Fiscal Year 2021
Panel Outcome Report
Soil & Air (NP212)

TODD WARD Digitally signed by TODD WARD
Date: 2022.02.14 13:23:41
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Todd Ward, Ph.D. Scientific Quality Review Officer
(January 2020-December 2021)

Date

MARQUEA KING Digitally signed by MARQUEA KING
Date: 2022.02.14 14:59:04 -05'00'

Marquea D. King, Ph.D., Director/Program Coordinator

Date

Panel Outcome Report FY 2021
Soil & Air (NP212)

This Panel Outcome Report is a summary of the Soil & Air, National Program (212) Office of Scientific Quality Review (OSQR) Project Plan Peer Review (PPPR) process held from June – September 2021.

The project plans reviewed by these panels were applicable to the mission of National Program (212) Soil & Air, to improve the quality of atmosphere and soil resources affected by, and having an effect on agriculture, and to understand the effects of, and prepare agriculture for, adaptation to climate change.

This panel outcome report is intended to inform the Office of National Programs (ONP) and each Area of research (research scientist or SY) progress as it relates to the NP212. Data tables display outcomes of scoring by Areas, Panels, and overall program.

Selected chairs (Table 1) were in part, recommended by National Program Leaders (NPLs) from NP212 and/or previous OSQR service; others were sought based on their nationally recognized expertise by the OSQR Director. They were examined for suitability to lead a panel review, screened for conflicts of interest (COI) and finally concurred upon by the current Scientific Quality Review Officer (SQRO), Dr. Todd Ward.

Table 1. Panels reviewed for the Soil & Air, National Program (212)

Panel	Panel Chair	Panel Meeting (Re-Review)	Number of Panelists	Number of Projects
Panel 1. Manure, Greenhouse Gas, Ammonia, Emissions, Beef & Swine	Claudia Wagner-Riddle	6/17/2021	4	3
Panel 2. Dairy, Manure, Crop Systems, Soil Nutrient Cycling	Kristen Johnson	9/16/2021	5	4
Panel 3. Poultry, Manure, Precision Ag Systems	Rajiv Khosla	9/9/2021	6	5
Panel 4. Soil Health, Microbiome, Soil Processes, Rotations	David Burton	9/13/2021	5	5
Panel 5. Cropping Systems, AMR, Biostimulants, Fate and Transport	Charles Wesley Wood	6/14/2021	4	3

Review Process

Following panel review for each plan, OSQR Director, with SQRO concurrence, sends each Area Director a panel consensus recommendation document. This may include recommendations for revision of the plan to which researchers are required to respond in writing and, as appropriate, revise their written plans in accordance with guidelines as detailed in the OSQR Handbook (see www.ars.usda.gov/osqr).

In addition, as part of the panel deliberation, a scoring of the overall quality of the plan is judged based on the degree of revision the panel deems is required. This scoring is termed an "Action Class." Each reviewer is asked to anonymously provide an Action Class rating for each plan. OSQR assigns a *numerical equivalent* to each Action Class rating and then averages these to arrive at an overall Action Class score for the plan.

Action Class is defined as follows:

No Revision Required. An excellent plan; no revision is required, but minor changes to the project plan may be suggested.[1]

Minor Revision Required. The project plan is feasible as written, requires only minor clarification or revision to increase quality to a higher level.

[1] While a No Revision Action Class would imply that change to the plan is not required, where the panel requests specific additions to the plan, if accepted, should be incorporated into the updated plan.

Moderate Revision Required. The project plan is basically feasible but requires changes or revision to the work on one or more objectives, perhaps involving alterations of the experimental approaches in order to increase quality to a higher level and may need some rewriting for greater clarity.

Passed Review:

For plans receiving one of the above three Action Class scores (No Revision, Minor Revision, or Moderate Revision), scientists are required to respond, in writing, to address all panel comments in the consensus recommendation document; revise their project plan as appropriate; and submit the revised plan and responses to the OSQR through their Area Office. Both the updated plan and the recommendations' form are reviewed by the SQRO and, once they are satisfied that all review concerns have been satisfactorily addressed, the project plan is certified, the Area Office is notified, and the project plan may be implemented.

Certification:

Certification is contingent upon making a good faith effort to satisfactorily address panel comments and recommendations. A plan has not "passed" the OSQR PPPR process until the SQRO's certification is delivered to the Area.

Major Revision Required. There are significant flaws in the experimental design and/or approach or lack of clarity which hampers understanding. Significant revision is needed.

Not Feasible. The project plan, as presented, has major scientific or technical flaws. Deficiencies exist in experimental design, methods, presentation, or expertise which make it unlikely to succeed.

Failed Review:

For plans receiving an Action Class score of Major Revision or Not Feasible, scientists are required to address, in writing, all panel comments in the consensus recommendation document; revise their project plan as appropriate; and submit the revised plan and responses to the OSQR through their Area Office. The plan *MUST* then undergo a Re-Review by the initial deliberating panel, at which time a second set of consensus recommendations and second Action Class score are obtained.

Per the Re-Review, if the plan receives an Action Class score of a No Revision, Minor Revision, or Moderate Revision, the project plan may be implemented after following the **Passed Review** section above. Plans receiving a second Major Revision, or Not Feasible score are considered failed reviews. The Action Class and Consensus Recommendations from the Re-Review are provided to the Area with NO further option for revision or review on that particular project plan as it has been submitted.

Such plans may be terminated, reassigned, or restructured at the discretion of the Area Office and ONP. For plans receiving Major Revision, it may be elected not to further revise them and to end review with the plan not receiving certification (plan fails review). For those receiving a score of Not Feasible, Area and National Program Leader (NPL) approval are needed for the plan to be revised for re-review. Otherwise, the plan will be considered to have failed review. Subsequent action with regard to the research and researchers is left to Area and ONP-NPL leadership.

At the conclusion of each PPPR deliberation, the chair and panel reviewers are asked to provide general statements or recommendations on the overall process as well as the general quality of the plans which underwent review. The Chair is specifically asked to provide a Panel Chair Statement which they feel focuses on the overall conduct of the review or any broad areas with regard to the research they feel would benefit future researchers or the Agency as a whole. Copies of such statements for (NP212) can be found following this report.

Review Outcomes

Reviews can vary, but ultimately, depends on a combination of the panelists selected and the scientific writing capabilities of the team who wrote the project plan. The OSQR is responsible for assuring that each panel contains subject matter experts who provide knowledgeable, clear, rigorous, and fair assessments. Therefore, PPPR panels vary in their overall outcomes.

Uniquely, the ability of an ARS research team to respond to panel recommendations/comments in order to *revise and improve project plans is, perhaps, the greatest strength of the ARS PPPR process.*

ARS uses the National Program Panel Outcome Report as a measure of scientific progress and as a demonstration of overall program quality, how well researchers understand and address the needs of the expert panel reviewers. Initial review scores that are moderate or higher are recorded as such and will not be certified as having completed the PPPR until the SQRO has deemed that all reviewer concerns have been satisfactorily addressed. For lower scores/failed reviews, the panel provides a re-review score, which is considered along with the initial review score.

Table 2.
Initial and Re-review Scores for Soil & Air, National Program (212)

Panel	No revision	Minor	Moderate	Major	Not Feasible	Re-Review
Panel 1. Manure, Greenhouse Gas, Ammonia, Emissions, Beef & Swine	0	0	3	0	0	0
Panel 2. Dairy, Manure, Crop Systems, Soil Nutrient Cycling	1	1	2	0	0	0
Panel 3. Poultry, Manure, Precision Ag Systems	0	4	1	0	0	0
Panel 4. Soil Heath, Microbiome, Soil Processes, Rotations	0	3	2	0	0	0
Panel 5. Cropping Systems, AMR, Biostimulants, Fate and Transport	0	2	1	0	0	0

Table 3.
Area Scores for Soil & Air, National Program (212)

Area	No revision	Minor	Moderate	Major	Not Feasible
NEA	0	3	0	0	0
MWA	0	3	3	0	0
PA	0	2	3	0	0
PWA	1	0	2	0	0
SEA	0	2	1	0	0

Table 4.
Overall Scores for Soil & Air, National Program (212)

	No revision	Minor	Moderate	Major	Not Feasible
# Plans with each score	1	10	9	0	0

Overall Panel Characteristics:

Panel Characteristics

The OSQR PPPR relies heavily on expert panel member selection by the OSQR Director and SQRO selected Panel Chairs. ARS scientists, research leaders, and ONP are encouraged to recommend panelists they understand to be free of any COIs. While the selected/seated Panel Chair is under no obligation to use Agency recommended panelists, the SQRO must review and approve the Chair's panelist selections and may ask for substitutions or provide additional experts for consideration.

Factors and qualifications considered in PPPR panel selection (chair and panelist) such as being a qualified expert overall in the field being reviewed, research tenure, publication record, award history, geographic location, overall diversity, and availability to participate fully in the process, all play an integral role in who is invited to serve an ARS/OSQR PPPR panel. Many of the reviews are composed with a balance of nationally and internationally recognized experts. Tables 5-6 display various characteristics of the panel composition; all affiliations were accurate at the time of the panel review.

Affiliations

Peer reviewers are affiliated with several types of institutions, primarily those in academia, but also special interest groups and industry. In some cases, peer reviewers have recently retired but are still active as consultants, scientific editorial board members, and members of professional societies.

Table 5.
Panelist Faculty Rank and Affiliations for Soil & Air, National Program (212)

Panel	Professor	Associate Professor	Assistant Professor	Government (Agency)	Industry & Industry Organizations
Panel 1. Manure, Greenhouse Gas, Ammonia, Emissions, Beef & Swine	2	1	1		
Panel 2. Dairy, Manure, Crop Systems, Soil Nutrient Cycling	3		1		1 Extension Specialist
Panel 3. Poultry, Manure, Precision Ag Systems	4		2		
Panel 4. Soil Heath, Microbiome, Soil Processes, Rotations	3		1		1 Research Scientist
Panel 5. Cropping Systems, AMR, Biostimulants, Fate and Transport	2	1			1 Agronomist

Research Impact and Ethnicity/Gender

The OSQR PPPR process is lauded as a rigorous and objective ARS function striving for the highest possible scientific credibility. In general, panelists shall hold a doctoral degree unless the discipline in

question is one which does not subscribe to a doctorate level education to achieve the highest recognition and qualification (e.g., engineers and modeling specialists). Panelists are also judged by their most recent professional accomplishments (e.g., awards and publications completed in the last five years). Finally, the panelists who are currently performing or leading research to address a problem similar to those being researched in the National Program under review are preferred.

Table 6. Panel Additional Information Soil & Air, National Program (212)

Panel	H-Index Average	Gender	Geographic Locations
Panel 1. Manure, Greenhouse Gas, Ammonia, Emissions, Beef & Swine	24	2 Females 1 Male	2 Canada 1 Plains 1 Denmark
Panel 2. Dairy, Manure, Crop Systems, Soil Nutrient Cycling	16	3 Females 2 Males	3 PWA 1 MWA 1 SEA
Panel 3. Poultry, Manure, Precision Ag Systems	18	3 Females 3 Males	1 NEA 3 Plains 2 SEA
Panel 4. Soil Heath, Microbiome, Soil Processes, Rotations	31	1 Female 4 Males	4 Canada 1 SEA
Panel 5. Cropping Systems, AMR, Biostimulants, Fate and Transport	23	1 Female 3 Males	2 SEA 1 Plains 1 PWA

List of Panel Chairs

Panel 1 **Claudia Wagner-Riddle** Professor University of Guelph **Education:** Ph.D. University of Guelph	**Panel 2** **Kristin Johnson** Professor Washington State University **Education:** Ph.D. Michigan State University	**Panel 3** **Rajiv Khosla** Professor Kansas State University **Education:** Ph.D. Virginia Tech	**Panel 4** **David Burton** Professor Dalhousie University **Education:** Ph.D. University of Alberta
Panel 5 **Charles Wesley Wood** Professor University of Florida **Education:** Ph.D. Colorado State University			

NP212 Soil & Air, National Program Panel Chair Statements

Panel Chair responsibilities include providing the OSQR with a statement that describes their overall panel experience, how the panel was conducted, and general quality of the plans reviewed. It does not lend itself to discussing details of specific research project plan reviews nor attribution to individual panelists. Panel Chairs are given a format to follow for writing their statements, however, are free to discuss what they believe is important for broader audiences.

UNIVERSITY of GUELPH
ONTARIO AGRICULTURAL COLLEGE
SCHOOL OF ENVIRONMENTAL SCIENCES

June 24, 2021.

Todd Ward, Ph.D.
Scientific Quality Review Officer
Office of Scientific Quality Review
Agricultural Research Service, USDA
5601 Sunnyside Avenue, MS 5142
Beltsville, MD 20705

Re: Panel Chair Statement for NP 212 Panel 1 (Manure, greenhouse gas, ammonia, emissions, beef and swine)

Dear Dr. Todd Ward:

I recently chaired panel 1 for NP 212 and would like to provide my statement about the overall review process. I was fortunate to be able to identify three respected reviewers, who brought their expertise and also a diversity of viewpoints to the process. Reviewers were well-prepared for the panel discussion and provide insightful comments and suggestions for the research plans. The panel had no difficulty in arriving at a consensus on the feedback provided for each plan and the voting procedure revealed close agreement between recommendations from reviewers. I found the assistance of staff from the ARS Office of Scientific Quality quite timely and helpful, including the orientation sessions, which clearly defined the panel's role in the review process.

In terms of feedback on the process, panel members provided the following comments:

- In future reviews it would be helpful to see the response by applicants to feedback provided;
- the timing of the review was a bit tricky given that in coincided with the beginning of field season (suggestion is to have it earlier or later in year);
- responses to emails and queries were timely and helpful but it seemed that at times repeated emails were received (hard to keep track).

Overall, all panel members were appreciative of the very organized and clear process. On a personal note, this made my role as chair much easier.

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With respect to feedback on how researchers might improve plans, I suggest a somewhat greater emphasis on the study's justification and novelty of the proposed plans. Due to the nature of the 'pre-determined' objectives, the plans in general had less of a focus on presenting an argument for the studies than traditional proposals; this is understandable, given the difference between proposed plans and regular research proposals. However, it would help reviewers to better assess the value of the proposed plans if the work is placed in the context of previous outcomes and how the proposed plans build on the research conducted to date.

Overall, chairing this review panel was a positive experience and I thank you for inviting me to serve in this position. If additional information is needed from me, please do not hesitate to contact me.

Sincerely,

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Dr. Claudia Wagner-Riddle, Professor
Fellow, American Meteorological Society
Fellow, Soil Science Society of America

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WASHINGTON STATE UNIVERSITY

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October 15, 2021

Todd Ward, Ph.D.
Scientific Quality Review Officer
Office of Scientific Quality Review
Agricultural Research Service, USDA
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Beltsville, MD, 20705

Dear Dr. Ward:

The review panel for NP 212, Dairy, manure, crop systems, and soil nutrient cycling, met on Tuesday October 4, 2021 to review four ARS proposals. Unfortunately, this was the second date for this panel because several reviewers failed to meet the deadline for the first meeting that would allow the staff time to have the needed compilations.

Reviewers: Seating the panel was relatively difficult because it appears that a large population of soil scientists are retiring. The list provided to me had excellent people on it but many were honored to be asked and then declined so a much broader search was conducted. Additionally, much of the work on manure, soils and microbial transmission is done by ARS scientists or the ARS scientists are actively collaborating with them. Nonetheless, the panel that was seated had the expertise needed to evaluate the proposals and desire to assist ARS.

Review process: The training the panel received was excellent and the reviews met the required criteria. I believe the training modules are valuable because many panelists have reviewed grants previously and the ARS process is different enough that the panelists need guidance. The panel review process (during the meeting) went smoothly and the discussion was robust and appropriate to make certain the ARS scientific teams received high quality reviews to consider to improve the projects. All reviewers had read all proposals and contributed to the discussion. I think there would have been even more discussion from those reviewers who did not do the prepared reviews if we were not on a zoom call. The expertise in the review panel fit the science described. It was valuable to have Dr. King and the Scientific Quality Review Officer at the panel meeting to clarify critical questions that allowed the panel discussion to move forward. The panel did not have and comments nor specific suggestions about the process.

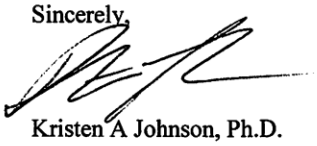
Plans. The plans were well prepared and it was clear thought and effort had gone into the work and the design of the work. Much of the research proposed is unique and critically needed for the sustainability of US agriculture. The teams were excellent and the attention to the translation of the work to real-life producers was appreciated by the panel. One area of confusion was how the plans dealt with the ARS Objectives into which the plans were to fit. These broad objectives allow ARS as an entity to focus its work but become confusing to reviewers who are trying to get to specific objectives of a proposal. The breadth of the ARS objective is not always the specific objective from the plan. One thought would be to change the verbiage so the ARS objective is the goal and the proposals have objectives they seek to

design an experiment for. This was an area where it was helpful for Dr. King in the room. One additional place that ARS might assist in the plan creation would be to encourage strong statistical design and analysis sections. This was a common area where the panel felt needed more attention. This is also an increasing comment on reviews of NIFA and other grant proposals.

ARS staff. Of particular note is the excellence of the staff in this process. Dr. Marquea King was a terrific resource and assisted the panel in training and the process. Without Ms. J. Linda Daly-Lucas the panel would have ceased to function. Her patience knows no bounds. These people should be commended for their excellence and if they are ever nominated for any staff awards it would be my pleasure to write a letter in support of their efforts.

Thank you for the opportunity to lead this panel. I learned a tremendous amount about the cutting-edge research that is occurring in the ARS system and enjoyed meeting some new people across the US through their panel service. Should you require additional information, I am happy to provide it to you.

Sincerely,



Kristen A Johnson, Ph.D.
Professor and Scientist

February 6, 2022

Todd Ward, Ph.D.
Scientific Quality Review Officer
Office of Scientific Quality Review
Agricultural Research Service, USDA
5601 Sunnyside Avenue, MS 5142
Beltsville, MD 20705

Re: USDA: NP 212 Panel 3: Poultry, manure, precision ag systems Panel Chair Statement

Dear Dr. Ward:

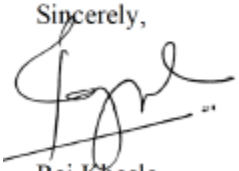
Greetings from Kansas State University. I recently chaired and successfully completed the request from Office of Scientific and Quality review (OSQR) process for USDA: NP 212 Panel 3: Poultry, manure, precision ag systems.

I am pleased to share with you that the entire process was completed with great ease and sincerity of all panel members. We had a total of five proposals for which we recruited five independent reviewers plus the chair, a team of six panelists. Apart from the long process to successfully recruit reviewers, the entire process was flaw-less and conducted professionally. The panelist met online on Thursday September 9, 2021 for a period of 3hrs, however our actual meeting lasted longer than that. This was my third time I was involved in the OSQR process and first time as Chair. I am quite impressed with the due diligence of the process to maintain the scientific acumen and sanctity of our national research laboratories.

Specifically, I would report that the reviewers and their preparation for discussions were excellent; their written reviews were detailed, thoughtful and are directed to science and not to the team; the overall process was fair and scientific. Based on this experience, I do not have any recommendations for enhancements for the process.

Thanking you for extending this opportunity and please let me know should you need additional information at this time.

Sincerely,



Raj Khosla

Professor of Precision Agriculture & Department Head
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2012 Jefferson Science Fellow, National Academy of Sciences, Engineering, and Medicine
Founder & Past President, International Society of Precision Agriculture

DALHOUSIE UNIVERSITY

January 19, 2022

Todd Ward, Ph.D.
Scientific Quality Review Officer
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5601 Sunnyside Avenue, MS 5142
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Dear Dr. Ward,

I served as the Panel Chair for NP 212 Panel 4. Soil Health, Microbiome, Soil Processes, Rotations (2021) in the USDA, ARS 212 Natural Resources and Sustainable Agricultural Systems (NRSAS), Soil and Air National Program. I offer the following as my report on the panel's deliberations.

After considerable effort, a panel of five reviewers (the Chair plus four others) were identified. This was by far the most challenging aspect of the review process. Of the fifteen scientists invited only four agreed, most of these were professional contacts provided by the Chair. The pre-screened list provided by the USDA resulted in few acceptances most noting they were not in a discipline appropriate to the subject area of the panel or that they had retired. The identification of individuals willing to serve significantly delayed the selection of the review panel, initiated on April 15, 2021, to July 25, 2021 with the Chair agreeing to act as one of the reviewers.

Panel considered five projects. Each project was assigned a primary and secondary reviewer who completed written reports relating to their assigned projects which were circulated to participants prior to the discussion of the project plans. All panel members were encouraged to review all of the projects and participate in the discussion and voting on each project. The comments from the primary and secondary reviewers were considered to be of high quality and provided evidence of careful consideration of each project.

On September 13, 2021, a virtual meeting of the review team was convened. All panelists were in attendance during the meeting and participated in the discussion and voting. Each project was reviewed in a structured manner. Each project was introduced by the primary reviewer, with additional comments by the secondary reviewer and Chair. The primary reviewer followed by secondary reviewer went through each the objectives, focusing on the strengths questions/recommendations of significance. Each project was concluded with a discussion of the probability of success, merit, and significance. Consideration of each project was concluded with voting by all panel members. The results of the voting were considered by the panel and a consensus recommendation made. It was also evident from the discussion that many of the panelists had carefully reviewed the projects not assigned to them as they participated meaningfully in the discussion of the project and suggested revisions/considerations. The OSQR staff recorded the comments and suggestions provided by the reviewers and conducting the voting on each project.

All five projects received effective and constructive reviews during the review process. I feel the assembled panel had the necessary skills to evaluate these proposals. The only significant issue with the panel review process was the difficulty in finding panelists willing to perform reviews. The OSQR office would be well advised to revisit how panelists are to be selected and the renumeration they receive. If the intent is to recruit top scientists to perform this time consuming task the renumeration should better reflect the amount of effort involved and might increase the chances of success in recruiting panelists.

Sincerely,

David L. Burton, Ph.D., P.Ag., FCSSS
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18 June 2021

Todd Ward, Ph.D.
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Dr. Ward,

It was my pleasure to serve as the chair for the NP212 Panel 5 - Cropping Systems, AMR, Biostimulants, Fate and Transport (2021) Panel. Here I'll provide my overall thoughts and assessment of the review process and the panel.

It's my belief that a high-quality review was conducted with regard to the reviewers and their preparation for discussions, their written reviews, and recommendations for enhancements. The reviewers were highly qualified to assess our assigned projects and I'm convinced their suggestions to the PIs will be useful in strengthening the reviewed projects. The projects we reviewed were well-written and will require minor to moderate revision for improvement. It is hoped that the PIs will find the suggestions useful and that they can incorporate them in their project plans.

It's also my belief that the review process, as laid out by ARS personnel, was excellent and ensured that the panel was able to conduct a high-quality review. The Scientific Quality Review staff provided more than adequate training for me and the panel members. The staff were great in providing the logistical support from the start of the process (bringing me on as panel chair), through the middle of the process (panel onboarding and training), to the end of the process (the review panel meeting). I don't know how the process could have gone any better. I commend the staff for their efforts towards providing support required to have a successful project review panel.

I thank you for including me in the ARS Scientific Quality Review process. My experience on this review was very satisfying and I'm glad to have been able to help in improvement of the important research conducted by the USDA-ARS. Please don't hesitate to contact me should you require anything else related to this review.

Sincerely,

C. Wesley Wood
Professor and Director

The Foundation for The Gator Nation