Welcome to Baltimore, Maryland!!



THE INSTITUTE OF MARINE AND ENVIRONMENTAL TECHNOLOGY (IMET) – UNIVERSITY OF MARYLAND UNIQUE MARINE AQUACULTURE PROGRAMS AND OPPORTUNITIES FOR COLLABORATIONS



Recirculating Aquaculture Salmon Network (RAS-N)

2nd Annual Workshop

Building Capacity of Land-Based Atlantic Salmon Aquaculture in the US A NOAA/Sea Grant National Program

Yonathan Zohar, Lead PI Institute of Marine and Environmental Technology, University of Maryland



RECIRCULATING AQUACULTURE SALMON NETWORK

Sustainable • Innovative

Recirculating Aquaculture Salmon Network (RAS-N) A National Public-Private-Federal Partnership



We are open to adding new members, please contact me



Recirculating Aquaculture Salmon Network (RAS-N) Program Management and Leadership Teams





Recirculating Aquaculture Salmon Network (RAS-N) Background

- >90% of salmon consumed in the US (~500,000 tons) come from overseas, at a value of ~\$3.2 B (20% of seafood trade deficit)
- >\$ 2 billion investment in land-based Atlantic salmon production in the US
- Covid has accelerated interest in local, safe, land-based production
- Maine, Florida, Virginia, Wisconsin, Indiana, Texas, New-York Washington, California, Maryland, Nevada





Handbook, 2020, Undercurrent News

Recirculating Aquaculture Salmon Network (RAS-N) Final Deliverable: Road Map/Strategic plan

An extensive analysis of the status of the industry, its projected growth, biological, technological and other gaps, research needs and priorities, mechanisms to promote publicprivate partnerships and technology transfer.

Help policymakers, federal and state agencies and industry identify and responsibly allocate resources to promote an economically feasible and environmentally sustainable landbased US Atlantic salmon industry.



Recirculating Aquaculture Salmon Network (RAS-N) Delivering on objectives- Targeted Working Groups

- 1. Research and Development (B. Peterson, Chair)
- 2. Economics (S. Knoche, Chair)
- 3. Education & CWFD (A. Frederick & M.S. Tudor, co-Chairs)
- 4. Extension (B. Hubbard, Chair)
- 5. Communications (J. Smith, Chair)
- 6. Website Development (Led by WISG & PMT)



- **1.** Engage stakeholders, solicit input:
 - Inaugural 2019 RAS-N workshop (WI)- stakeholder engagement session
 - Stakeholder Satellite Session/Meeting at 2020 Aquaculture America
 - Engagement of 'new' industry stakeholders:

Skretting; Nordic AquaFarms; AquaCon, more here

2. Identify gaps and barriers, prioritize R&D and other areas to address them

- Generated initial ranked list of industry priorities/concerns via WI Stakeholder Panel
- Identified additional issues and gaps via the Working Groups & new industry contacts



Will soon build upon and revise the prioritized list via a Stakeholder Survey

Recirculating Aquaculture Salmon Network (RAS-N) Research needs- initial ranking

- Minimize/mitigate off-flavor in harvested salmon
- Understand/reduce early maturation in RAS; sterility
- Identify parameters for optimized growth, performance and health
- > Develop salmon RAS-specific feeds and alternative diets
- Study/optimize microbiome in salmon RAS (biofiltration, system/fish health)
- Technologies to increase containment, waste processing and environmental compatibility
- > Develop/breed domestic RAS-specific broodstock for optimally preforming offspring
- Health management in salmon RAS, including risk of pathogen introduction



3. Develop a White Paper (Year 1 deliverable)

- Established 6 Working Groups to gather input and write White Paper content
- Generated an initial version of the White Paper (tomorrow's session)
- 4. Economic analysis and feasibility of Atlantic salmon RAS production
 - Included several industry reps and reputed economists on the Working Group
 - Economics Working Group has gathered input and generated an Economics Survey
 - Discussion of the Economics Group's work will occur later this morning



- 5. Outreach, education and professional development
 - Facility tours incorporating salmon RAS for general public/professionals
 - Frontal classroom and online teaching on relevant aspects of salmon RAS
 - Multiple online and printed media stories
 - Developed RAS-N website, about ready to go live!
 - RAS-N sessions in professional meetings
- 6. Extension and technology transfer
 - Hired a dedicated Sea Grant Salmon RAS Extension Agent (Dr. Cat Frederick)
 - Integrated Cat into the Sea Grant Extension network
 - Engage in extension discussions with RAS-N partners and beyond
 - Currently developing an extension plan with U. Maryland Sea Grant Extension
 - Stakeholder Survey and looking to collaborate on Public Perception Survey
 - 1-2 Fact Sheets + Webinars on Choice Topics (input desired)



7. Education & Career and Workforce Development (CWFD)

- Included industry on the Education & CWFD Working Group
- Developed an initial model for implementing programs
- Education & CWFD Group's work will be discussed tomorrow morning
- 8. Demonstration technology and hands-on training/extension projects
 - RAS-N demonstration projects are ongoing
 - A few will be discussed here
 - This may have been the objective most affected by COVID-19



Recirculating Aquaculture Salmon Network (RAS-N) RAS-N Web Site

What is RAS

- Website Development led by WISG
- **Content generation led by the Project Management Team**
- On the verge of launching live RAS-N Website





Sample tabs of website **RAS-N** Activities

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identify Technological and Scientific Gaps and Prioritize Research to Address Bottleneck

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+ EDUCATION, CAREER & WORKFORCE DEVELOPMENT WORK GROUN

+ WEB DEVELOPMENT WORK GROUP

Text won't be this small on live site, these are zoomed out screen shots so the whole page can be seen

Front page of website

Recirculating Aquaculture Salmon Network (RAS-N) Building Capacity of Land-Based Atlantic Salmon Aquaculture in the US

Lets get started! Thank you for attending!

