

Public Meeting for Contract 23RD017

Scientific Evaluation of Nitrogenous Emissions from Soils

Subject Matter Expert Review Panel (SMERP) on Nitrogenous Emissions

May 7, 2024

SMERP Members

- Dr. William Horwath, UC Davis
- Dr. Whendee Silver, UC Berkeley
- Dr. Xia Zhu, University of Wisconsin-Madison
- Dr. Martin Burger, Expert in Soil Nitrogen Emissions
- Dr. Viney Aneja, North Carolina State University



Scope of Work

Evaluate the current state of the science on nitrogenous (i.e., reactive nitrogen compounds) emissions from soils in California by providing quantitative evidence and comprehensive justifications that support the responses and conclusions set out by the committee, which will also answer specific questions posed in the Tasks of this contract (examples provided in latter slides).

This work will emphasize on emissions of air pollutants like oxides of nitrogen (NO_x), ammonia (NH_3), and nitrous oxide (N_2O) in agricultural regions where nitrogen fertilizers and organics are applied.

Task 1: Coordinate with the SMERP Members and Moderate Bi-Monthly Meetings

- SMERP members will coordinate to address specific questions on nitrogenous emissions from California's soils, as posed in Task 2.
- SMERP members will objectively and critically provide detailed and comprehensive answers that leverage their knowledge and other existing scientific materials.
- SMERP members will synthesize all the responses and seek consensus during bi-monthly meetings.
- SMERP members will synthesize all the information that derived from this contract into a comprehensive report.

Task 2: Conduct a comprehensive review of nitrogenous emissions from soils

APPROACH: Review of scientific literature, pertinent databases, and emission estimation methodologies

- What scientific data sources are there on nitrogenous emissions from soils (e.g., NO_x , NH_3 , N_2O)? Review of past and current literature.
- Classify scientific data sources in a database that clearly describes the spatial (e.g., San Joaquin Valley, Imperial Valley) and the temporal (e.g., seasonal, annual, daily) relevance to California, including agronomic production practices.
- Describe driving variables (e.g., activity data, application method, nitrogen content, soil moisture, temperature, etc.) for nitrogenous emissions from soils.

Task 2: Conduct a comprehensive review of nitrogenous emissions from soils (cont.)

- Assess the importance of nitrogenous emissions in comparison to literature studies.
- Assess the uncertainty of modeling of nitrogenous emissions.
- Inform CARB of study synthesis on ways to refine CARB's emission inventory.
- Identify any knowledge gaps that could be addressed through additional research and field studies to ensure that future research efforts are effective and informative.

Deliverables

- Final Report and virtual or in-person seminar
- The Final Report will include content from the Draft Final Report that has been refined based on the comments provided throughout the process.
- Peer-reviewed publications, if any, will be publicly available.