FY16-19 Program Overview and Roadmap Posters

An overview poster has been provided for the SSWR Research Program and for the Nitrogen and Co-Pollutant Roadmap.

Safe and Sustainable Water Resources Research Program

EPA United States Environmental Protection Agency

Watershed Sustainability

National assessment of watershed sustainability using indicators of ecological condition and economic and social benefits

Project 1

Assess, map, and predict the integrity, resilience, and restoration potential of the Nation's water resources

- National Aquatic Resource Surveys (NARS)
- Water resource condition and watershed integrity
- Watershed resilience, recovery potential and sustainability
- Wetlands/stream connectivity

Project 2

Science to support new or revised aquatic water quality criteria to protect human health and aquatic life – pathogens, contaminants, and CECs

- Ambient Water Quality Criteria for chemical/microbial contaminants
- Human health and aquatic life protection
- Advanced tools/technologies for chemical of emerging concern

Project 3

Assess life-cycle impacts of water, energy, mineral, and materials nexus

- Wastewaters from energy/mineral extraction
- Underground injection practices
- Decision support tools for water availability/use
- Cumulative impacts on aquatic life
- Risks of current, transitioning, and emerging technologies/practices

Project 4

National water-quality benefits

- National water-quality benefits modeling framework
- Economic and water-quality studies – (five water body types)
- Optimal choice metrics for economic analyses
- Economic valuation of water-quality improvements

Green Infrastructure

Develop and demonstrate tools to assess effectiveness and benefits for managing water volume and improving water quality

Project 1

Green Infrastructure Models and Tools

- Model and tool gap analysis
- GI model and tool development and enhancement
- Model and tool evaluation and application

Project 2

Support increased adoption of green infrastructure into community stormwater management plans and watershed sustainability goals

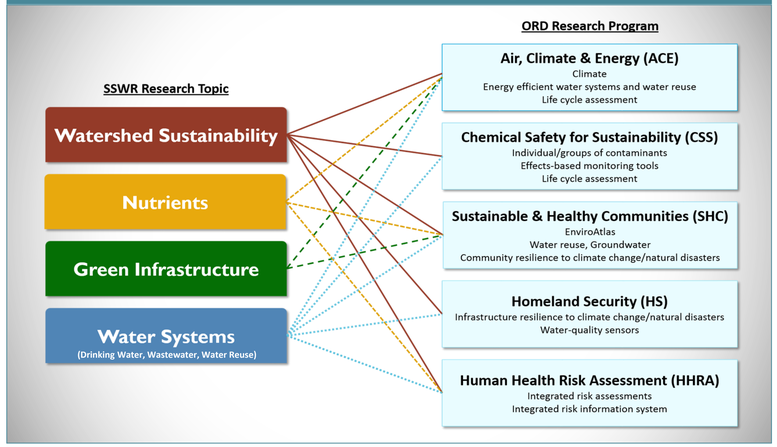
- Information and guidance through community partnerships
- Place-based GI research
- GI Impacts to groundwater quantity and quality
- Natural GI

Program Overview

The interrelated challenges of impaired water quality, diminished water availability, the Nation's aging water infrastructure and inadequate knowledge of the value of water-quality benefits threaten safe and sustainable water resources. These challenges are further amplified by a host of current and emerging environmental stressors, including climate change and variability, extreme events, population change, and evolving trends in land use, energy, agriculture and manufacturing.

The SSWR research program uses an integrated, systems approach to support innovative scientific and technological solutions that ensure clean, adequate and equitable supplies of water to protect human health and to protect and restore watersheds and aquatic ecosystems.

National Program Integration



Nutrients

Assess ecosystem, economic and social benefits of management actions for sustainable nutrient loading

Project 1

Reducing impacts of Harmful Algal Blooms

- Management strategies
- Causes and modeling
- Health, ecosystem, & socio-economic impacts
- Analysis and monitoring

Project 2

Science to Inform the Development of Nutrient Thresholds and Targeting Actions

- Improved nutrient indicator development
- Ecosystem response & recovery to nutrients
- Nutrient sources & relative contributions to impairment

Project 3

Science to Improve Nutrient Management Practices, Metrics of Benefits, Accountability and Communication

- Innovative management practices
- Monitoring & modeling of decision alternatives and nutrient reductions
- Science enabling effective communication

Water Systems

Alternative approaches to water systems to meet goals of public health protection and energy efficient resource recovery and reuse

Project 1

Current Systems and Regulatory Support

- Provide timely support to program and regional offices on monitoring and treatment of, exposure to, and impacts from contaminants

Project 2

Next Steps: Technology Advances

- Develop and advance new technologies and approaches for monitoring, treating, assessing risk in water systems

Project 3

Transformative Approaches and Technologies for Water Systems

- Evaluate transformative approaches for holistic water management: From source to tap and back to source

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EPA Nitrogen and Co-Pollutant Roadmap: Addressing a *Wicked* Problem

United States Environmental Protection Agency

Anne Rea, ORD Lead; Mary Reiley, OW Lead; Randy Waite, OAR Lead

Walt Nelson, SSWR; Robin Dennis, ACE; Jana Compton, SHC; Hal Walker, NHEERL; Tara Greaver, HHRA

Problem Summary & Decision Context

ORD Research Roadmaps:

- Describe coordination/collaboration with EPA & federal partners & others
- Catalyze integration across ORDs six research programs
- Identify research gaps & make recommendations for future work
- Focused on a small number of cross-cutting issues:
  - N & Co-pollutants
  - Climate Change
  - Children's Environmental Health
  - Environmental Justice

Nitrogen and Co-Pollutants issues challenge traditional pollution regulatory systems across media, regulatory boundaries, regional divides & state borders

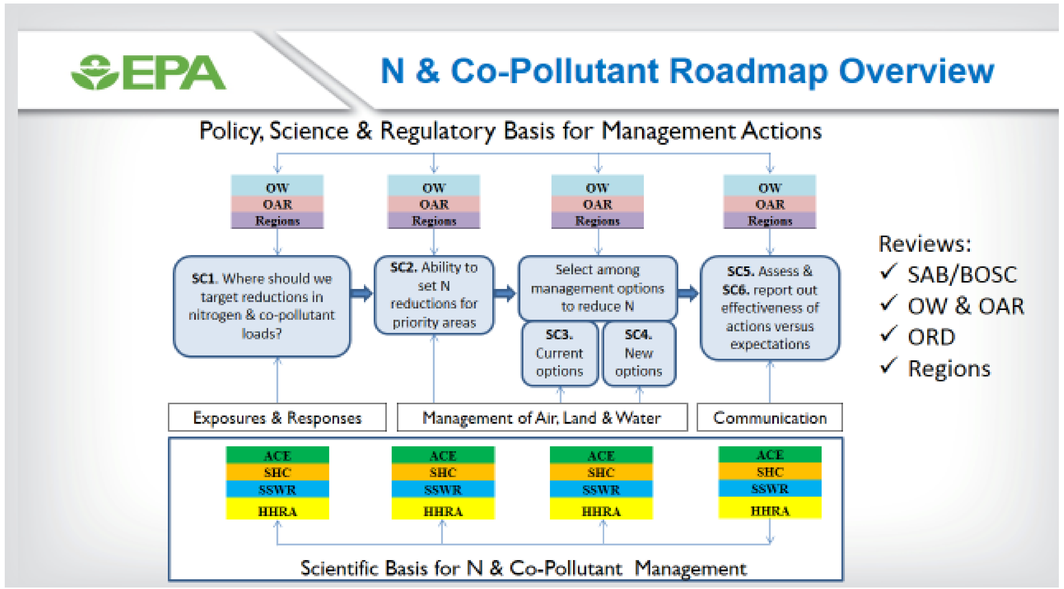
Utility to Agency?

Multi-Office approach to addressing N and Co-Pollutants through:

- Integrated, multi-disciplinary science and research
- Coordinated Program policy and implementation
- Science Challenges designed to address OW, OAR, Region, and State program objectives and goals

Overarching Outcome: Reduced and avoided ecological and public health impacts from N and co-pollutants to air, water, and land

Overarching Output: Models, tools & technologies that incorporate scientific, social, economic & cross-media factors to inform regulatory & non-regulatory solutions to excess N & co-pollutants



Examples of Roadmap Identified Gaps

Data & Models:

- Data & models that better tie N & co-pollutant related water quality impairments to quantitative loads
- Critical review of models for N & co-pollutant management

Technologies & Tools:

- Rapid, cost effective technologies for monitoring water quality response to management actions
- Methods to improve source apportionment & attribution for N & P at multiple scales

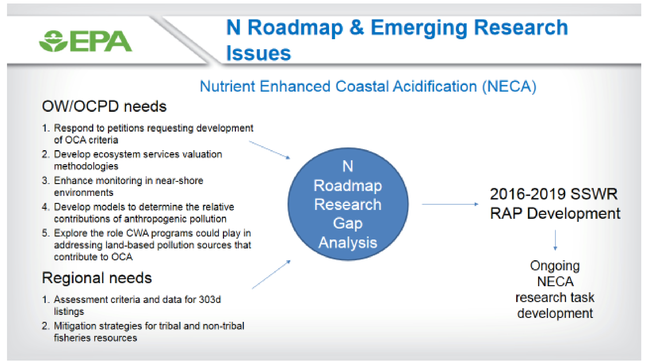
BMPs:

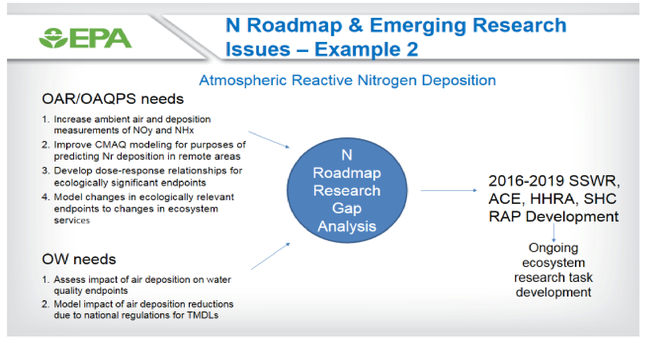
- Compile, assess & synthesize new approaches to meeting N & P reduction goals
- Quantify intervention costs and benefits of BMPs for N & P reduction

Cross-ORD/OW/OAR Research:

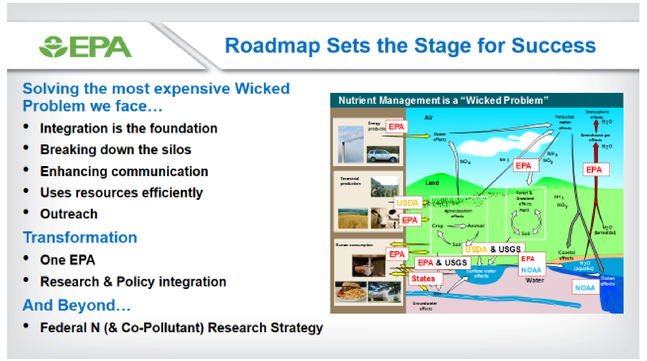
- Multi-media modeling & case studies representing full suite of N-cascade connections
- Impact of Climate change on N & co-pollutants

Future Directions





Partner Engagement Opportunities



Nitrogen & Co-Pollutant Roadmap