoR: SUSTAINABILITY

## Cultivating Local and External Collaboration

- M-SISNet – greater awareness of public priorities & viewpoints
- OLAN – greater awareness of issues/priorities and access to potential funding and critical local partners
- EPSAN – greater linkage to external research community
- Emerging Areas and Seed Funding – Teams of inter-institutional research collaborators, including the regional institutions, are provided opportunities to propose new research projects in emergent research areas

# *OKLAHOMA NSF EPSCoR: SUSTAINABILITY*

## **Improved Physical Infrastructure**

- Mobile eddy flux tower system for measuring carbon, water, and energy fluxes
- sUAV remote sensing system (equipped with multi-spectral, thermal and LiDAR sensors) for acquisition of image data
- Expanded data storage & processing capability

# OKLAHOMA NSF EPSCoR: SUSTAINABILITY

## Developing New and Diverse Funding Sources

### Federal Funding

- NSF Collaborative Research: Growing Convergence Research (GCR)
- NSF Collaborative Research: Paleo Perspectives on Climate Change (P2C2)
- NSF Directorate for Geosciences
- Nat'l Oceanic & Atmospheric Admin. (NOAA)
- Sandia National Laboratories
- U.S. Army Corps of Engineers
- U.S. Geological Survey
- U.S. Dept of Agriculture
- U.S. Dept of Defense
- U.S. Dept of Edu
- U.S. Dept of Housing & Urban Development
- U.S. Environmental Protection Agency (EPA)

### Local/State Funding

- City of Tulsa
- Oklahoma Center for the Advancement of Science and Technology
- Oklahoma Dept of Environmental Quality
- Oklahoma Dept of Transportation
- Oklahoma Medical Research Foundation

<u>Proposals / Grants / Contracts</u>	<u>Number</u>	<u>Funds requested</u>
Submitted	125	\$98.3 M
Awarded	44	\$18.4 M