Agenda
CONSERVE Mid-Atlantic Advisory Panel Meeting

Room 110, Lower Level
Monday, December 5th
Annapolis, MD

12:00 Sign-In

WORKING LUNCH

12:15 Introductions (Paul Goeringer, Project Co-Director)

12:30 Overview of CONSERVE (Dr. Amy Sapkota, Project Director)

12:50 Overview of Mid-Atlantic Extension Team and Activities (Mayhah Suri, Project Assistant)

1:00 Review of Advisory Group Expectations (Daphne Pee, Project Coordinator)

1:15 BREAK

1:30 Review of Mid-Atlantic Needs Assessment (Teresa McCoy, University of Maryland Extension, Assistant Director of Evaluation and Assessment)

2:00 Group Discussion (Ashley Ellixson, Project Co-Director; Daphne Pee)

2:45 Wrap-up & Next Steps

3:00 Adjourn

CONSERVE

A Center of Excellence at the Nexus of Sustainable Water Reuse, Food, and Health

Amy R. Sapkota, PhD, MPH

CONSERVE Mid-Atlantic Advisory Panel Meeting

December 5, 2016

Background

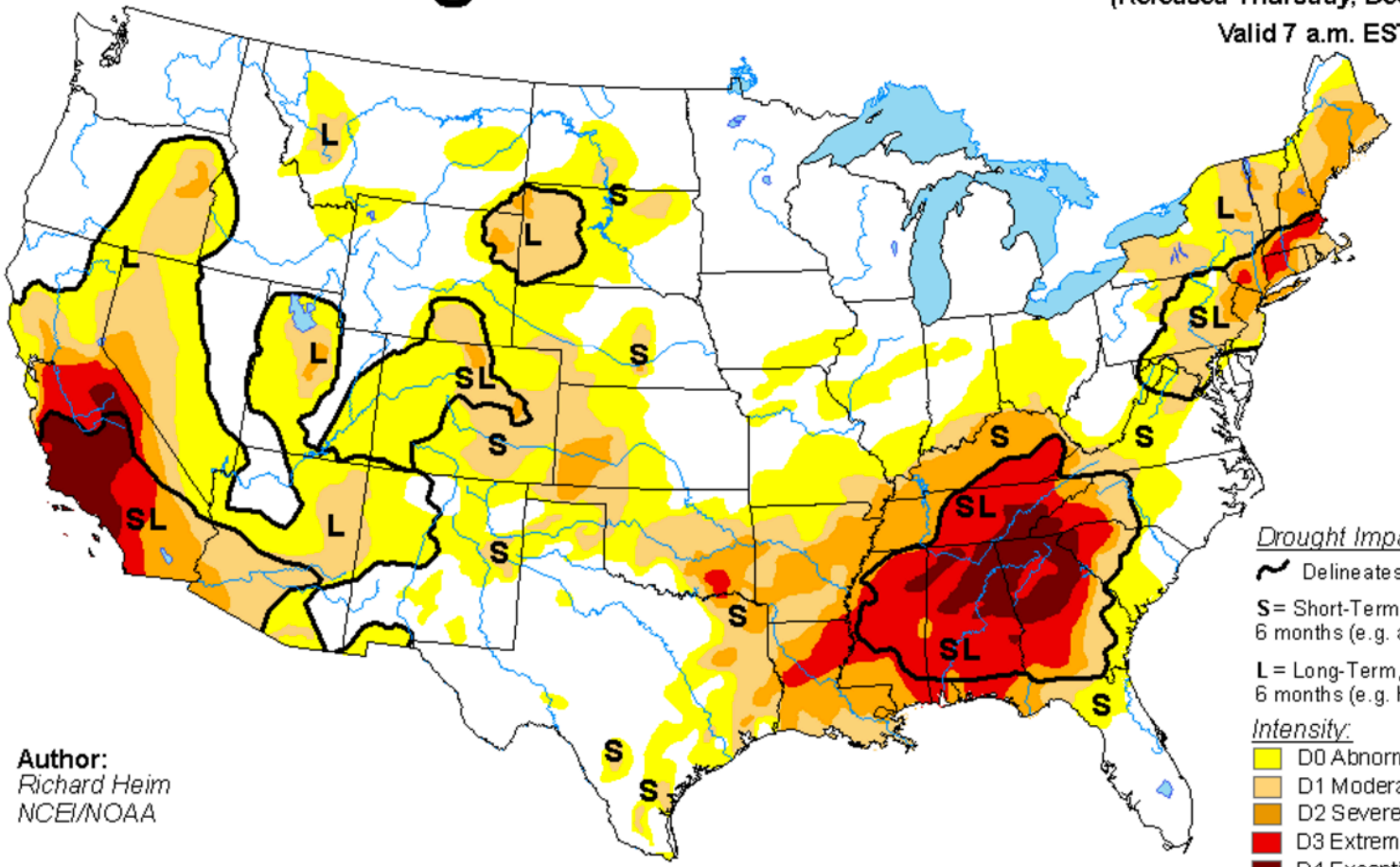
- Ongoing climate variability is placing severe stress on high-quality water sources used for agricultural irrigation
- Water reuse and the exploration of "nontraditional" irrigation water sources have become national priorities
- Food Safety Modernization Act is shifting the focus of food safety from responding to contamination to preventing it
  - Agricultural producers must meet stricter guidelines concerning the quality of irrigation water used on food crops
- Sustainable on-farm water treatment solutions are needed to enable agricultural producers to conserve groundwater through the <u>safe use of emerging nontraditional water sources</u>

U.S. Drought Monitor

November 29, 2016

(Released Thursday, Dec. 1, 2016)

Valid 7 a.m. EST



Author:
Richard Heim
NCEI/NOAA

Drought Impact Types:

Delineates dominant impacts

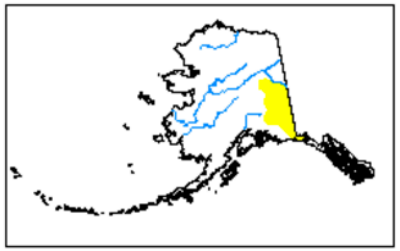
S = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)

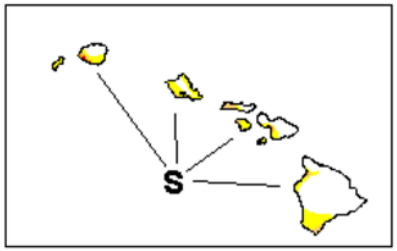
L = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)

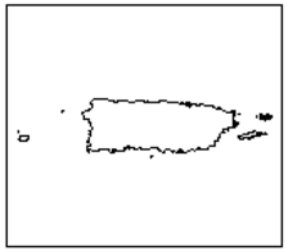
Intensity:

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.







USDA

National Drought Mitigation Center

NOAA

http://droughtmonitor.unl.edu/

CONSERVE

A Center of Excellence at the Nexus of Sustainable Water Reuse, Food, and Health

Our Mission: *To facilitate the adoption of transformative on-farm solutions that enable the safe use of nontraditional irrigation water on food crops.*

Our Vision: *To be a national resource bringing together research, outreach, and education to effectively reduce the nation's agricultural water challenges that are exacerbated by climate change.*

CONSERVE Transdisciplinary Team

Research **Extension**

Education

CONSERVE Systems-based Approach

Objective 1

NONTRADITIONAL IRRIGATION WATER SOURCES *RESEARCH*

- **Quantity:** Identify, quantify, map and classify
- **Quality:** Evaluate chemical, microbial, and physical quality

Objective 2

SOCIETAL CONTEXT *RESEARCH*

- Understand factors that impact consumer response to agricultural water reuse
- Legal analysis of cases, statutes, regulations about water reuse

Objective 3

NEXT-GENERATION ON-FARM TECHNOLOGIES *RESEARCH*

- Evaluate on-farm water treatment technologies
- Implement the most successful solutions on farms in the Mid-Atlantic and Southwest

CONSERVE

Center of Excellence

Objective 4

INNOVATIVE EXTENSION AND OUTREACH

- Needs & risk assessments
- Advisory panels and workshops
- Multimedia resources
- eXtension Community of Practice
- Certificate program

Objective 5

EXPERIENTIAL EDUCATION

- Active learning methods
- Open educational resources
- CONSERVE Scholars Program
- Workshops, field trips, and lab practicums

Objective 1:

NONTRADITIONAL IRRIGATION WATER SOURCES (*RESEARCH*)

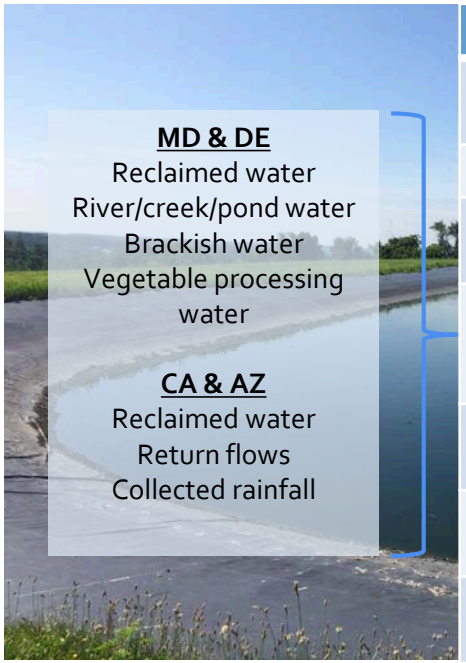
Evaluate the availability (quantity and quality) of nontraditional irrigation water sources that can be used to conserve groundwater

Study Areas: Maryland, Delaware, California and Arizona

Activity 1a: Quantity

Identify potential water sources that best meet local water management needs → Classify them in terms of quantity, quality, ease of access → Make these data accessible via user-friendly spatial databases → Develop Decision Support System

Activity 1b: Quality



Analytical Methods
Chemical and physical water quality parameters
Bacterial Indicators
Pharmaceuticals and personal care products (LC/MS)
Next-generation sequencing approaches (Illumina MiSeq/HiSeq)
Bacterial Pathogens (e.g. *Salmonella, Listeria)*
Viral Pathogens (e.g. adenovirus, reovirus)
Protozoal Pathogens (e.g. Cyclospora)

Objective 2:

SOCIETAL CONTEXT (*RESEARCH)*

Identify the social, behavioral, economic and regulatory factors that impact the current use of nontraditional irrigation water sources and might impact the integration of new on-farm water treatment technologies developed to treat these sources

Activity 2a: Social, behavioral and economic factors impacting consumer response to water reuse

How much people will pay for this food (experiments)?

Why people will pay for this food (surveys)?

Evaluate why some people won't consume this food

Activity 2b: Legal, regulatory and policy frameworks for water reuse

Domestic water law research
(Two regions representing two primary regimes of US water law)

International water law research

Objective 3:

NEXT-GENERATION ON-FARM TECHNOLOGIES (*RESEARCH*)

Develop, implement and evaluate the effectiveness and sustainability of next-generation on-farm water treatment technologies that can improve the chemical, microbial and physical quality of nontraditional irrigation water sources and irrigated food crops

Activity 3a: Zerovalent iron biosand filtration (Mid-Atlantic team)

Combination of sand, zerovalent iron, and gravel is used to filter potentially contaminated irrigation water

Activity 3b: UV and ozone systems (Southwest team)

Testing combinations of UV and ozone treatment systems

Objective 4:

INNOVATIVE EXTENSION AND OUTREACH

Integrate the knowledge generated through Objectives 1, 2 and 3 into preeminent extension and outreach programs for agricultural and nonagricultural communities

Goals: *Develop extension and outreach programs on the benefits of adopting nontraditional irrigation water sources based on the research and discoveries of other CONSERVE activities*

Objective 5:

EXPERIENTIAL EDUCATION

Translate the knowledge generated through Objectives 1, 2 and 3 into high-quality, experiential educational programs that will teach, train and inspire the next generation of leaders engaged in sustainable water reuse on food crops

Activity 5a: Experiential Education

- **Goal:** To develop active-learning based educational modules
- K-12 and College students; Consumers
  - Instructional Content
    - Project-based learning
    - Videos with storyboards, animations
  - Utilize Creative Commons License
- Train educators through workshops with input from advisory committee

Activity 5b: CONSERVE Scholars Program

- **Goal**: To train a diverse group of future leaders educated in sustainable water reuse and systems-based thinking.
- Undergrads
  - CONSERVE Summer Internship Program (SIP)
  - UMD First-Year Innovation & Research Experience (FIRE)
- Grad students and Post-docs
- International CONSERVE Scholars

CONSERVE Cores: Laboratory, Data Management and Analysis, and Administrative

Laboratory Core:

- **Laboratory Information System (LIMS)**
  - Consistent labeling via barcodes
  - Well-documented sample chain of custody
- **State-of-the Art contaminant detection:**
  - Exposome Small Molecule Facility (LC-MS/MS)
  - Total bacterial, fungal and viral diversity (16SrRNA and metagenomic sequencing)

Data Management and Analysis Core:

- Data storage and sharing
- Interface with LIMS
- Data analysis, visualization and dissemination

Administrative Core:

- Financial support
- Reporting
- Communications
- Coordination

CO-PROJECT DIRECTORS

Ashley Ellixson (University of Maryland College Park)
Charles Gerba (University of Arizona)
Paul Goeringer (University of Maryland College Park)
Fawzy Hashem (University of Maryland Eastern Shore)
Kalmia Kniel (University of Delaware)
Kent Messer (University of Delaware)
Shirley Micallef (University of Maryland College Park)
Masoud Negahban-Azar (University of Maryland College Park)
Michael Pappas (University of Maryland Baltimore)
Robert Percival (University of Maryland Baltimore)
Sadhana Ravishankar (University of Arizona)
Channah Rock (University of Arizona)
Manan Sharma (United States Department of Agriculture, Agricultural Research Service)

CORE DIRECTORS

Mihai Pop (University of Maryland College Park)
Amir Sapkota (University of Maryland College Park)
Debra Weinstein (University of Maryland College Park)

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Jitendra Patel

CONSERVE

A Center of Excellence at the Nexus of Sustainable Water Reuse, Food, and Health

Mayhah Suri

December 5th, 2016

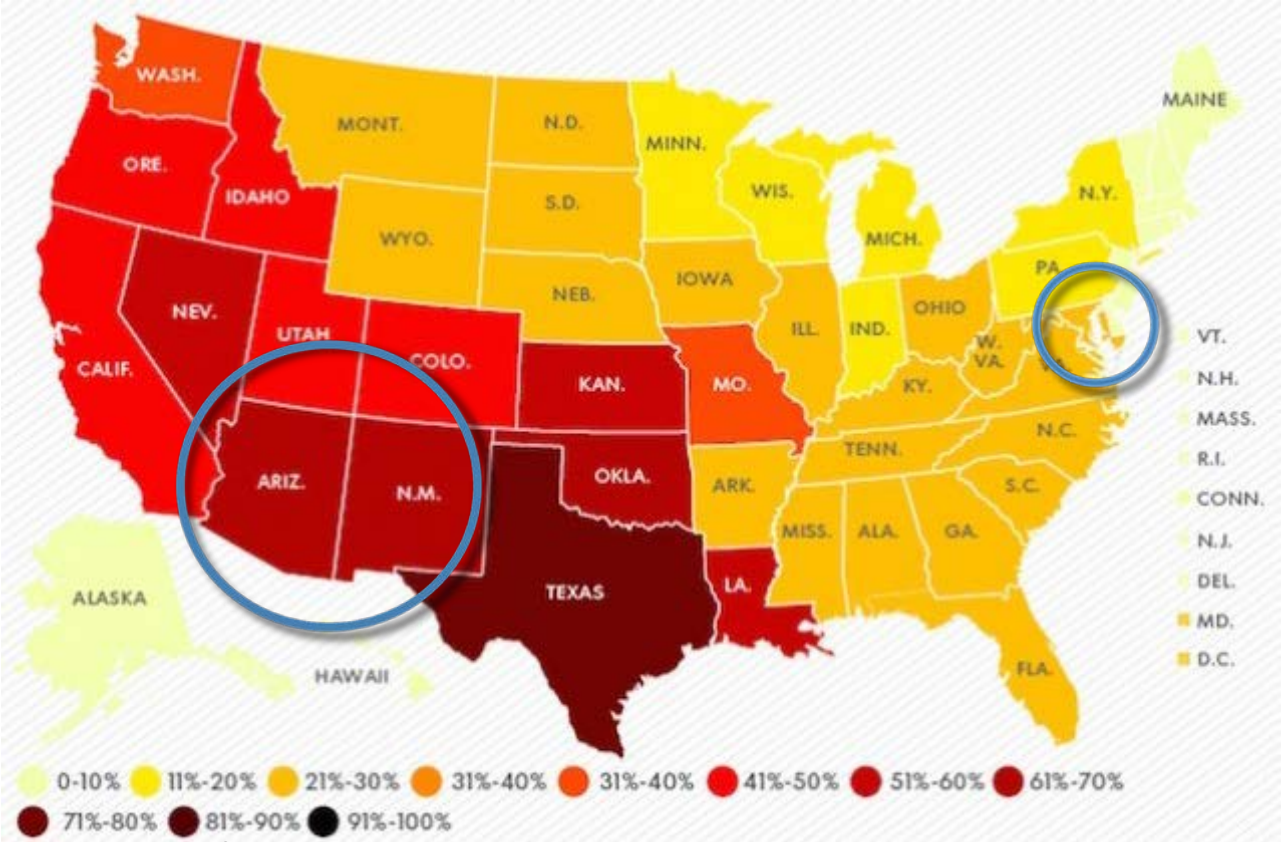
conservewaterforfood.org

CONSERVE Objectives

1. **Nontraditional Irrigation Water Sources** *(Research)*
2. **Societal Context** (*Research*)
3. **Next-Generation On-farm Technologies** (*Research*)
4. **Innovative Extension and Outreach:** Integrate the knowledge generated through Objectives 1, 2 and 3 into preeminent extension and outreach programs for agricultural and nonagricultural communities (***Extension***)
5. **Experiential Education** *(Education)*

Where is CONSERVE Extension?

Southwest: 61-70% chance of decade-long drought
Mid-Atlantic: 11-30% chance of decade-long drought



Lamont Doherty Earth Observatory of Columbia University; U.S. Drought Monitor; Cornell University Doyle Rice, Frank Pompa and Julie Snider

Who

CONSERVE Team

- Bioscientists
- Engineers
- Economists
- Social-behavioral scientists
- Policy experts
- Educational media developers
- Computer scientists
- **Extension specialists**

Mid-Atlantic Extension Team

- Ashley Ellixson
- Paul Goeringer
- Daphne Pee
- Rachel Goldstein
- Mayhah R Suri
- Plus partners and collaborators in Arizona, Delaware, New Mexico

Extension Products

- Needs Assessment
- Risk Assessment
- eXtension Community of Practice on non-traditional sources of water for agriculture
- Publications and resources based on CONSERVE project findings
- Half-day workshops
- Multimedia website to house all materials in an accessible and user-friendly platform
- Best Management Practices toolkit
- Certificate program

Needs Assessment

- Assess current understanding of nontraditional water resources
- Concurrent with Southwest assessment
- Goal is as many Mid-Atlantic produce irrigation users as possible
  - E-version, clicker, and paper will be available

Discussion Points for CONSERVE Extension Advisory Panel Meeting

December 5, 2016 Discussion Points

- Are we on the right track?
  - Are we targeting growers effectively?
  - Are there other meetings we should be attending?
- How can you help us distribute the needs assessment?
- How should we introduce the needs assessment to growers?
- When and how do you want updates from us?

Up next…

- Next meeting?
  - Present results from needs assessment

Expectations for CONSERVE Extension Advisory Panel Members

Advisory Panel Roles & Responsibilities

- Review materials, plans, resources, and other materials we have developed to educate producers and agricultural, environmental, and public health stakeholders
- Provide guidance on how to improve our products and plans to effectively achieve our goals
- Publicize our products and events through your respective networks
- Help us identify additional stakeholders to interact with as the project progresses
- Facilitate linkages with other projects and organizations to leverage interests and resources

Advisory Panel Time Commitment

- Attend 2-3 in-person meetings per year
- Attend online meetings or conference calls as needed, about 1-2 sessions per year

Extension Team Responsibilities

- Keep Advisory Panel members informed of our efforts
- Share our products and plans for your review and guidance
- Promote your efforts through our networks to facilitate linkages with potential partners
- Coordinate meetings for Advisory Panel
- Coordinate travel reimbursements