



WATERREUSE

# WaterReuse DPR Initiative Update

Julie Minton  
DPR In CA: Specialty Seminar  
Berkeley, CA  
September 23, 2015





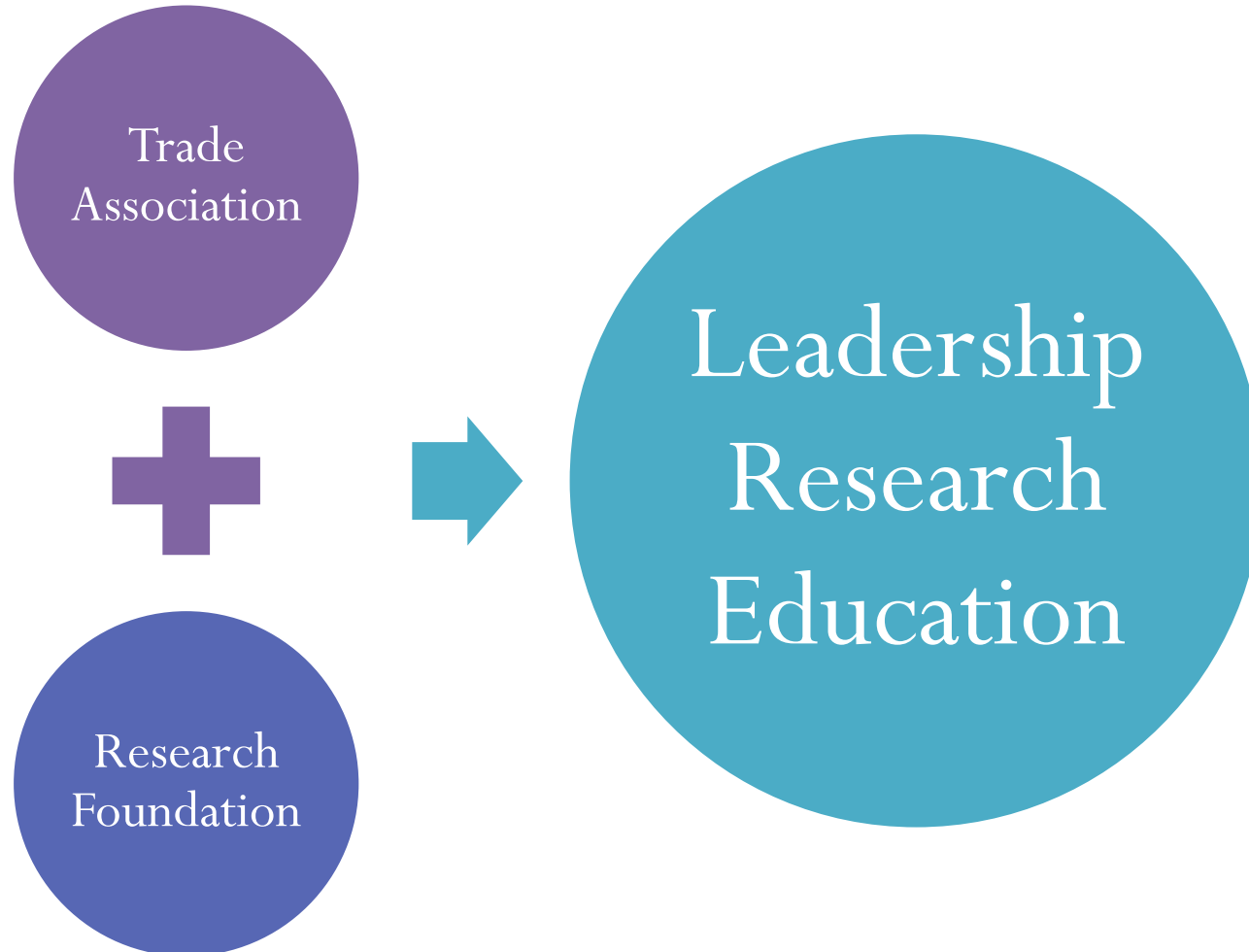
WATERREUSE



# Some Background on WaterReuse



# The WaterReuse Story: Who We Are, What We Do



# What is needed?

## *The Right Water for the Right Use*



### Leadership

- Funding Advocacy
- Policy Development and Implementation

### Research

- Applied
- Timely
- Robust

### Education and Outreach

- Message development
- Tool development
- Tiered Campaigns



# Research Growth and Successes

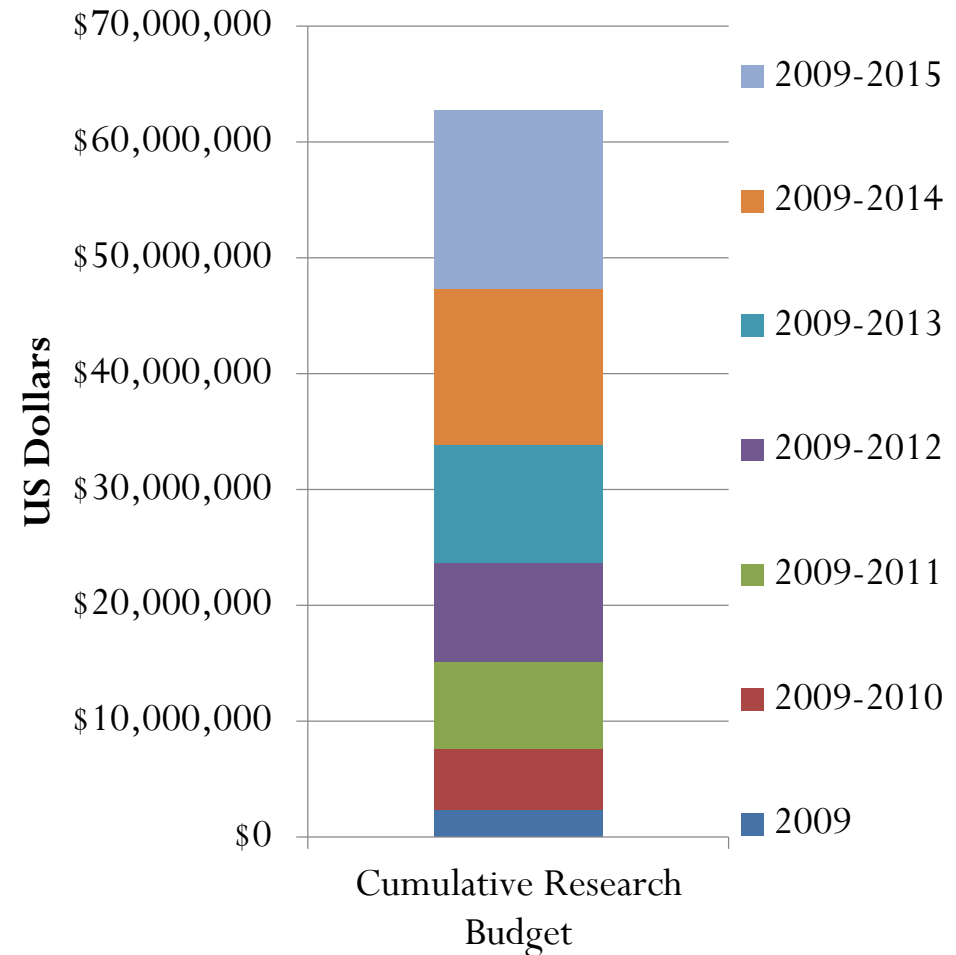
## *Since 2000...*

- 210 projects commissioned
- \$30.5M in funding from WaterReuse
- Over \$66M in leveraged funding
- 152 published reports
- 58 active projects

## *So far in 2015...*

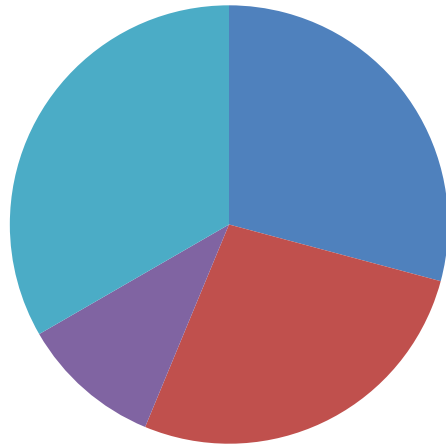
- 13 projects launched
- **\$2M** in WRRF funding, leveraged by additional **\$3M** (and counting)
- 10 published reports

**WRRF Cumulative Research Funding 2009-  
Present**

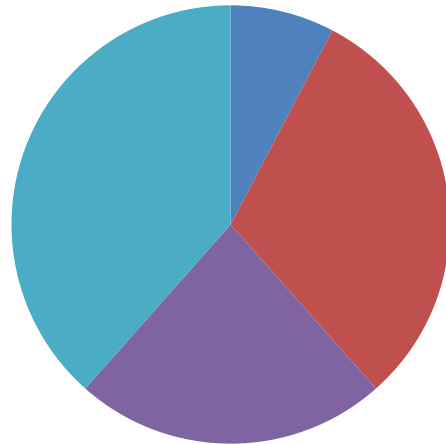


# WRRF Research Focus Areas

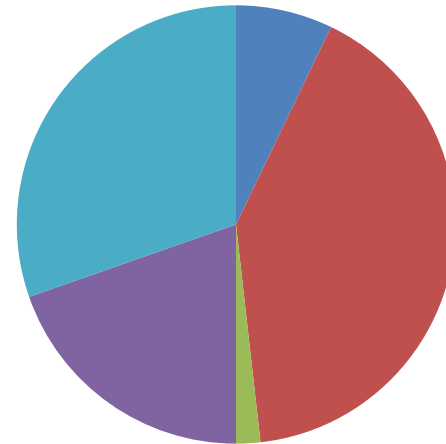
2001 - 2004



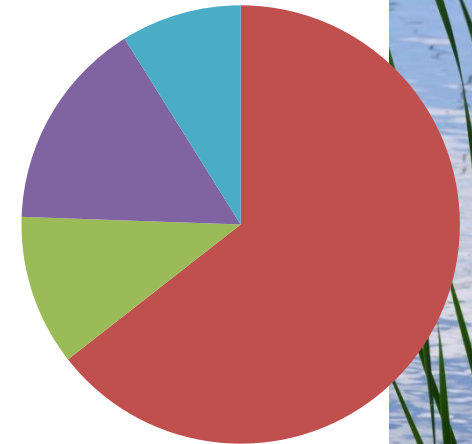
2005 - 2008



2009 - 2012



2013 - Present



- Non-Potable Reuse
- Potable Reuse
- Industrial Reuse
- Desal/Salinity Mgmt
- Social Science





WATERREUSE



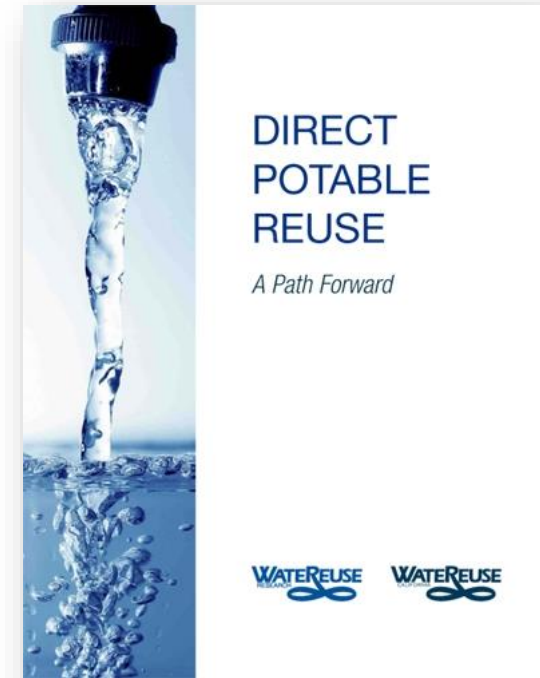
# The Direct Potable Reuse (DPR) Initiative

An Overview



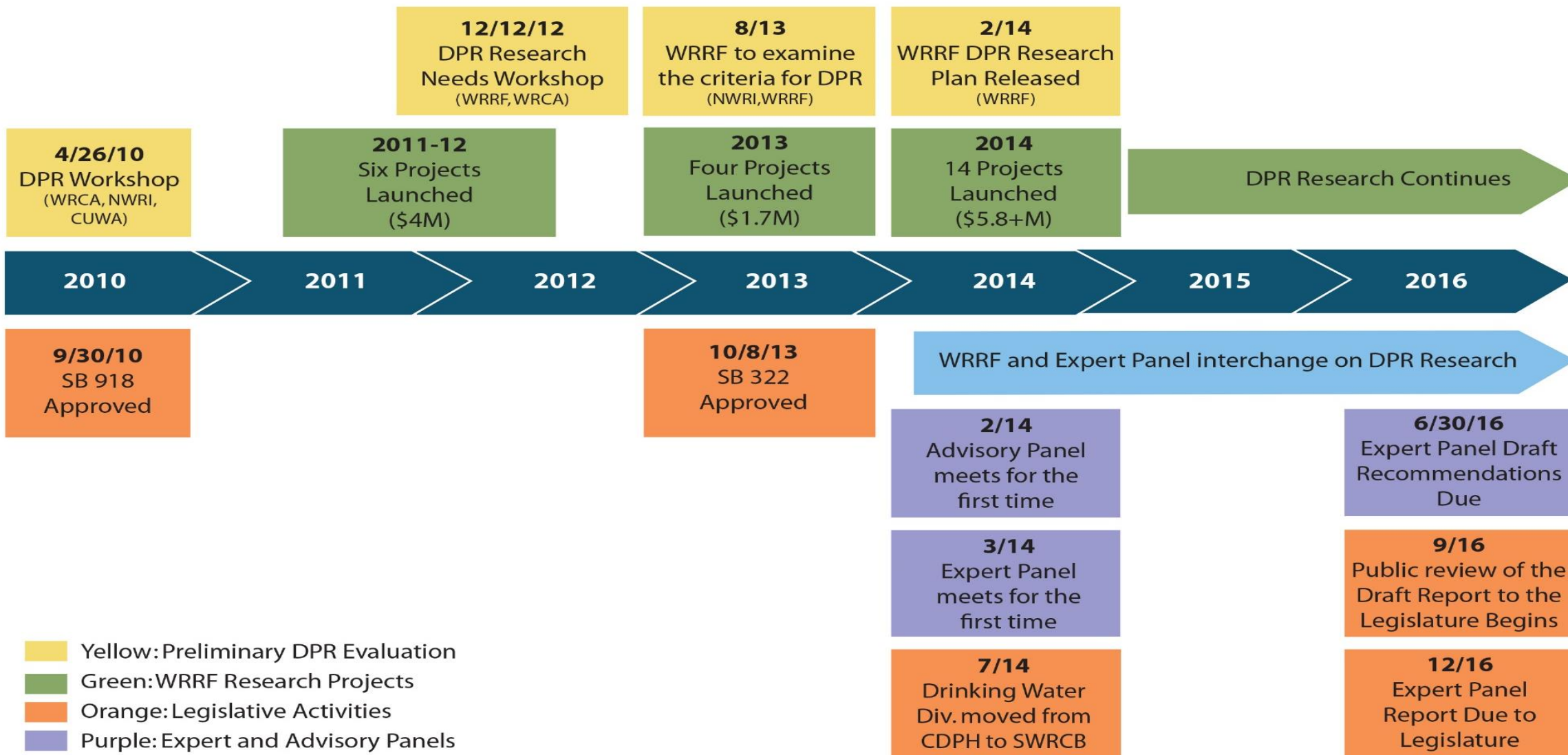
# DPR Initiative

- **Partnership of WRRF and WRCA**
- **Goals**
  - Rigorous research (WRRF)
  - Stakeholder awareness & acceptance (WRCA)
  - Regulations for DPR (SWRCB DDW)
- **US \$6 million raised**
- **Research priorities center around potable reuse as a supply solution to water scarcity/availability across the US -- CA, TX, NM, AZ, CO, GA, etc.**





# DPR Initiative Timeline



# DPR Interactions

◆ = Meeting  
▶ = Deadline

Advisory Panel:

Expert Panel:

DPR Research:

Legislated Dates:

Draft Expert Panel DPR Report ▶

Final Report on DPR Feasibility ▶



# New Release: Framework for DPR



**WATERREUSE**



American Water Works  
Association

Purpose: To provide an overview of the key elements that make up a DPR program and a framework for assessing the specific topics and issues that need to be addressed in the development of future DPR Guidelines.

# WRRF Project Advisory Committee

- Katherine Y. Bell, MWH Global
- Erica Brown, Association of Metropolitan Water Agencies
- Margaret H. Nellor, Nellor Environmental Associates, Inc.
- Philip Oshida, U.S. Environmental Protection Agency, Office of Groundwater and Drinking Water
- Valerie Rourke, Virginia Department of Environmental Quality
- Steve Via, American Water Works Association

## **WRRF Project Manager**

- Justin Mattingly





# Independent Advisory Panel

- George Tchobanoglous, Ph.D., P.E., NAE, BCEE (Panel Chair) *University of California, Davis*
- Joseph Cotruvo, Ph.D., BCES *Joseph Cotruvo & Associates, LLC*
- James Crook, Ph.D., P.E, BCEE *Environmental Engineering Consultant*
- Ellen McDonald, Ph.D., P.E. *Alan Plummer Associates, Inc.*
- Adam Olivieri, Dr.P.H., P.E. *EOA, Inc.*
- Andrew Salveson, P.E. *Carollo Engineers, Inc.*
- R. Shane Trussell, Ph.D., P.E., BCEE *Trussell Technologies, Inc.*

## **Editors**

- Jeff Mosher and Gina Melin Vartanian *National Water Research Institute*

# Organization of the DPR Framework

Chapters 1 - 4

Introduction

What is DPR?

Key Components of a Successful/Sustainable DPR Program

Public Health Protection

Chapters 5 - 8

Source Control

Wastewater Treatment

Advanced Water Treatment

Purified & Finished Water Management

Chapters 9 - 13

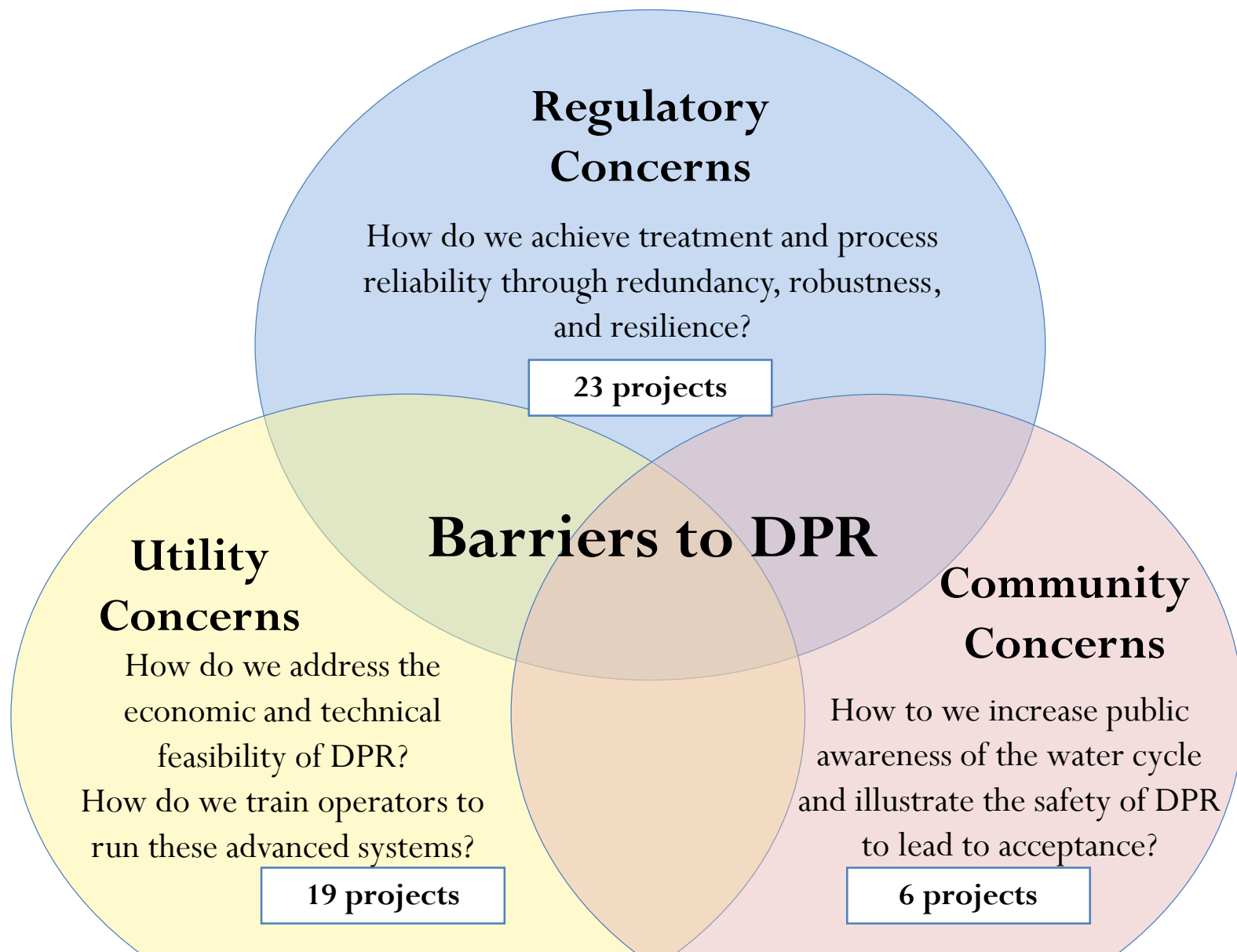
Monitoring and Instrumentation Requirements

Residuals Management

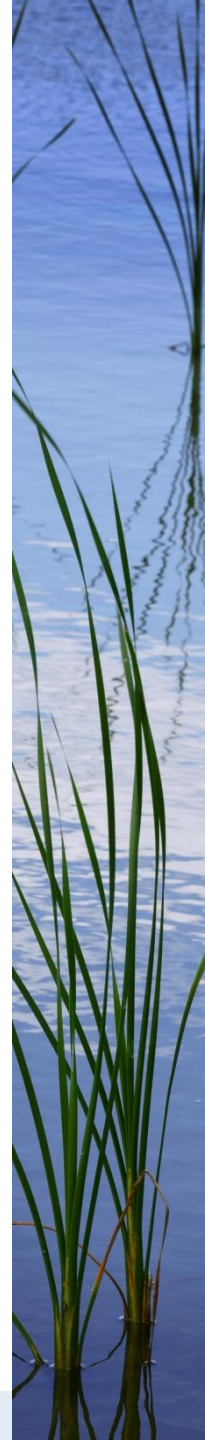
Facility Operation

Public Outreach

Future Developments



*WRRF DPR research program worth over \$20M is underway to address these concerns & illustrate the feasibility of DPR*



# Research is currently addressing these questions

Research Area	Number of WRRF Projects
Demonstration of Reliable, Redundant Treatment Performance	19
Critical Control Points	5
Operations, maintenance, and training/certification	5
Pathogens: Surrogates, Credits	16
Pathogens: Rapid/Continuous Monitoring	10
Failure and Resiliency	10
Removal and risk of constituents of concern	9
Evaluation of Potential DPR Trains	14
Source Control	2

*Projects can cover multiples areas of research*



# Research is currently addressing these questions

Research Area	Number of WRRF Projects
<b>WRRF-15-01: Potable Reuse Research Compilation: Synthesis of Findings</b>	
Demonstration	
Critical Control	
Operations, m	
Pathogens: Su	
Pathogens: Ra	
Failure and R	
Removal and	
Evaluation of	
Source Control	
<i>Projects can cover multiples areas of research</i>	

**WRRF-15-01: Potable Reuse Research Compilation: Synthesis of Findings**

The goal of this project is to summarize and synthesize the results, pulling from outside research where needed, and package this information by topic into a cohesive document. This summary report will be presented to the DDW Expert Panel as part of the Foundation’s ongoing efforts to provide relevant DPR research findings and will also be useful to other regions interested in Potable Reuse.

# Project Team and Support



Jeff Mosher – PI;  
Gina Vartanian – Editor

## Authors

George Tchobanoglous – technical  
lead, lead editor  
2-3 authors being selected by topic



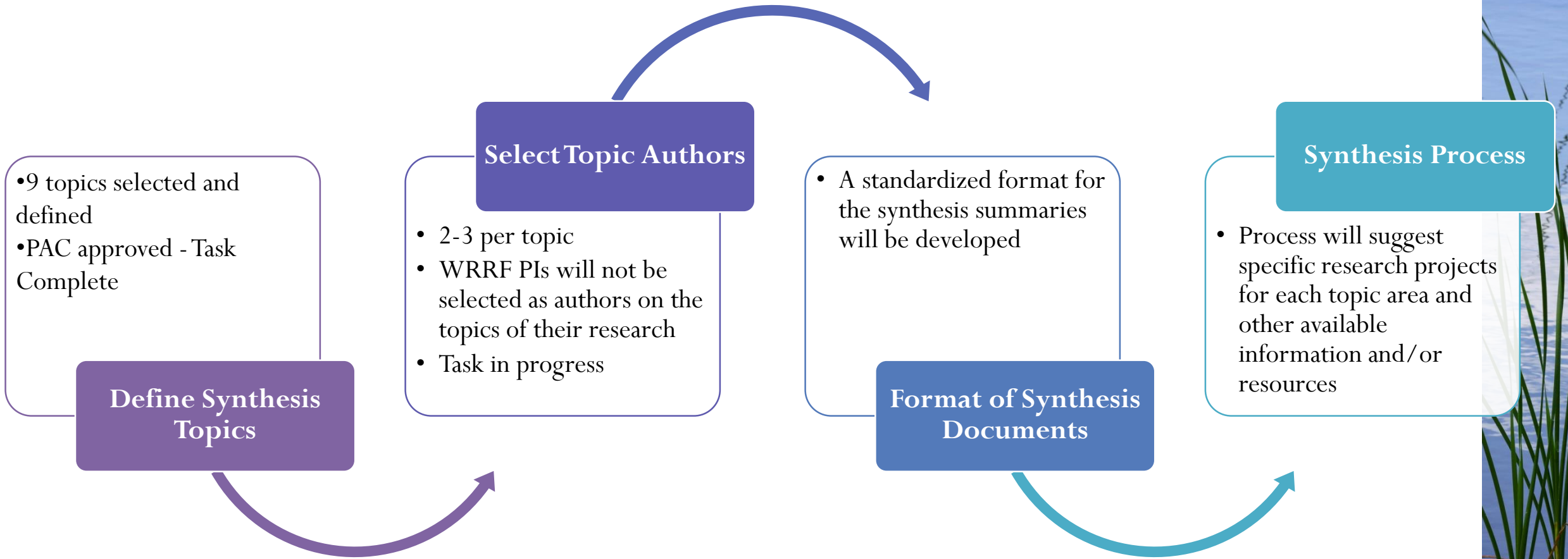
## PAC

Jim Crook, *Environmental  
Engineering Consultant*  
Bob Hultquist, *Retired CDPH*  
Jing-Tying Chao, *SWRCB DDW*  
Mike Wehner, *OCWD*  
Serge Haddad, *LADWP*  
Amy Dorman, *San Diego*  
Katie Henderson, *WRF*

PM: Julie Minton

Funding Support from SWRCB and Singapore PUB, in kind from NWRI

# Project Approach



# DPR Topics

Demonstration of  
reliable, redundant  
treatment  
performance

Critical control  
points

Operations,  
maintenance,  
training/certification

Pathogens:  
surrogates and  
credits

Pathogens:  
rapid/continuous  
monitoring

Failure and resiliency

Removal and risk of  
constituents of  
emerging concern

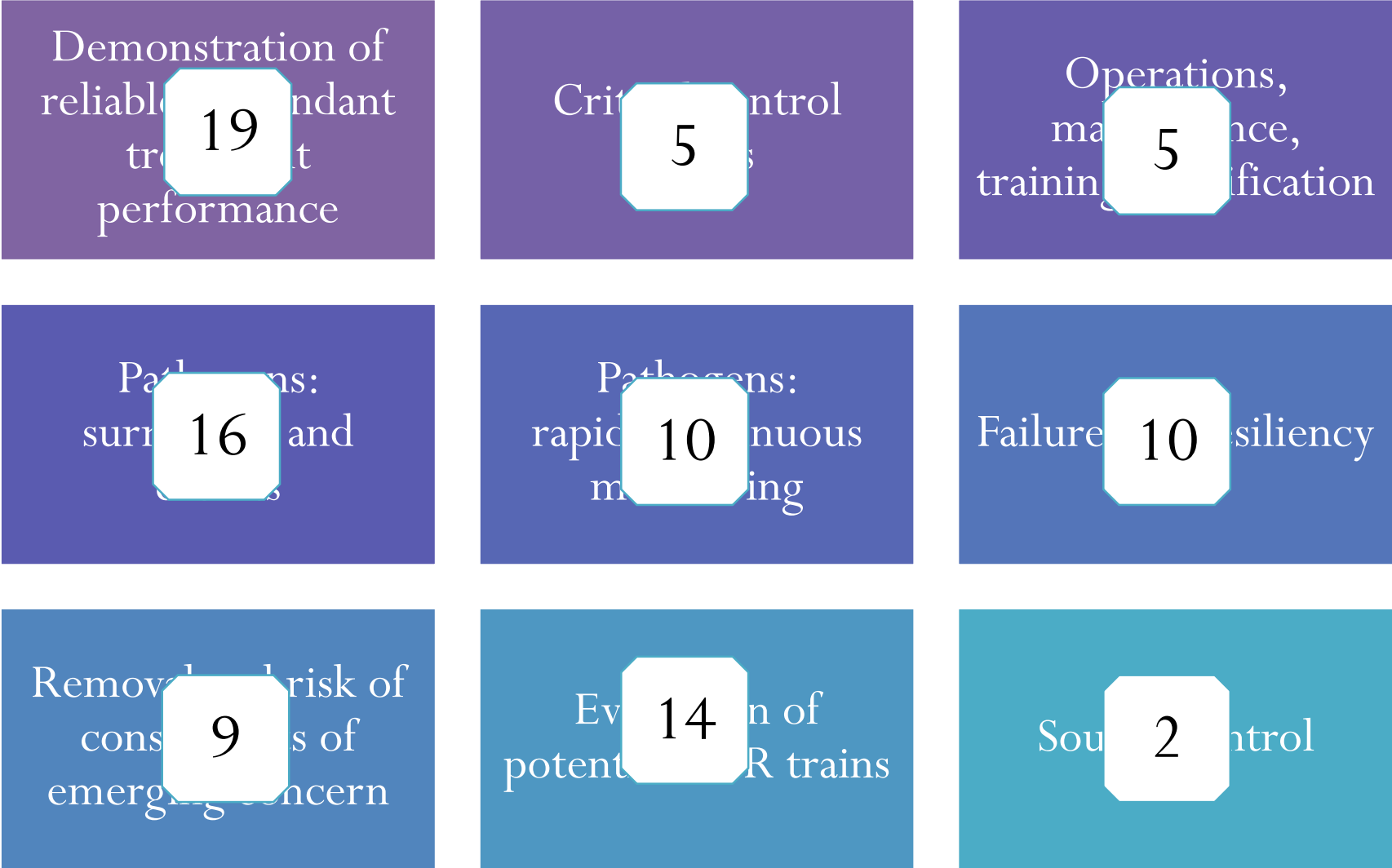
Evaluation of  
potential DPR trains

Source control





# DPR Topics & Number of associated WRRF projects



# Example Topic Description

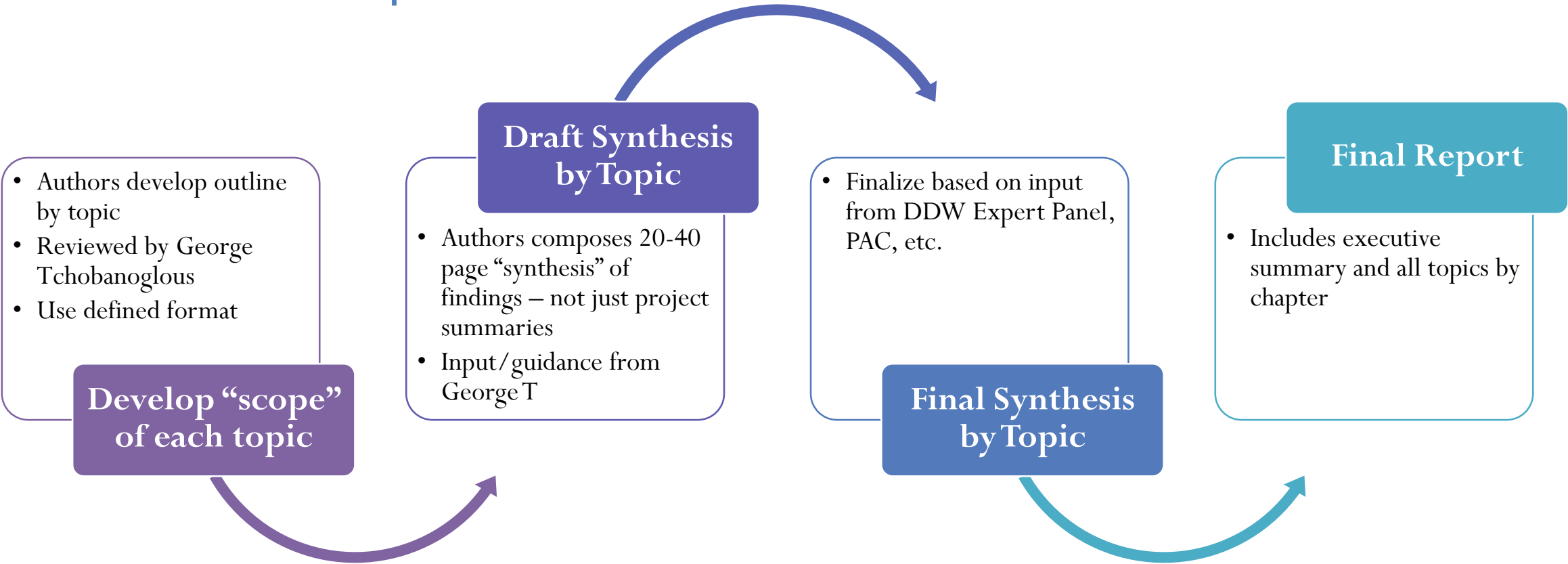
## **1. Demonstration of reliable, redundant treatment performance**

The purpose of this synthesis is to review the how reliability can be demonstrated through the performance on a DPR treatment system.

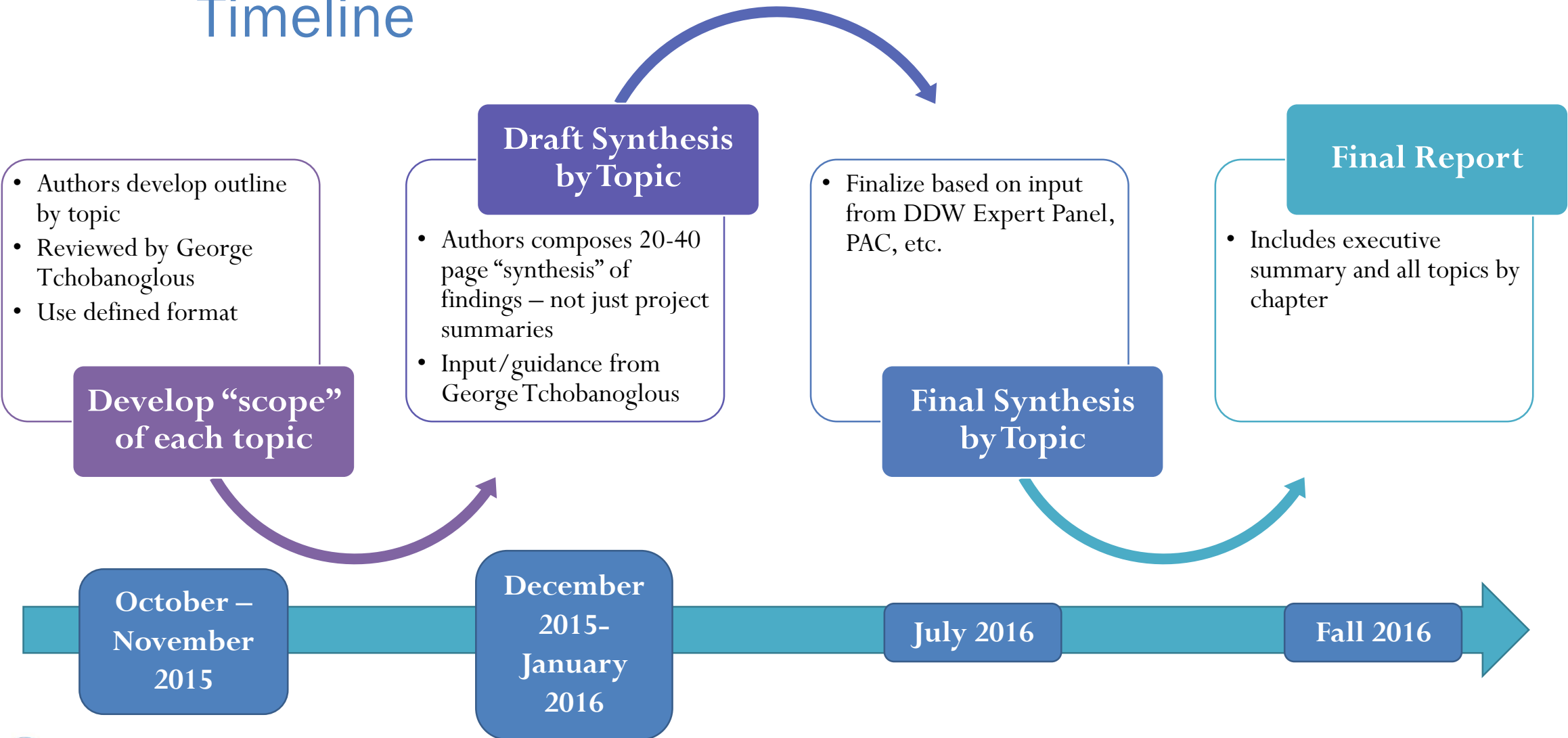
Reliability is the ability of a treatment process or treatment train to consistently achieve the desired degree of treatment, based on its inherent redundancy, robustness, and resilience. Reliable treatment is a measure of the ability of a system to distribute water that meets all requirements protective of public health and includes design, operation, maintenance, and source control. The reliable production of advanced treated water depends upon the use of redundant, robust, and resilient treatment technologies.



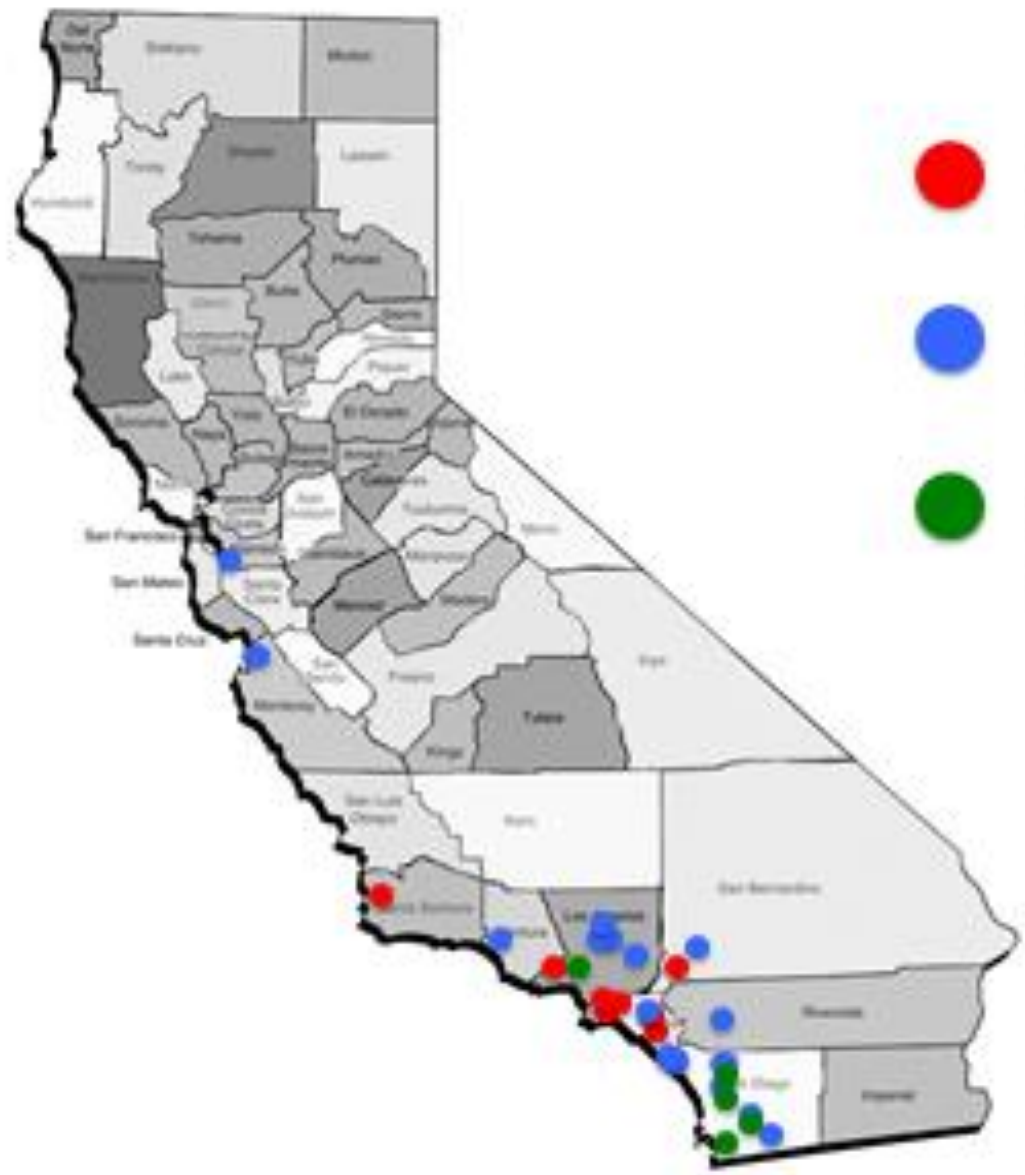
# Final Reports



# Timeline







- PERMITTED GROUNDWATER (8)**  
Existing  $\approx$  200,000 AFY  $\sim$  1.6 M People
- PLANNED GROUNDWATER (17)**  
Planned  $\approx$  221,000 AFY  $\sim$  1.6 M People
- PLANNED SURFACE WATER AUGMENTATION (6)**  
Planned  $\approx$  100,000 AFY  $\sim$  800,000 People

