

USDA Agricultural Research Service
National Program 211
Water Availability & Watershed Management
External Panel Retrospective Review: 2016-2020

Prepared by:

Anthony O'Geen

University of California, Davis

Anita Thompson

University of Wisconsin-Madison

George Vellidis

University of Georgia

Mary Leigh Wolfe (chair)

Virginia Tech

Hailin Zhang

Oklahoma State University

August 21, 2020

Executive Summary

National Program 211 Water Availability and Watershed Management

The mission of the Water Availability and Watershed Management National Program is “to effectively and safely manage water resources to sustain and increase agricultural production and water use efficiency while protecting the environment and human and animal health.” To achieve its mission, the National Program is organized into four components:

- 1) Effective Water Management in Agriculture
- 2) Erosion, Sedimentation, and Water Quality Protection
- 3) Enhancing and Documenting the Benefits of Conservation Practices
- 4) Watershed Management to Improve Ecosystem Services in Agricultural Landscapes

The research plan for each component is presented in terms of four to six problem statements. In this retrospective assessment, the research completed for each problem statement was evaluated based on Accomplishment Report 2016-2020 with respect to four factors. The evaluation results are summarized as follows for each factor:

- Achievement of Action Plan

The Action Plan was achieved, or mostly achieved, for 9 of the 19 problem statements, partially achieved for 5, and largely not achieved for 5. We observed several instances where accomplishments were misplaced with respect to problem statements. This might have been the case for some of the partially and largely not achieved plans; although, the Accomplishment Report notes “... that a few Research Needs may not have associated accomplishments. The primary reasons for this can be attributed to a loss of funding or scientific staff, or a redirection of the resources necessary to address another urgent problem facing agriculture - in this national program or in related ones.” No specific information was provided as to which research needs or problem statements experienced a loss of resources so we were unable to take that into account in our review.

A significant amount of the research conducted in NP 211 addresses more than one problem statement. The Retrospective Report does not include any synthesis across problem statements or across components. Such synthesis would likely show greater impact and identify additional opportunities for collaboration across ARS units, as well as identify gaps in the research.

- Relevance to highest priority problems as stated in the Action Plan

The research reported for 12 of the problem statements was highly relevant to the priority problems stated in the Action Plan. The research was mostly relevant for 1

problem statement, moderately or partially relevant for 4 statements, and low for 2 statements.

- Quality as measured by generation of new knowledge and innovation and development of cutting-edge methods and technologies

Overall, the quality of research was judged to be high. This was based largely on the record of publication of refereed articles in a range of journals, including high impact journals. Evaluation of quality was clearer with respect to some problem statements than others. Complete details of publications, patents, licensing, software downloads, and other indicators of quality were not presented for each problem statement, making it difficult in some cases to judge quality.

- Production of outcomes with meaningful impact

The outcomes reported for 11 of the statements were judged to be high impact. Those for 7 of the statements were judged to be moderate and impact for 2 of the statements, low to moderate. The impact of some outcomes/products will be greater over time. Similar to the evaluation of quality, evidence provided about impact was much clearer for some problem statements than for others. For example, stakeholder testimonials were provided for some outcomes/products.

During the first three years, FY2017 through FY2019, of the current planning cycle, 133 full-time scientists working at 25 locations across the United States engaged in 32 ARS-led and 285 cooperative research projects to conduct research as part of NP 211. During those first three years, ARS researchers published 942 refereed journal articles, as reported in the Annual Reports for those years. From 2016-2020, NP 211 ARS scientists were granted a total of 5 patents and participated in a combined total of 19 Cooperative Research and Development Agreements (CRADAs), Material Transfer Agreements (MTAs), and Material Transfer Research Agreements (MTRAs). This is a strong level of productivity. In addition, the level of collaboration was strong. The ARS researchers collaborated with scientists at universities, government agencies, and industry inside and outside the United States, including over 400 research collaborations in 51 other countries. Such collaboration is essential for development and implementation of research results. From 2016-2020, NP 211 scientists were awarded 172 grants and funding awards from industry (52), international organizations (5), USDA (30) and other federal agencies (26), state agencies (7), and universities (52). The FY2019 Annual Report also noted that 185 students and postdoctoral research associates were training with ARS, an important contribution to the future of the research enterprise within and outside of ARS.

Overall, the research conducted through the Water Availability and Watershed Management National Program is relatively high impact. Many of the accomplishments are of high quality, relevance, and impact. The impact of some of the outcomes will be realized in a longer timeframe.