

International Symposium to be held in Idaho



International
Symposium on Fish
Nutrition and Feeding

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The 17th International Symposium on Fish Nutrition and Feeding, hosted by the University of Idaho's Aquaculture Research Institute, will be held June 5-10, 2016, at the Sun Valley Resort in Ketchum, Idaho. The symposium, a bi-annual event, is the only international scientific meeting devoted entirely to fish nutrition, with 450-500 researchers from around the world representing every significant fish nutrition research organization as well as the aquafeed industry attending. Given the fact that fish feeds account for >50% of the cost of farmed fish production and the need for the aquaculture industry to utilize alternative ingredients for fishmeal and fish oil to produce sustainable fish feeds, it is crucial for fish nutrition researchers to keep up-to-date on the latest scientific findings and to make their research available to the aquafeed industry. Scientific conferences are an important

venue for such information exchanges.

Originally, the concept for the symposium venues was to rotate between Europe, the Americas and Asia. In recent years the symposium was held in Australia (2014), Norway (2012), China (2010), Brazil (2008) and France (2006). It has been held only once before in the USA; in 1996 in College Station, Texas. Sponsoring the symposium is a large undertaking that requires substantial backing and infrastructure, generally only available from government organizations. Fortunately, the University of Idaho agreed to provide the behind the scenes support for the symposium, with the result that after 20 years, the symposium will be held in the USA. Having the symposium in Idaho is an excellent opportunity to showcase the Idaho aquaculture industry and the strong aquaculture program at the University of Idaho, not only to

Aquaculture Research Institute

The ARI newsletter will be produced semi-annually and available online in Adobe Acrobat format through www.uidaho.edu/aquaculture.

If you would like to be notified via email when the latest edition is available on our web page, please notify the editor at aqua@uidaho.edu.

We would be happy to include appropriate contributions from those of you working in the field. Feedback and suggestions on how to improve this newsletter would also be appreciated.

This issue of the newsletter highlights various projects being conducted on the Moscow campus, the Hagerman Fish Culture Experiment Station and includes various extension activities.

The Aquaculture Research Institute Newsletter provides information about aquaculture-related activities at the University of Idaho. It is intended to complement rather than duplicate the Idaho Aquaculture Association Newsletter, although some articles may overlap. Articles in this newsletter may be reproduced without permission, provided they are properly cited. Please feel free to submit comments or material you would like us to consider for publication to:

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constituents in the USA, but worldwide. Coupled with construction of a new ARI fish laboratory in Moscow to complement the Hagerman Fish Culture Experiment Station, the University of Idaho will be well positioned to attract domestic and international students to study the wide range of academic topics that constitute aquaculture.

Visiting Professor spends a month at the Hagerman Fish Culture Experiment Station



Dr. Hector Hernandez

Dr. Hector Hernandez is a professor from the National Autonomous University of Mexico which is located in Mexico City. He recently completed a four-week period as a visiting scholar with the Aquaculture Research Institute at the Hagerman Fish Culture Experiment Station. During this period, Dr. Hernandez engaged in a number of activities that contributed to ongoing research programs at the Institute, received training on methods of RNA extraction and analysis of expression gene levels and assisted in rainbow trout spawning. While it may seem surprising, Mexico has a rainbow trout aquaculture industry, centered high in the mountains surrounding Mexico City near the city of Toluca. Dr. Hernandez's research activities focus on this small but important aquaculture industry.

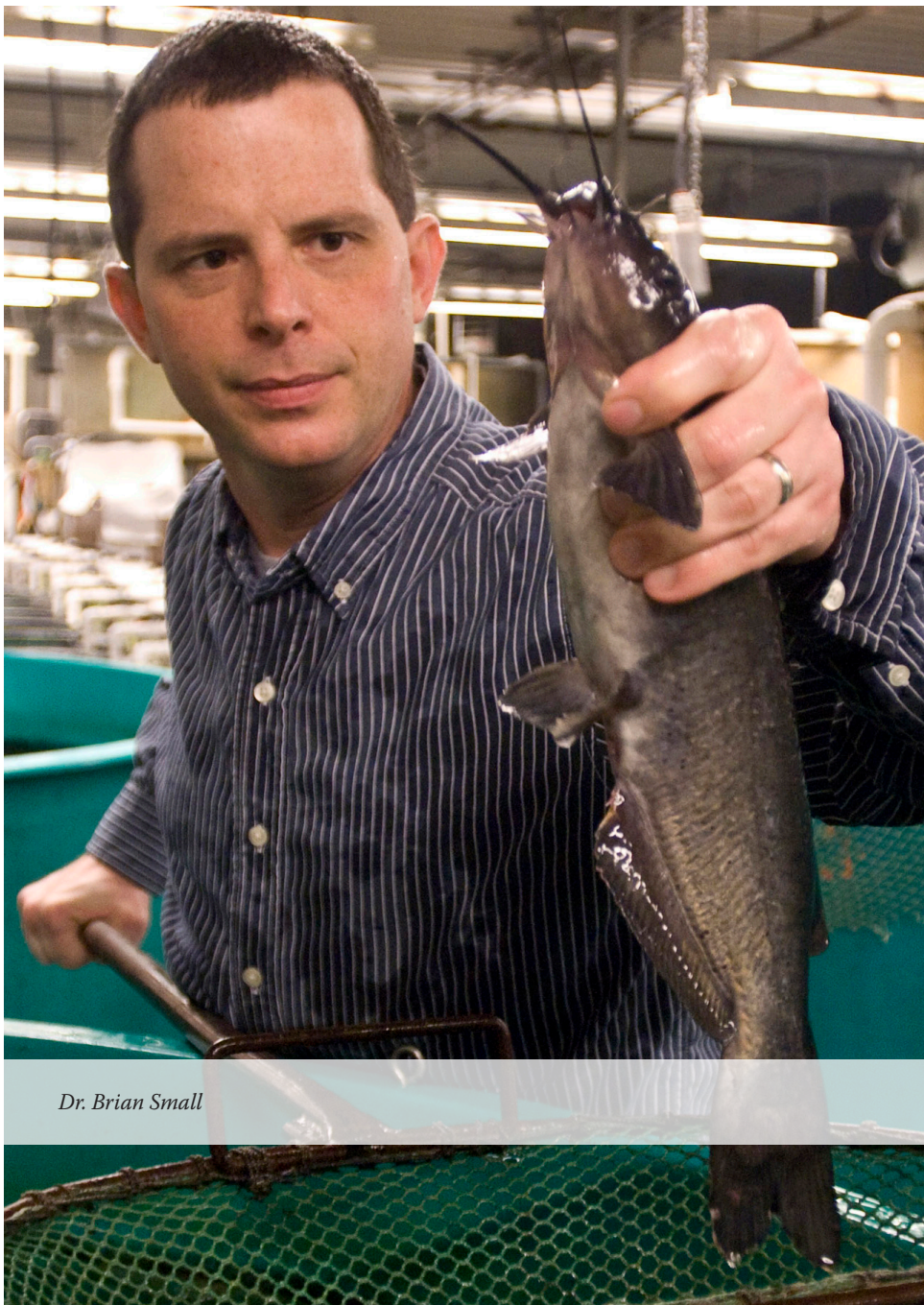
New Researcher coming to Idaho

The Aquaculture Research Institute is pleased to announce that Dr. Brian Small will join the team at the Hagerman Fish Culture Experiment Station in January 2016. Brian was most recently a professor at Southern Illinois University. Prior to joining Southern Illinois University, he was a research physiologist with the Agricultural Research Service, U.S. Department of Agriculture, for nine years stationed at the Catfish Genetics Research Unit

in Stoneville, Mississippi. Brian received his PhD in 1998 at the University of Maryland with an emphasis in fish nutrition, physiology and aquaculture.

Brian's research focus has been on striped bass, channel catfish and sturgeon, but that will change when he arrives in southern Idaho, the trout capital of the US. His expertise in fish physiology is a good fit for the strong fish nutrition and genetics programs at the Hagerman Station. Although his base will be in Hagerman, Brian will

be actively engaged with the College of Natural Resources where he will teach fish physiology, oversee graduate student research and develop research activities with faculty researchers. Brian has held a number of leadership positions in his career, including Interim Center Director of the ARS Center for Cool and Cold Water Aquaculture, Associate Dean in the College of Agricultural Sciences at Southern Illinois University and president of the Physiology Section of the American Fisheries Society. He has authored or co-authored over 80 scientific publications.



Dr. Brian Small

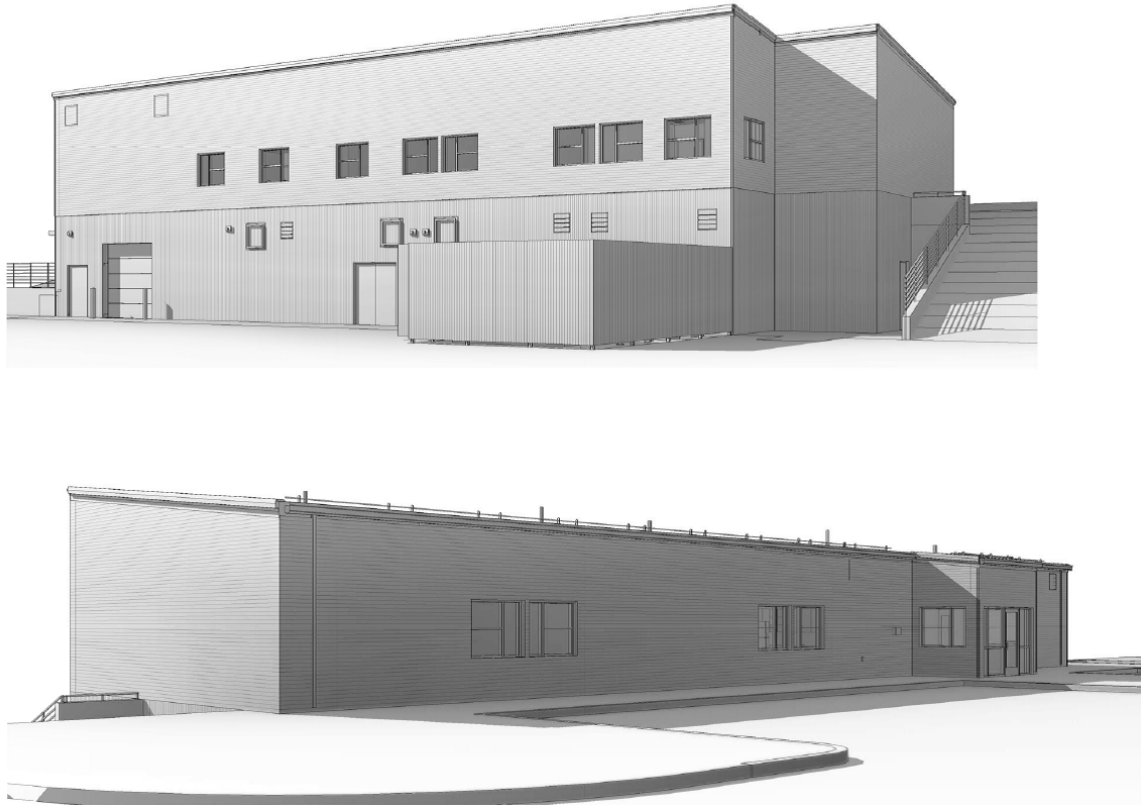
New Aquaculture Research Institute building approved

In August of 2015, the Idaho State Board of Education approved a request for approximately \$1.8M to construct a new Aquaculture Research Institute (ARI) facility that will replace critical functions of the aging ARI Poultry Hill facility on the University of Idaho (UI) campus. The goal is to increase efficiency and aquatic wet laboratory capacity between the College of Natural Resources (CNR), ARI campus, and ARI Hagerman facilities through better engagement of researchers and integration of facility capabilities across campus without duplicating fish/wet lab systems. This new facility will provide new research opportunities in aquaculture and fisheries sciences. Along with upgraded laboratory and office space, the

new facility will house a 4,000 ft² aquatic research wet laboratory, live feed room for rearing of larval fish species, seawater holding tanks to provide marine species research capacity, an analytical laboratory, a quarantine holding area, and bio-secure access. A wired conference room will more effectively link ARI Hagerman and ARI campus operations and promote enhanced distance education efforts. The new facility will continue to utilize recirculation system (RAS) technology for water conservation in the wet laboratory, but will have expanded functions to accommodate seawater RAS as well. All aquaculture systems will be modular and flexible to address research questions in all areas of freshwater aquaculture, but we will be well positioned to expand

research into areas associated with marine aquaculture development.

Ultimately, we strive to enhance the national and international reputation of Fisheries/Aquaculture research at the UI through realistic programmatic integration. We plan on linking ARI functions with Aquatic and Fisheries components of CNR, Biology, Animal and Vet Sciences, and other colleges and departments at UI. This will maximize research capabilities, increase training opportunities for graduate and undergraduate students seeking careers in Aquaculture and Fisheries sciences, and enhance opportunities for outreach. It is anticipated that the new facility will be operational by early 2017.



Conceptual view of new ARI facility showing a two story layout with faculty, staff, and student offices on top floor and laboratory facilities on the lower floor.

Aquaculture: A key component of food security and nutrition

By 2050, the world's population is expected to increase to 9 billion people. The challenge facing the world today is how to feed an additional 2 billion people within 35 years and to do it sustainably.

Currently, seafood from capture fisheries and aquaculture provides at least 15% of the average per capita intake of animal protein for more than 4.5 billion people. Because of its unique nutritional properties, seafood is also essential to the health of billions of people globally. Seafood, known as a high-quality protein, may be a more important contributor for human health and nutrition because of its lipid and micro-nutrient content.

Protein production from aquaculture is quite efficient. Fish

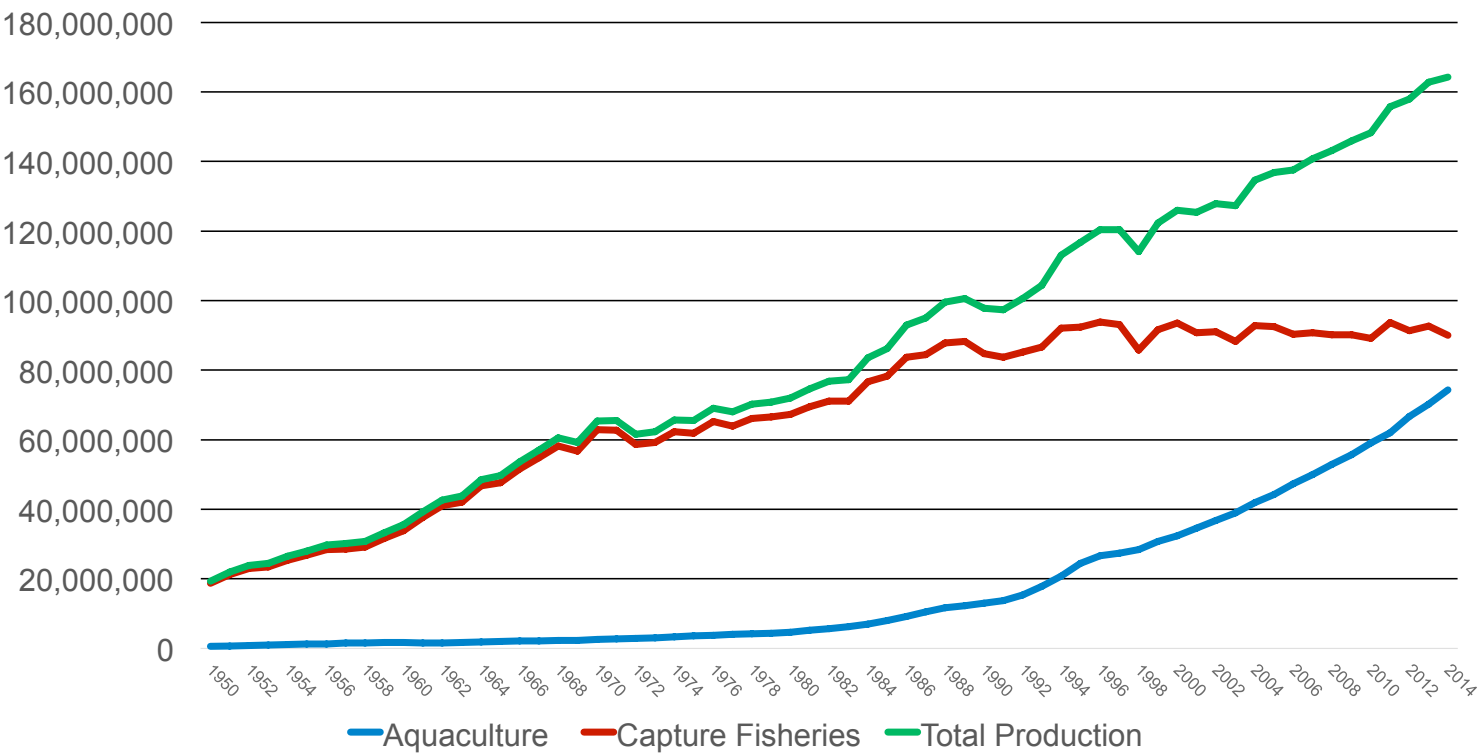
are efficient converters of feed into high-quality food and aquaculture products tend to have a much lower carbon footprint than animal production systems. Nitrogen and phosphorus emissions from aquaculture systems are much lower than those from pork and beef production systems and slightly higher than poultry production. However, molluscan shellfish farming systems absorb nitrogen and phosphorus emissions from other systems.

The global supply of fish from capture fisheries and aquaculture has grown by a factor of 8 since 1950 (Fig. 1). By comparison, global rice production increased by a factor of 3 after the Green Revolution. Over the last five decades the global supply of

seafood has increased at an annual average rate of 3.2%, outpacing world population growth at 1.6%. Although global aquaculture production has slowed in recent years (6.2% average annual rate between 2000 and 2012) from 10.8% between 1980 and 1990 and 9.5% between 1990 and 2000, aquaculture remains the fastest growing food production sector in the world. Higher aquaculture production has helped meet demand for seafood as landings from capture fisheries production have leveled off.

Capture fisheries and aquaculture are also sources of wealth. Employment in this sector has grown faster than the rate of growth of the world's population. Capture fisheries and aquaculture

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provide jobs to tens of millions and support the livelihoods of hundreds of millions, especially in developing and emergent countries.

Yet surprisingly, limited attention has been given to seafood as a significant component in food security and nutrition strategies at national levels and in broader development discussions. The World Committee on Food Security in 2012 requested that the High Level Panel on Food Security carry out an in-depth study on the role of sustainable capture fisheries and aquaculture for food security and nutrition. From the perspective of those in the fisheries and aquaculture communities, this was a step in the right direction. However, international experts outside of these communities that are influencing the broader debate and policies on food security and nutrition that need to consider: how and to what extent will seafood contribute to feeding 9 billion people in 2050? Most food

security experts and decision makers may be unaware of the critical role that aquaculture is likely to have in the future.

One thing experts agree on is that this discussion also needs to occur in the United States. We import about 91% of the seafood we consume. Only 5% of our seafood supply is from domestic aquaculture. Only one in ten Americans meets the Dietary Guidelines of consuming two servings of seafood per week. It's projected that the middle class in Asia will increase substantially in the future and as a result, seafood consumption will increase in Asia, subsequently affecting the U.S. supply of seafood. Our substantial dependence on imported seafood is a food security and nutrition concern.

A compelling argument can be made that the U.S. should grow more of its seafood. Domestic aquaculture contributes to the seafood supply, complements capture fisheries, and supports

jobs and other economic activity in rural and coastal communities. Expansion of sustainable domestic aquaculture is critical to maintaining rural and coastal communities that support commercial fisheries, aquaculture, and jobs associated with the seafood industry.

Although the U.S. has the natural resources, technology and knowledge necessary for a significant aquaculture production sector, the U.S. contributes a mere 0.6% to global aquaculture production. The \$1 billion value of U.S. aquaculture production is a drop in the bucket compared to global aquaculture production of \$100 billion.

Recently, the 35th anniversary of the National Aquaculture Act of 1980 passed. Within the Act the following statement is included, "It is in the national interest, and it is the national policy, to encourage the development of aquaculture in the United States." Food for thought.

SCHEDULE OF EVENTS

February 22-26, 2016, World Aquaculture Society Triennial. Las Vegas, Nevada, Paris Hotel and Convention Center. Theme: All in all for Aquaculture.
Event details: <https://www.was.org>.

March 8-10, 2016. American Fisheries Society (AFS) Idaho Annual Meeting. Coeur d'Alene Resort, Couer d'Alene, Idaho.
Event details: registration@idahoafs.org.

June 5-10, 2016, International Symposium on Fish Nutrition and Feeding, Sun Valley, Idaho.
Event details: <http://www.ISFNF.com>.

June 7-10, 2016, AFS Fish Health Section Meeting. Jackson Hole, Wyoming.
Event details: <http://www.afs/fhs/org>.

June 7-10, 2016, US Fish and Wildlife Service, Aquaculture Drug Approval Coordination Workshop, Jackson Hole, Wyoming.
Event details: <http://www.afs/fhs/org>.

June, 11, 2016, Idaho Aquaculture Association Annual Meeting, Twin Falls, Idaho.

June 12-16, 2016, 12th International Congress on the Biology of Fish, Texas State University, San Marcos, Texas.
Event details: <http://www.txstate.edu/continuinged/Events/ICBF.html>



Biswamitra Patro making trout diet



Andreas Brezas, Matt Powell and Jason Abernathy sampling fish



Aquaponics system located on unidentified Idaho fish farm



Sage School (Hailey, Idaho)--after a tour of the Hagerman Fish Culture Experiment Station



Collaborative pilot study between the College of Southern Idaho (CSI) and the University of Idaho (UI) to determine the commercial potential for burbot (freshwater cod) aquaculture

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