The CLEAN CENTER

Center for Comprehensive, OptimaL and Effective Abatement of Nutrients (CLEAN)

The physical system

The Center will identify nutrient removal and recovery solutions in wastewater, urban stormwater, cropland, animal feeding operations, and riparian sectors.

The people and policy

The Center will identify effective incentives for adoption of sustainable nutrient management solutions in agriculture, utilities, and public works agencies, and will build approaches for nutrient credit trading programs.

Decision making tools

The Center will improve the Nation's capacity to protect the environment and public health by developing practical and widely transferable modeling, data and decision tools for risk and performance assessment of nutrient controls.

Control of nutrient pollution to U.S. waterways is an urgent issue for the nation. In 2013, the U.S. Environmental Protection Agency selected Colorado State University to lead a multi-stakeholder effort to study and control the sources of excess nutrients in wastewater, stormwater, agricultural water, and natural systems.

The Center activities connect natural and physical systems, human actions, and policy to create innovative solutions to nutrient pollution problems. Sustainable nitrogen (N) and phosphorus (P) management solutions for restoring watershed systems and attaining designated uses will be developed and demonstrated. These sustainable solutions will integrate abatement strategies for urban, agricultural, and riparian systems, and effective policy instruments (incentives and market-based approaches) that facilitate trading among sectors, provide equity along water systems, increase chance of adoption, and minimize costs.

The Mission of the CLEAN center is to create knowledge, build capacity, and forge collaboration to develop and demonstrate sustainable solutions for reduction of nutrient pollution in the nation's water resources.

Sustainable N and P Solutions

- Wastewater Treatment Technologies
- Water Reuse Systems
- Urban stormwater Management Systems
- Agricultural Conservation Practices
- Socioeconomic Incentives
- Nutrient Trading
- Water Law and Water Rights

Partnership

The CLEAN center follows a triple helix model of collaboration between private sector, academic institutions and local government organizations. The core university partners include Colorado State University (CSU), North Carolina University (NCSU), University of Colorado-Boulder (CU), and University of California-Irvine (UCI). Leading water quality and hydrology modeling and decision analysis scientist from the United Sates Department of Agriculture-Agricultural Research Service (USDA-ARS) and Unites States Geological Survey (USGS) provide the capacity for seamless integration of the CLEAN center activities with tools developed by government agencies for control of excess nutrients in water courses. The City of Fort Collins and Metro Wastewater Reclamation District personnel represent the viewpoint of local stakeholders for development of effective and efficient technologies.

Join us

We seek partners from industry, local governments, researchers from other academic institutions, non-profit organizations, and general members of the public to enhance the research, demonstration, and dissemination of nutrient solutions. Please contact us to learn how to engage in the CLEAN Center.

A Triple Helix Partnership

CLEAN Projects

❖ Understand the Physical System:

Project 1: Achieving Nutrient Reductions through Innovative Approaches for Wastewater Management and Water Demand Reduction

Project 2: Urban Stormwater Management-Evaluation of Simple Retrofits/Design Enhancements and Development of Simple Assessment Tools

Project 3: Nutrient Reductions in Agricultural Watersheds: Intentional Planning, Implementation, and Maintenance

Project 4: Fluvial Instability and Riparian Degradation: Evaluating and Reducing Nutrient Loading from Channel-Riparian Interfaces

❖ Understand People and Policy:

Project 5: Effective Incentives and Viable Trans-Sectoral Trading Strategies

❖ Enhance the Decision Making Process:

Project 6: Accessible Nutrient Data, Analysis and Modeling Dashboard for the Nation

Project 7: Assessing Nutrient Management Tradeoff and Targets under Uncertainty

Indicate Partnership level

□ Project sponsorship
□ Science Advisory
□ Citizen Advisory

Contact Information:

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