

Report NP106 – May 2015

NP 106 Aquaculture Panel Report



Michael A. Grusak, Scientific Quality Review Officer
(January 2014-December 2015)

August 5, 2015
Date



Michael S. Strauss, Peer Review Program Coordinator

August 4, 2015
Date

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Introduction

This Panel Report is an overview and analysis of the 2014 National Program (NP) 106 Aquaculture Panel Review. The project plans reviewed by these panels were applicable to the mission of the National Program to “*conduct high quality, relevant, fundamental, and applied aquaculture research, to improve the systems for raising domesticated aquaculture species, and to transfer technology to enhance the productivity and efficiency of U.S. producers and the quality of seafood and other aquatic animal products.*”

Candidates to chair each panel were recommended by the National Program Leader (NPL), Dr. Jeffrey Silverstein, vetted by the Office of Scientific Quality Review (OSQR). Dr. Michael A. Grusak, Scientific Quality Review Officer (SQRO), approved a Chair for four of the six panels. Panels 5 and 6 consisted of a single plan for which written reviews were solicited and a composite review was prepared under Dr. Grusak’s guidance (Table 1).

Table 1. Aquaculture Panels with the date of the initial review meeting where all plans before the panel were discussed and rated, the number of panelists appointed to the panel, and the number of projects reviewed by each panel.

Panel	Panel Chair	Panel Meeting Date	Number of Panelists	Number of Projects Reviewed
Panel 1: Production Systems	Dr. James H. Tidwell, Professor & Chair, Division of Aquaculture, Kentucky State University, Frankfort, KY	September 30, 2014	3	3
Panel 2: Production, Genetics	Dr. Steven B. Roberts, Assistant Professor, School of Aquatic & Fishery Sciences, University of Washington, Seattle, WA	September 17, 2014	3	3
Panel 3: Genetics, Feed, & Production	Dr. Steven G. Hughes, Director & Associate Professor, Aquatic Research & Education Center, Cheyney University of Pennsylvania, Cheyney, PA	December 15, 2014	3	3
Panel 4: Health	Dr. Jill B. Rolland, Center Director, U.S. Department of the Interior, U.S. Geological Survey, North West Region, Seattle, WA	October 6, 2014	5	5
Panel 5: Product Quality Development	Dr. Michael A. Grusak, SQRO	N/A	4	1
Panel 6: Ecology and Habitat Utilization	Dr. Michael A. Grusak, SQRO	N/A	4	1

Panel Review Results

Following panel review, OSQR sends each Area Director a document that contains the consensus recommendations for each plan from their Area. 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 addition, as part of their discussion, panelists provide a judgment of the overall quality of the plan, expressed in terms of the degree of revision that may be required. This judgment is termed an “Action Class.” Each reviewer is asked to 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.

The Action Classes and their Numerical Equivalent are defined below.

Average Score 7.0-8.0	No Revision Required (Numerical Equivalent: 8). An excellent plan; no revision is required, but minor changes to the project plan may be suggested.
Average Score 5.1-6.9	Minor Revision Required (Numerical Equivalent: 6). The project plan is feasible as written, requires only minor clarification or revision to increase quality to a higher level.
Average Score 3.1-5.0	Moderate Revision Required (Numerical Equivalent: 4). The project plan is basically feasible, but requires changes or revision to the work on one or more objectives, perhaps involving alteration of the experimental approaches in order to increase quality to a higher level and may need some rewriting for greater clarity.
Average Score 1.1-3.0	Major Revision Required (Numerical Equivalent: 2). There are significant flaws in the experimental design and/or approach or lack of clarity which hampers understanding. Significant revision is needed.
Average Score 0-1.0	Not Feasible (Numerical Equivalent: 0). The project plan, as presented, has major scientific or technical flaws. Deficiencies exist in experimental design, methods, presentation, or expertises which make it unlikely to succeed.

For plans receiving one of the first three Action Classes (No Revision, Minor Revision, or Moderate Revision) scientists respond in writing to panel comments in the consensus recommendation document, revise their project plan as appropriate, and submit the revised plan and responses to OSQR through their Area Office. These are reviewed by the SQRO and, once he/she is satisfied that all review concerns have been satisfactorily addressed, the project plan is certified and may be implemented. *Certification is not guaranteed, but is contingent upon satisfactorily addressing panel comments and recommendations.* Plans have not “passed” review until receiving the Officer’s certification.

When the Action Class is Major Revision or Not Feasible, responses and revised plans are provided as above, but must then be re-reviewed by the panel, which provides a second set of Consensus Recommendations and Action Class. If the re-review Action Class is No Revision, Minor Revision or Moderate Revision the project plan may be implemented after receipt of a satisfactory response and Officer certification as described above. Plans receiving Major

Revision or Not Feasible scores at this point fail review (The Action Class and consensus comments are provided to the Area but there is no further option for revision). Such plans are terminated, reassigned, or restructured at the discretion of the Area and Office of National Programs. On occasion, it is elected not to further revise plans that have received a low score on initial review. In such cases these are treated as having not successfully completed (i.e., failed) review, they cannot be certified, and appropriate action becomes the responsibility of the NPL and Area leadership.

NP 106 Program Overview

At the end of each panel meeting, the reviewers are asked to provide general comments or recommendations on the process. In addition, Panel Chairs provide a written statement on the review process and research plans. Below is a summary of those comments for the NP 106 review.

The panelists were impressed with the interactions and range of research activities and research collaborations in ARS programs. They felt that the Aquaculture program in ARS is leveraging resources and collaborations to overcome space/research constraints, which shows good creativity in this regard.

In the current review cycle for the Aquaculture review, one plan failed initial review but passed on re-review (Table 2). Table 3 shows the proportion of initial and final scores for all three cycles of the Aquaculture review. The first cycle had the highest average initial score (5.59; Minor) followed by the third cycle (5.45; Minor) and lastly the second cycle (4.57; Moderate). In the final review, the first cycle again had the highest average final score (5.83; Minor), followed by the third cycle (5.69; Minor) and second cycle (4.67; Moderate).

Figure 1 shows that the size of the panel does not have an influence on the initial review score. Similar to Figure 1, Figure 2 includes the data for all the plans reviewed in the current third cycle and again shows that the size of the panel does not have an influence on the initial review score.

Figure 3 shows there is no influence of overall scientific effort (scientific year, SY) on initial review for the plans in the current NP 106 Aquaculture Panel Review. Figure 4 confirms this observation by including all the data for the current review cycle.

There was no apparent influence of actual number of scientists on the initial review score for the current NP 106 Aquaculture Panel Review (Figure 5) and Figure 6 provides similar data.

Figure 7 compares the initial review scores for the first, second and third cycles of the NP 106 Aquaculture Panels. The second cycle had the higher number of plans receiving a major revision score (3) compared to the first (1) and third (1) cycles. In the final review, the second cycle also had two plans that failed review (Figure 8).

Table 2. Proportion of initial and final scores for the third (2014) cycle expressed as percentage of all reviewed and the average initial numerical score for the NP 106 Aquaculture Panels. Note that for plans receiving No Revision, Minor Revision, or Moderate Revision, a second score is not received from the Panel so the initial score is recorded as the final score. Number of projects in parentheses.

Third Cycle, 2014	Initial Review						Final Review					
	No Revision	Minor Revision	Moderate Revision	Major Revision	Not Feasible	Avg Initial Score	No Revision	Minor Revision	Moderate Revision	Major Revision	Not Feasible	Avg Final Score
Panel 1: Production Systems (3)	0.0%	33.3%	66.7%	0.0%	0.0%	5.11	0.0%	33.3%	66.7%	0.0%	0.0%	5.11
Panel 2: Production, Genetics (3)	0.0%	66.7%	33.3%	0.0%	0.0%	5.83	0.0%	66.7%	33.3%	0.0%	0.0%	5.83
Panel 3: Genetics, Feed & Production (3)	33.3%	0.0%	66.7%	0.0%	0.0%	5.78	33.3%	0.0%	66.7%	0.0%	0.0%	5.78
Panel 4: Health (5)	0.0%	60.0%	20.0%	20.0%	0.0%	5.31	0.0%	80.0%	20.0%	0.0%	0.0%	6.07
Panel 5: Product Quality Development (1)	0.0%	100.0%	0.0%	0.0%	0.0%	6.5	0.0%	100.0%	0.0%	0.0%	0.0%	6.5
Panel 6: Ecology & Habitat Utilization (1)	0.0%	0.0%	100.0%	0.0%	0.0%	4	0.0%	100.0%	0.0%	0.0%	0.0%	4
NP 106, All	5.6%	43.3%	47.8%	3.3%	0.0%	5.45	5.6%	63.3%	31.1%	0.0%	0.0%	5.69

Table 3. Proportion of initial and final scores for all cycles expressed as percentage of all reviewed and the average initial numerical score for the NP 106 Aquaculture Panels. See note above regarding No, Minor, and Moderate initial scores. Number of projects in parentheses.

	Initial Review						Final Review					
	No Revision	Minor Revision	Moderate Revision	Major Revision	Not Feasible	Avg Initial Score	No Revision	Minor Revision	Moderate Revision	Major Revision	Not Feasible	Avg Final Score
First Cycle (25)	12.0%	56.0%	28.0%	4.0%	0.0%	5.59	16.0%	56.0%	28.0%	0.0%	0.0%	5.83
Second Cycle (24)	4.3%	33.3%	50.0%	12.5%	0.0%	4.57	4.2%	33.3%	54.2%	8.3%	0.0%	4.67
Third Cycle (16)	6.3%	43.8%	43.8%	6.3%	0.0%	5.45	6.3%	50.0%	43.8%	0.0%	0.0%	5.69

Figure 1. Influence of the number of reviewers (Panel Size) on the averaged numerical outcome (Score) received on the first review for the 16 plans in the current NP 106 Aquaculture review.

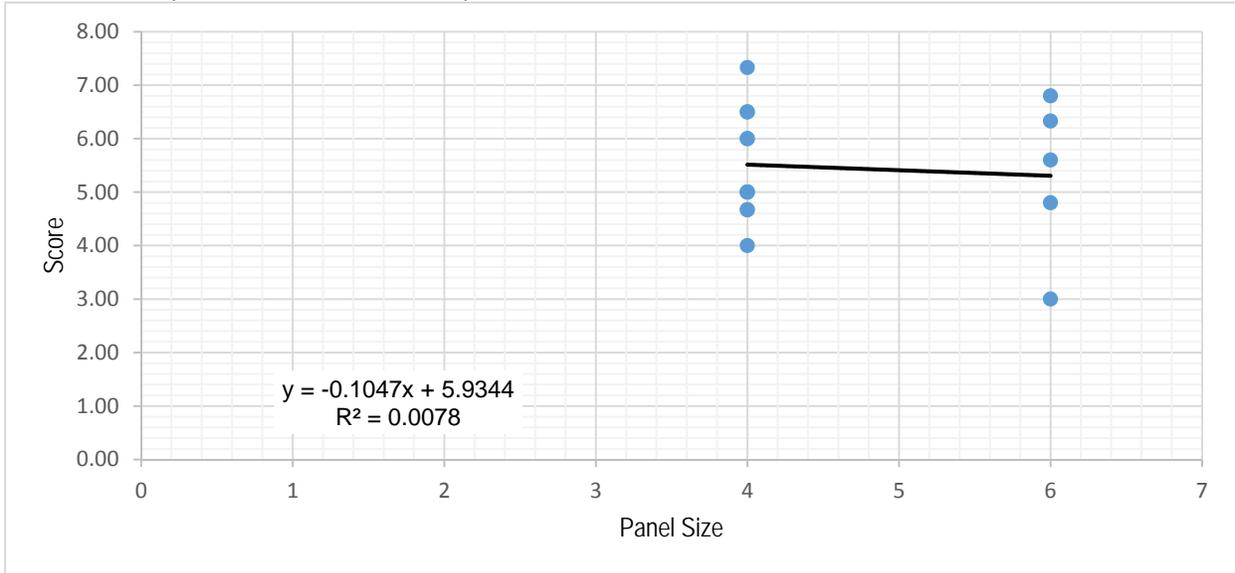


Figure 2. Similar to Figure 1 but data for all plans reviewed by panels in the current review cycle, with individual reviewer scores plotted in the figure.

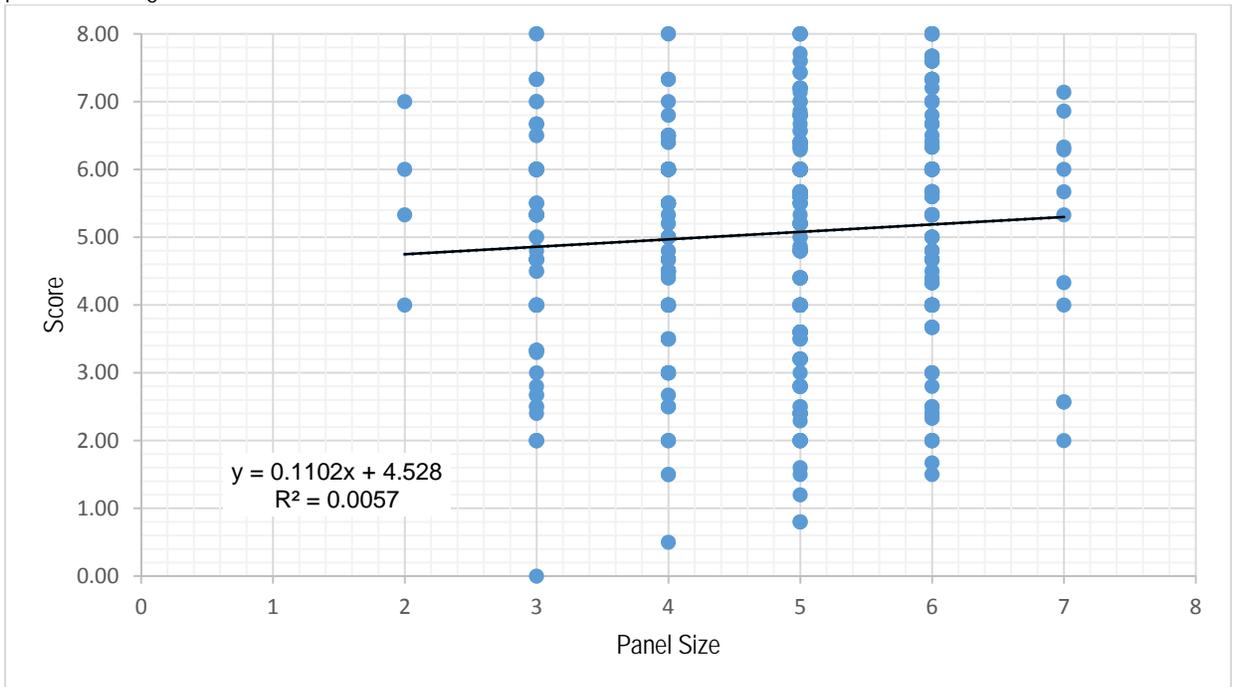


Figure 3. Influence of the Scientific Time (SY) on the averaged numerical outcome (score) received on the first review of the 16 plans in the current NP 106 Aquaculture review.

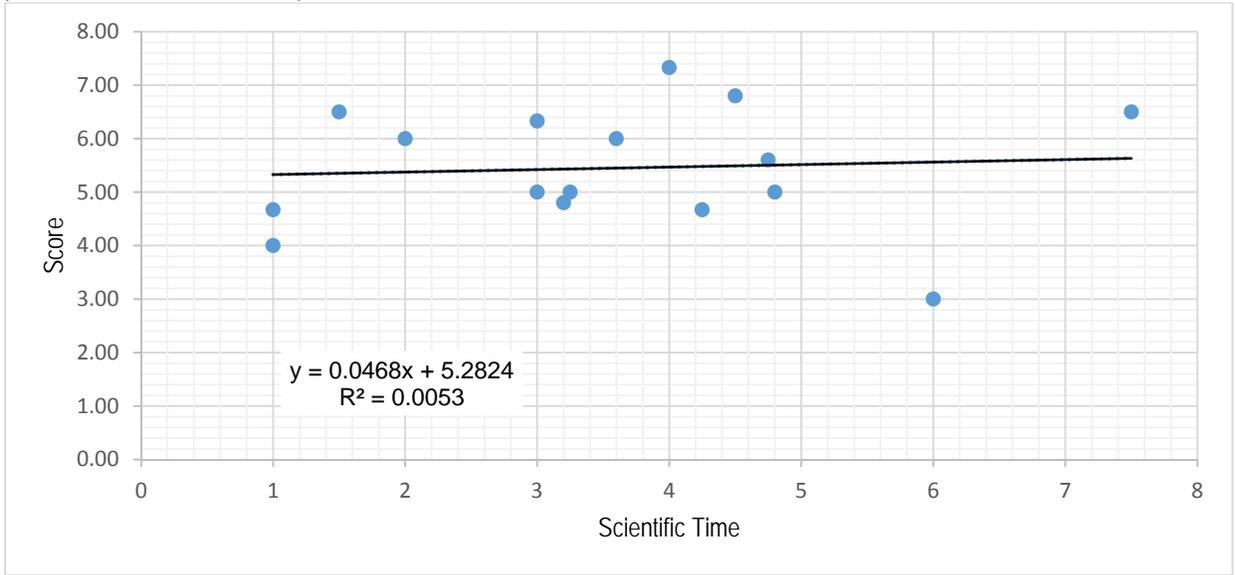


Figure 4. Similar to Figure 3 but for all plans reviewed in the current review cycle.

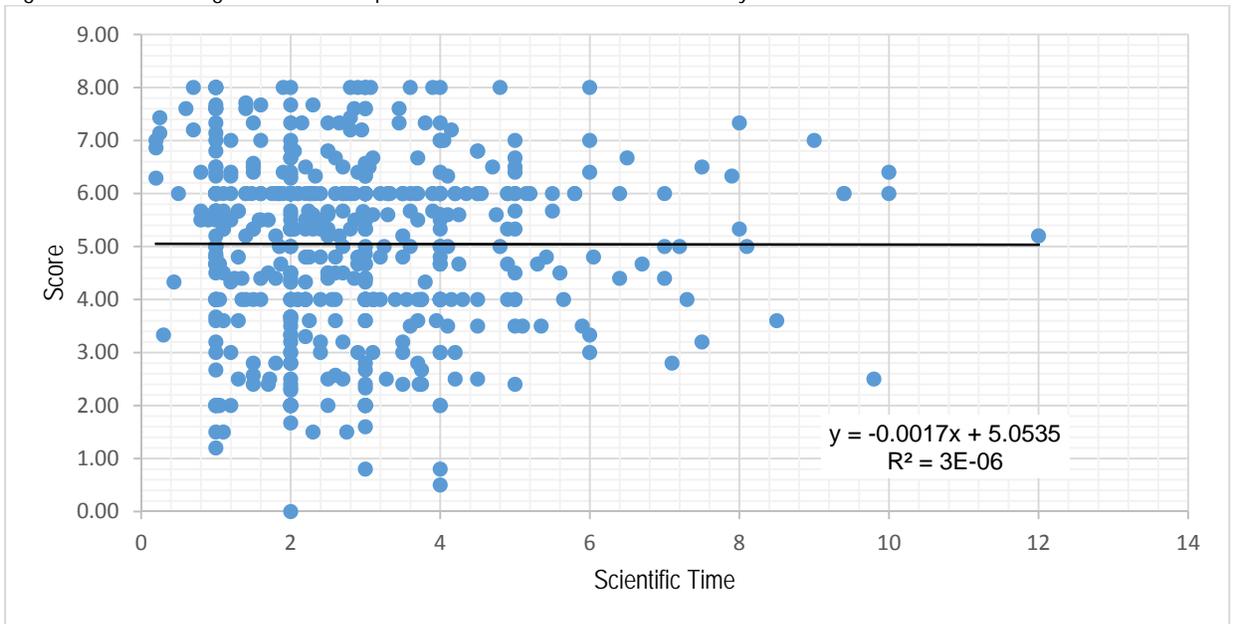


Figure 5. Influence of the actual number of scientists on a plan on the averaged numerical outcome (Score) received in the current cycle of the NP 106 Aquaculture review.

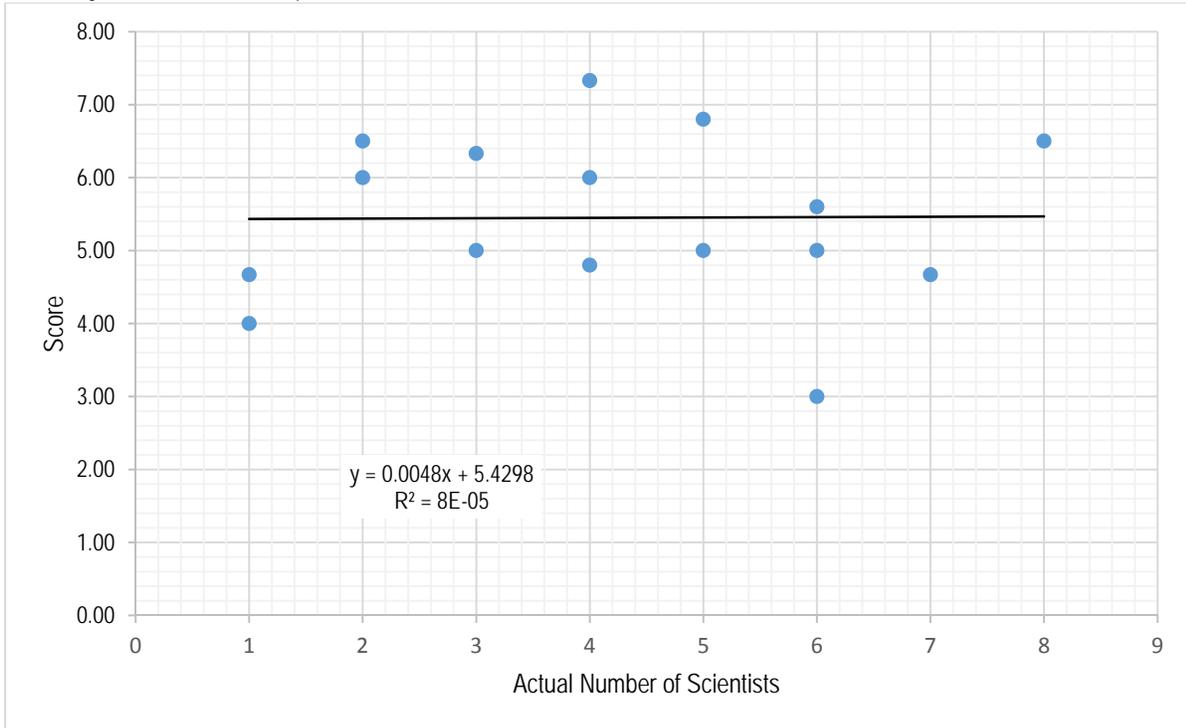


Figure 6. Similar to Figure 5 but for all plans in the current review cycle.

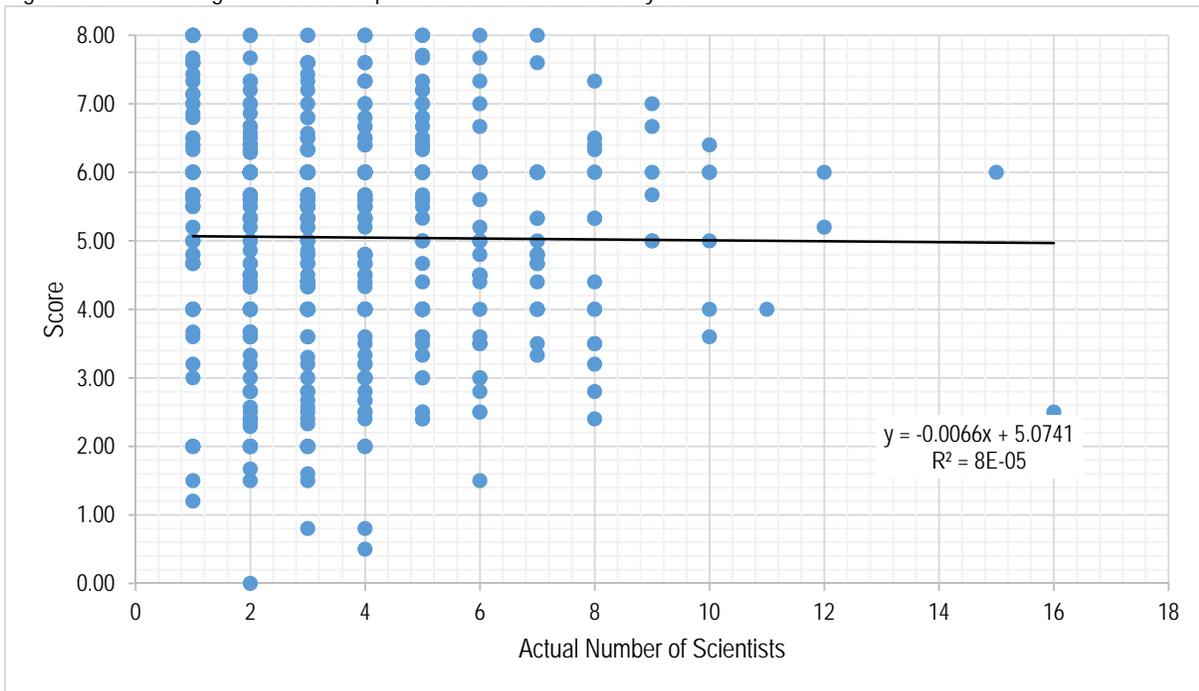


Figure 7. Percentage distribution of initial review scores for the first (2004), second (2009) and third (2014) cycles for the NP 106 Aquaculture Panels (5.59; 4.57; 5.45, average composite scores, respectively). The number of plans reviewed by each cycle is in parentheses. Number over columns is the number of plans receiving that score.

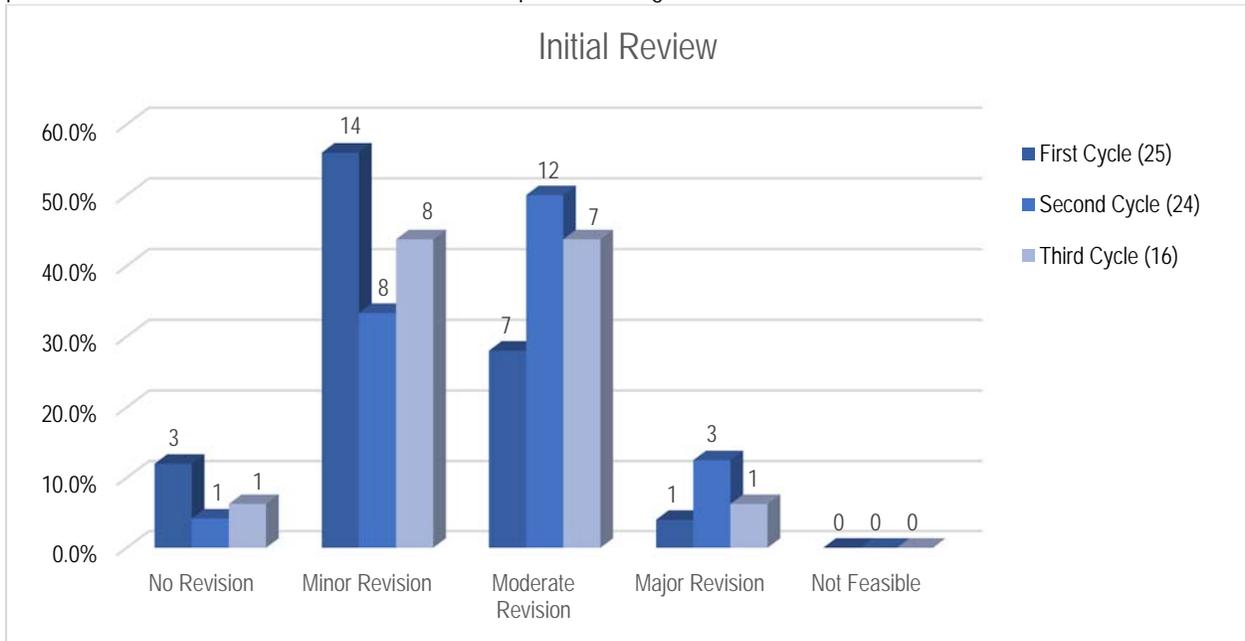
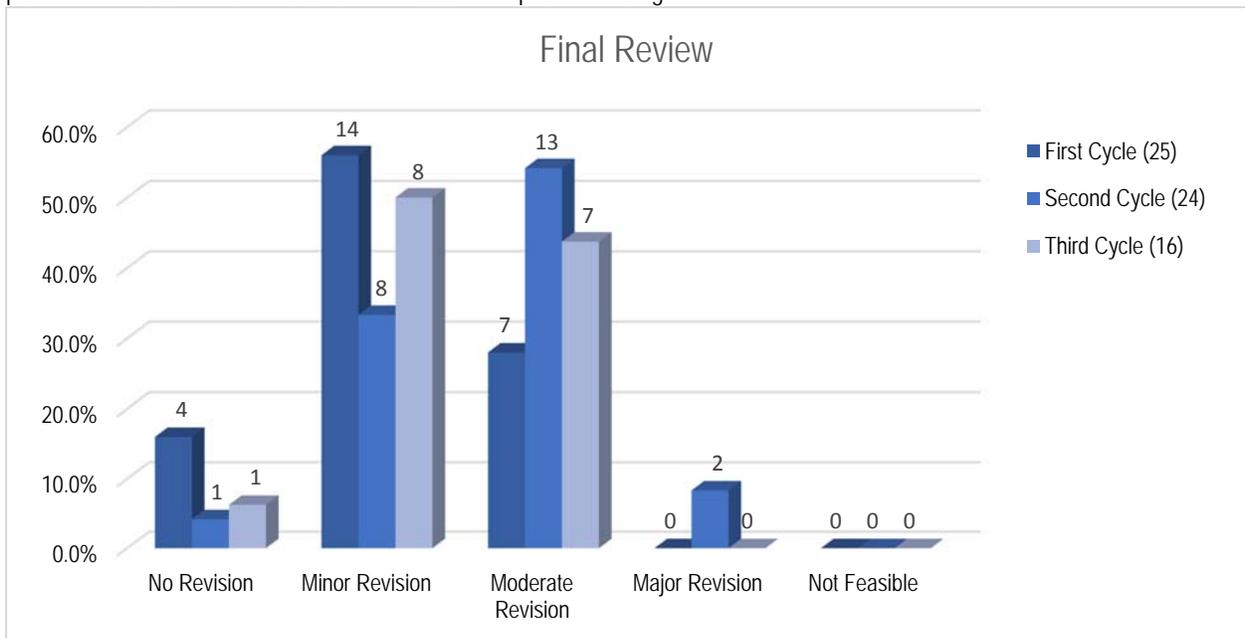


Figure 8. Percentage distribution of final review scores for the first (2004), second (2009) and third (2014) cycles for the NP 106 Aquaculture Panels (5.83; 4.67; 5.69, average composite scores, respectively). The number of plans reviewed by each cycle is in parentheses. Number over columns is the number of plans receiving that score.



Panel Characteristics

ARS places responsibility for panel member selection primarily on external and independent Panel Chairs. ARS scientists, managers and the Office of National Programs may recommend panelists but the Panel Chair is under no obligation to use these recommendations. However, the SQRO does review and approve the Panel Chair’s panel member selections and may ask for alterations or additions. Several factors such as qualifications, diversity, and availability play a role in who is selected for an ARS peer review panel. The six panels were composed of nationally and internationally recognized experts to review 16 projects primarily coded to the Aquaculture Program (see Table 1, page 2). The information and charts below provide key characteristics of the Aquaculture Panels. This information should be read in conjunction with the Panel Chair Statements.

Affiliations

Peer reviewers are affiliated with several types of institutions, especially universities, but also special interest groups and industry. In some cases, peer reviewers have recently retired but are active as consultants, scientific editorial board members, and are members of professional societies. Table 4 shows the faculty rank of panelists affiliated with universities and the type of institutions with which the Aquaculture panel members were affiliated at the time of review.

Table 4. Faculty Rank of Panelists Affiliated with Universities and Other Affiliations Represented on the Panels. Number of panelists in parentheses.

Panel	Professor	Associate Professor	Assistant Professor	Government	Industry & Industry Organizations	Other
Panel 1: Production Systems (4)	4					
Panel 2: Production, Genetics (4)	1		1	1	1	
Panel 3: Genetics, Feed, and Production (4)						
Panel 4: Health (6)	4			2		
Panel 5: Product Quality Development (4)	2	1	1			
Panel 6: Ecology and Habitat Utilization (4)	2		1		1	

Accomplishments

The peer review process is intended to be rigorous and objective, striving for the highest possible scientific credibility. In general, panelists are expected to hold a PhD unless the norm for their discipline tends to not require 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 addressed in the National Program are preferred. Table 5 describes their characteristics in the Aquaculture Panels.

Table 5. The Panels' Recent Accomplishments. Number of panelists in parentheses.

Panel	Published Articles Recently	Received Recent Professional Awards	Having Review Experience	Currently Performing Research
Panel 1: Production Systems (4)	4	4	4	4
Panel 2: Production, Genetics (4)	4	3	4	4
Panel 3: Genetics, Feed, and Production (4)	4	1	4	4
Panel 4: Health (6)	6	6	6	5
Panel 5: Product Quality Development (4)	4	4	4	4
Panel 6: Ecology and Habitat Utilization (4)	4	3	4	4

Current and Previous ARS Employment

The Research Title of the 1995 Farm Bill, 105-585, mandated ARS's requirements for the peer review of ARS research projects, such that: 1) panel peer reviews of each research project were mandated at least every five years and 2) the majority of peer reviewers must be external (non-ARS) scientists. Table 6 shows that none of the peer reviewers were currently or formerly employed by ARS.

Table 6. Affiliations with ARS. Number of panelists in parentheses.

Panel	Currently Employed by ARS	Formerly Employed by ARS
Panel 1: Production Systems (4)	0	0
Panel 2: Production, Genetics (4)	0	0
Panel 3: Genetics, Feed, and Production (4)	0	0
Panel 4: Health (6)	0	0
Panel 5: Product Quality Development (4)	0	0
Panel 6: Ecology and Habitat Utilization (4)	0	0

Aquaculture Panel Chairs



James H. Tidwell, Ph.D.

Panel 1: Production Systems (2014)

Professor and Chair, Division of Aquaculture, Kentucky State University, Frankfort, Kentucky

Education: B.S. University of Alabama; M.S. Samford University; Ph.D. Mississippi State University

Dr. Tidwell's research interests are aquaculture, alternative production systems, alternative species and feeds.



Steven B. Roberts, Ph.D.

Panel 2: Production Genetics (2014)

Assistant Professor, School of Aquatic and Fishery Sciences, University of Washington, Seattle, Washington

Education: B.S. North Carolina State University; Ph.D. University of Notre Dame

Dr. Roberts' research interests include genomics and physiology.



Steven G. Hughes, Ph.D.

Panel 3: Genetics, Feed and Production (2014)

Director and Associate Professor, Aquatic Research & Education Center, Cheyney University of Pennsylvania, Cheyney, Pennsylvania

Education: B.S. University of Notre Dame; M.S. & Ph.D. Cornell University

Dr. Hughes research interests include fish physiology, fish nutrition, recirculating aquaculture systems and fish feeding behavior.



Jill B. Rolland, Ph.D.

Panel 4: Health (2014)

Center Director, U.S. Department of the Interior, U.S. Geological Survey, Northwest Region, Seattle, Washington

Education: B.S. University of Washington; M.S. & Ph.D. University of Bergen, Norway

Dr. Rolland's research interests are aquatic ecology and animal health.

Panel Chair Statements

All Panel Chairs are requested to turn in a statement that describes how their Panel was conducted and to possibly provide comments on the review process that might not otherwise be found in the individual research project plan reviews. Panel Chairs are given some guidelines for writing their statements, but are nevertheless free to discuss what they believe is important for broad audiences.



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**DIVISION OF AQUACULTURE
& LAND GRANT PROGRAM**
KSU's Program of Distinction

November 26, 2014

Dr. Michael A. Grusak, Scientific Quality Review Officer
Office of Scientific Quality Review
Agricultural Research Service, USDA
5601 Sunnyside Avenue, MS 5142
Beltsville, MD 20705

Dear Dr. Grusak,

Thank you for the opportunity to serve as Chair for ARS' National Program 106 Panel 1: Production Systems (2014). I believe we had a very qualified group of panelists. The discussions by the group were at times detailed, but were also constructive in tone.

A number of suggestions were made with the intent of improving the ARS scientist's protocols and outcomes. I think one overarching conclusion was that it is very advantageous to have ARS, and ARS scientists, with the ability to address practical applied research questions using near commercial scale systems (such as large split-pond facilities). This allows important questions to be asked and answered that most universities simply do not have resources to address.

I feel that the discussion process was efficient and effective. We had a logistical issue due to a reviewer being on sabbatical in Thailand. However, the reviewer provided written comments which allowed his input to still be captured and incorporated.

At this time I do not have any suggestions on how to improve the process. I do feel that this was an effective review panel

Again, thank you for the opportunity.

Sincerely,

James H. Tidwell, PhD
Professor/Chair



Inspiring Innovation.

Growing Leaders.

Advancing Kentucky.

Kentucky State University is an equal educational and employment opportunity/affirmative action institution.



Dr. Steven B. Roberts
Associate Professor

UNIVERSITY OF WASHINGTON

January 21, 2015

Dr. Michael A. Grusak, Scientific Quality Review Officer
Office of Scientific Quality Review
Agricultural Research Service, USDA
5601 Sunnyside Avenue, MS 5142
Beltsville, MD 20705

Dear Dr. Grusak,

I am writing to provide feedback with respect to my serving as panel chair for USDA NP 106 Panel 2: Production, Genetics. I was generally impressed by the process and the sound and credible review provided by the panel. There were several points made regarding excellence of proposed research as well as suggestions for alternative considerations that might improve planned efforts.

Some of the most notable characteristics of the discussion process were the level of preparation by the panel and the overall organization provided by the Office of Scientific Quality Review. The only area that I felt could have been improved upon was the time spent discussing each project. Particularly as in most cases there was general agreement, sometimes this went rather long.

Overall, I was very impressed with the process and hopefully we made a positive contribution to USDA-ARS research efforts.

Sincerely,

A handwritten signature in black ink that reads 'Steven Roberts'.

Steven Roberts



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Education Laboratory**
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July 9, 2015

Dr. Michael A. Grusak, Scientific Quality Review Officer
Office of Scientific Quality Review
Agricultural Research Service, USDA
5601 Sunnyside Avenue, MS 5142
Beltsville, MD 20705

Dear Dr. Grusak:

As the Chair for the USDA NP 106 Panel 3: Genetics, Feed and Production I would like to take a few words to reflect on our review process. I was honored to work with such a well qualified and well prepared group of reviewers. Their peer reviews were scientifically sound and the group discussions showed the thoughtfulness and the time that was spent on not only reading the proposals, but also generating constructive suggestions to improve the proposals.

One of the most notable points for me was how quickly the panel developed a sense of comradery and professional respect for the ideas and perspectives of each other. I felt that everyone had a good feeling for the length of time that needed to be devoted to each topic and that we adapted quite well to the teleconference environment. We were well prepared by you and your staff for the process and I feel that the overall process was efficient, fair, and thorough.

My only significant suggestion to improve this process would be that if a more standardized format for the proposals could be established, it might aid in the way the panel interprets the projects. The differing styles of each group made it difficult at times to judge the completeness of one proposal verses another. Despite this, the panel did well with their understanding of the review criteria and the application of that criteria to the scoring process. Though I have served on about a half dozen USDA review panels, I do not think I have ever had the pleasure of working with one that was so focused and efficient.

In conclusion, thank you for allowing me to be a part of this process and I hope that I will get the opportunity to work within the USDA eer review process again. If you need further clarification of points made in this letter, or if you have additional questions, please do not hesitate to contact me using the information above.

Yours Truly;

Steven G. Hughes, Ph.D.
Professor of Biology and Laboratory Director



United States Department of the Interior

U.S. GEOLOGICAL SURVEY
Western Fisheries Research Center
6505 NE 65th St.
Seattle, Washington 98115

January 29, 2015

To: Dr. Michael A. Grusak
Scientific Quality Review Officer
Office of Scientific Quality Review
Agricultural Research Service, USDA
5601 Sunnyside Avenue, MS 5142
Beltsville, MD 20705

From: Dr. Jill Rolland
Center Director, Western Fisheries Research Center
NP Panel 4: Health Chair

Subject: Panel 4: Health (2014)

The National Program Panel 4 consisted of six members of highly qualified fish health and aquaculture experts from Federal laboratories and from academia. The group has a breadth of research experience and is also a geographically dispersed group with experience working on a wide variety of aquatic species.

The group began its work reviewing the proposals in August of 2014 and each panel member provided in depth comments for their primary and secondary packages as well as comments to the other research proposal packages. The panel spent several hours discussing the merits of each package on our first call in October, including strengths and weaknesses. Although much of the discussion focused on research design and how the design may or may not achieve the overall research goal, I found it interesting that several of the panel members commented on the need to consider real world relevance and not just the value of research in the laboratory environment. Overall, the panel found the proposals to be of high quality and to be highly relevant to the aquaculture industries, both commercial and enhancement-type aquaculture.

The panel concluded its work in January 2015. I am pleased with the amount of effort each panel member put into reviewing the packages as well as the meaningful discussion and comments. I

believe each panel member contributed to making the research packages stronger and I hope the researchers feel the same.

Best Regards,

Dr. Jill Rolland

Projects Reviewed by the Aquaculture Panels (listed by Lead Scientist)

North Atlantic Area

Yniv Palti

Integrated Research Approaches for Improving Production Efficiency in Salmonids

Steven Summerfelt

Developing and Refining Technologies for Sustainable Fish Growth in Closed Containment Systems

Gregory Wiens

Integrated Research to Improve On-Farm Animal Health in Salmonid Aquaculture

William Wolters

Genetic Improvement of Marine Fish and Shellfish

Mid South Area

Peter Bechtel

Improving the Product Value of Catfish

Benjamin LaFrentz

Pathogen Characterization, Host Immune Response and Development of Strategies to Reduce Losses to Disease in Aquaculture

Brian Peterson

Health Management, Disease Prevention and Control Strategies in Catfish Aquaculture

Brian Peterson

Improving Catfish Health and Production Performance

Kevin Schrader

Development of Management Strategies to Mitigate Pre-Harvest Microbial-Derived Off-Flavors in Fish Grown in Aquaculture

Eugene “Les” Torrans

Evaluating Nutritional Requirements, Identifying Alternative Ingredients and Improving the Production Environment for Hybrid and Channel Catfish Production

Eugene “Les” Torrans

Water Quality and Production Systems to Enhance Production of Catfish

Geoffrey Waldbieser

Genetics, Breeding and Reproductive Physiology to Enhance Production of Catfish

Pacific West Area

Frederic Barrows

Integrating the Development of New Feed Ingredients and Functionality and Genetic Improvement to Enhance Sustainable Production of Rainbow Trout

Brett Dumbauld

Developing Methods to Improve Survival and Maximize Productivity and Sustainability of Pacific Shellfish Aquaculture

Southern Plains Area

Benjamin Beck

The Role of Mucosal Surfaces and Microflora in Immunity and Disease Prevention

Bartholomew Green

Developing Nutritional, Genetic and Management Strategies to Enhance Warmwater Finfish Production

Office of Scientific Quality Review

The Office of Scientific Quality Review manages and implements the ARS peer review system for research projects, including peer review policies, processes and procedures. OSQR centrally coordinates and conducts panel peer reviews for project plans with ARS' National Program every five years.

OSQR sets the schedule of National Program Review sessions. The OSQR Team is responsible for:

- Panel organization and composition (number of panels and the scientific disciplines needed)
- Distribution of project plans
- Reviewer instruction and panel orientation
- The distribution of review results in ARS
- Notification to panelists of the Agency response to review recommendations
- *Ad hoc* or re-review of the project plan

Contact

Send all questions or comments about this Report to:

Christina Woods, Program Analyst

USDA, ARS, OSQR

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