

# ORD's Center for Environmental Measurement and Modeling (CEMM)

*Protecting human health and the environment by delivering innovative measurement and modeling solutions to EPA and our partners*





# CEMM Research Mission

**CEMM develops, evaluates, and applies measurements and models to characterize the sources, occurrence, transformation, transport and effects of pollutants and stressors in the natural environment.**

The results of CEMM research will:

- Provide fundamental methods and models required to implement environmental statutes.
- Position the Agency and its partners to take advantage of innovations in measurement and modeling science.
- Identify approaches and tools to inform effective management of water/airsheds and ecosystems.
- Generate data to inform human and ecological exposure, health, and risk assessments.

To fulfill this mission, CEMM scientists will collaborate and partner within and outside of ORD to deliver solutions-driven research that is responsive and impactful.

What

Why

How



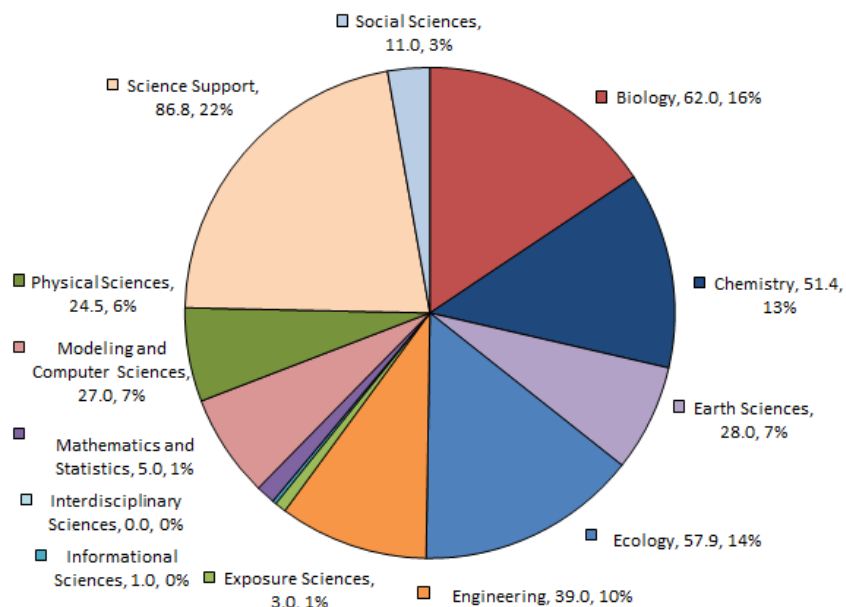


# CEMM Locations

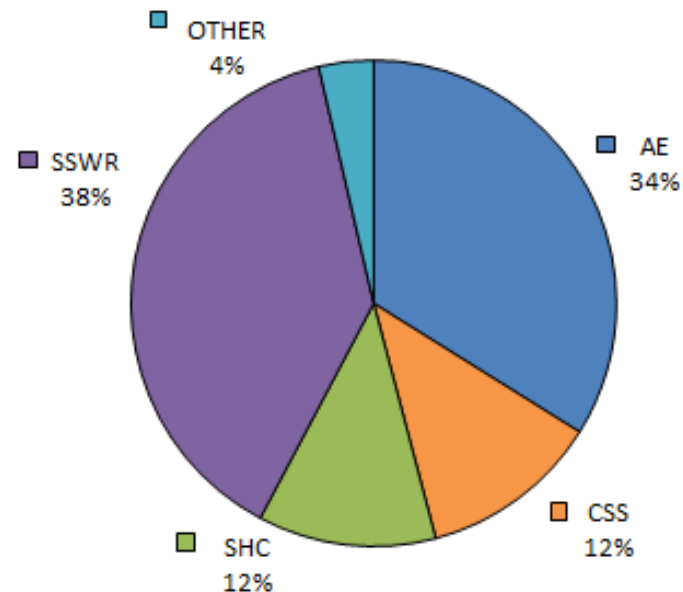
- **6 Divisions, 5 geographic locations**
- **CEMM total of 365 FTEs**
  - **43 Managers/Supervisors**
  - **283 Scientific positions (78% of CEMM)**
    - 202 scientist/engineers
    - 81 support scientists/technicians
  - **39 Administrative and Operational Support Staff**
- **CEMM FY21 Budget - \$42M ( $\frac{1}{2}$  operations and facility costs,  $\frac{1}{2}$  programmatic research)**



## FTE by Disciplines (All FTE)



## National Programs (Science FTE Only)





# CEMM Research in SSWR

- CEMM is conducting research in all three SSWR topic areas: Watersheds, Nutrients and Water Treatment and Infrastructure (WTI), with the largest investments in Watersheds and Nutrients
- CEMM is involved in WTI, both with leadership and PI involvement
  - Output leads: 3 of the 12 outputs are led by CEMM PIs
  - Product contacts: 4 of the 42 products are managed by CEMM product contacts
  - Total level of FTE involvement in WTI is ~10.3
- Specialized CEMM Capabilities that Support WTI
  - Aquatic Facility
  - Microbial Research Facilities-molecular methods, cell culture lab
  - Aerosol Chamber for microbial exposure
  - Non-Targeted Analysis using High Resolution Mass Spectrometry
  - Tools for modeling extreme events



# CEMM Contributions to SSWR/Water Treatment and Infrastructure

RA7: Drinking Water and Distribution Systems	<ul style="list-style-type: none"><li>▪ Molecular detection of drinking water opportunistic pathogens such as <i>Legionella</i>, and evaluation of disinfection efficacy using the opportunistic pathogens</li><li>▪ Use of sensor technology to monitor inorganic contaminants (e.g., bromide and iodide) in drinking water systems that contribute to disinfection by-products</li><li>▪ Animal dose-response assessment from inhalation of aerosols containing <i>Legionella pneumophila</i></li><li>▪ Detection of emerging viral pathogens in drinking water systems</li></ul>
RA8: PFAS	<ul style="list-style-type: none"><li>▪ Development of non-targeted analysis-based approaches to detect PFAS chemicals</li></ul>
RA9: Wastewater and Water Reuse	<ul style="list-style-type: none"><li>▪ Development and standardization of Whole Effluent Toxicity Methods</li><li>▪ Development of methods for detecting SARS-CoV-2 in wastewater</li><li>▪ Understanding microbial contaminant removal capabilities of resource recovery water technologies and wastewater treatment plants for water reuse efforts</li><li>▪ Evaluation of air conditioner condensate as a source for reuse water by testing for contaminants</li></ul>
RA10: Integrated Stormwater Management	<ul style="list-style-type: none"><li>▪ Generation of stormwater monitoring data sets for selected microbial contaminants from a range of urban locations, including inland and coastal waters.</li><li>▪ Updates and application of the Watershed Management Optimization Support Tool (WMOST) for watershed management, including stormwater</li><li>▪ Modeling stormwater microbial quality to inform onsite reuse and enhanced aquifer recharge</li><li>▪ Using downscaled climate data to develop intensity-duration-frequency (IDF) curves to explore potential changes to extreme precipitation under future scenarios</li><li>▪ Comparison of design, performance, and maintenance of groundwater spreading basins and drywells for stormwater infiltration and aquifer recharge in the semi-arid Southwest</li></ul>
RA11: Tech Support	<ul style="list-style-type: none"><li>▪ Technical guidance as needed</li></ul>



## Contact Information

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