Appendix IV- Categorized Notes

Ignite Session #1 -100,000 MT of Unharvested West Coast Trawl Groundfish: The Challenge and Opportunity

Summary of Interactive Session on the Four Topics

1. Seafood Systems Issues –
   - Regulations-Streamline-Flexibility in regs
   - Rebuild consumer demand-understand consumer needs-connection to consumer
2. Research Topics –
   - Marketing-consumer perceptions-survey research
   - Economic analysis of Seafood Systems
   - Maximize yield and value from the fish/waste-and underutilized species
   - Food science-innovation
3. Education and Curriculum Needs –
   - Cross & trans discipline & sector coursework, (non-policy related)
   - Marketing
   - Modeling Analyses (fisheries related)
   - Food Science
   - Policy and Management with inter-disciplinary studies (e.g., business)
4. Stakeholder Training and Outreach –
   - Labeling with emphasis on "Wild Caught & Sustainable"
   - Quality Standards
   - How to tell the story of West Coast Groundfish-chef outreach, sustainability?
   - Consumer awareness

Complete Notes, Categorized (number of times mentioned in parenthesis)

What major **seafood system issues** did the session highlight?

Topic	Comments
Regulatory & Management Issues	• Need for fluidity/flexibility in regulatory management • How can a system of regulation be nimble? And for what species? ○ E.g., by using ecosystem based management strategies • Streamline regulations • Process to make change is political and slow • Consumer is absent from the regulatory process • Make Fishery Management Council more adaptive to available information and current science • Outdated regulations/bureaucratic inertia

Industry-wide	• Consider Aquaculture that compliments/is integrated into wild fisheries • Learn to look at fish as a food system
Stock Assessment	• Increase accuracy of forecasting and reporting
Infrastructure	• Overall need for upgraded infrastructure for fishing and seafood industries
Consumer Education	• Importance of consumer education on groundfish • Rebuilding or building demand for groundfish domestically • There need to be opportunities for consumers to ask questions and receive answers from trusted sources – possible topics include seafood fraud, product/food trust • Provide resources for how to prepare rockfish
Technology/ Gear/ Engineering	• Get universities in front of technology needs in industry
Business/ Marketing/ Market Research/ Entrepreneurship	• Develop new markets in different countries • How to make American seafood competitive • Consumer traceability • Build consumer trust in product and story • Industry has to connect to consumer interest in the product • Create more demand by knowing consumer needs and preferences • Acknowledge that consumers are not making purchases for rational reasons • Shift focus from internal to consumer needs/wants • Work to involve consumers in the system
Questions Raised	• Who do you feed first? • What is 'sustainability' in a system? • Can capacity be increased to facilitate faster ecosystem based management decisions? • What data is out there for groundfish? • Production vs. consumerism – which do they want? • How can industry make seafood locally accessible at an affordable price point?

What **research topics** did the session reveal or highlight?

Topic	Comments
Technology/Gear/ Engineering	• How to design gear to harvest select stocks and release unwanted ones – "choke" species are limiting quota harvests • Research comparative extraction systems to find solutions • How to maximize freshness on small boats

	• Cryogenic tech on vessels • At-sea processing • Gear research to exclude bycatch to access underutilized stocks (e.g., software) • Evaluate possible engineering competition to innovate storage/distribution methods
Business/ Marketing/ Entrepreneurship	• Conduct research on seafood marketing strategies • How to use consumer research to advance seafood sales • Apply consumer perception research to seafood branding strategies • Can past ad campaigns be used to inform marketing of untapped/lesser known species • Impact of storytelling as a marketing tool – how it can influence consumer choice • Create/investigate markets for "waste" products • Assess public perception – what makes your white fish stand out • Investigate whether names of fish impact consumer interest
Food Science and Technology/ Value-Added R&D	• Develop new forms of protein from fish • Evaluate health benefits of seafood and seafood byproduct consumption • Beneficial uses of fish processing waste – are there markets? • Innovative creation and development of new products (investment needed) • Increasing recovery of and extracting value from byproducts. • Research how to optimize quality for top dollar (dover sole is the example given) • Assess how to ensure consistent product • Ensure that students are taught proper freezing/storage and handling practices
Stock Assessment	• Build natural history and biology into stock assessment

Economics	• Assess impact of recreational fisheries on industry as a whole
	  ○ What are the direct and indirect economic costs/benefits
	  ○ How does this segment of the industry impact economic models?
	• Economic monitoring and modeling of "seafood systems" in order to create good metrics and indicators

Education	• Include seafood literacy in high school • Effectively communicate seafood nutrition facts (to consumers)
Regulatory and Management Issues	• Accumulate better information about regulator incentives in order to access underutilized stocks • Create models to speed up PFMC decisions in order to enable adaptive responses to resource availability and spatial planning

	• Assess cost of US regulations and how that plays out in the marketplace (e.g., competition with non-domestic tilapia)
Consumer/ Market Research	• What determines consumer value? • What do consumers want to eat? • Investigate the gap between consumer ideology and reality • Assess consumer perceptions of seafood – is there demand? • Determine how much transparency consumers really want – don't assume anything • Are associations (with a place, for instance) important to consumers? Is it a selling point? • Sociological survey research • Conduct consumer research "in situ" • Measure consumer purchase habits (said a few times in different ways) • Social science research – Economics, anthropology
Fishing/Fisheries	• Assess developing fishermen co-ops • Assess why fishing quotas are not met and how to increase percentage to 50-60% • Conduct research regarding quota percentages caught before and after Rockfish Conservation Areas established • Determine how to maximize yield in an individual transferrable quota fishery
Aquaculture	• Assess possibilities for cooperation between wild caught and aquaculture industries • Black cod can be produced via aquaculture – is there a demand bottleneck?
Industry-wide	• Is it useful for different segments of industry to cross-pollinate and share ideas? How to facilitate (mentioned twice)

What **education and curriculum needs** including **degrees/programs/courses** did the session reveal or highlight?

Topic	Comments
Business/ Marketing/ Entrepreneurship	• Marketing (mentioned several times) • Students and industry need basic business courses • Analysis of big data • How to market untapped seafood products/species • Seafood systems specific marketing and business courses • Supply chain and logistics management
Food Science and Technology/ Value Added R&D	• Courses in food systems/distribution/cold storage packaging • Culinary courses for seafood (groundfish specific) • Nutrition Science • Connecting seafood with concepts from other food systems

	• Frozen product methods • R&D value-added products (e.g., baby food) • Food safety and medicine
Transdisciplinary	• Cross-disciplinary/trans-disciplinary training was mentioned several times • Propose that people learn in teams from different disciplines to promote different perspectives • Combining fishery management and business for regulation • Create interdisciplinary experiences and crossover between areas (e.g., food science, marketing, ecology, business) encouraging collaboration among disciplines
Fishing/Fisheries	• Fisheries policy • Fisheries/marine policy program
Economics	• Seafood/fishing specific economics courses • Bioeconomic models for different harvest regions (including catch scenarios)
Technology/ Gear/Engineering	• Materials Science • Quantitative skills and ability to analyze complex models and statistics • Ocean technology • Electrical engineering, computer science, robotics in plant resources
Continuing/ Vocational/ Technical/ Hands-on Education	• Professional/vocational training in seafood processing, fishing • Externship opportunities • Labor force training (training of the labor force or train the trainer type education?) • Program for high school or trade school that results in reliable workforce
Socioeconomics/ Demographics/ Communication/ Relationship Building	• Sociology – survey research of consumers • Anthropology, cultural values, community dynamics

What types of **stakeholder training and outreach** did the session suggest?

Topic	Comments
Seafood Processing	• Cold supply chain • Quality standards
Consumer/Public	• Educate about frozen seafood product • Increase consumer awareness of groundfish – persuasive marketing • Education about protein/fish – “US Fisheries are sustainable”

	• Address public perceptions of overfishing • Connect consumers directly to fishermen and their product
Transdisciplinary	• Internships/job corps/continuing education • Work with aquaculture and wild industries to make a cooperative industry • Connecting the supply chain and educating all levels of the chain • Develop joint consumer/industry workshop trainings • Create unified stakeholder/agency/regulatory opinions to expedite action • Determine who the right players are for innovating and differentiating the best markets – there are a lot of moving parts in the seafood system and they all need to be part of promoting groundfish o Who creates demand and based on what?
Socioeconomics/ Demographics/ Communication/ Relationship Building	• Involve all aspects of industry (2) • Engage (OSU) students in team building and tackling issues with stakeholders • Create outreach events
Business/ Marketing/ Entrepreneurship	• Determine how to best tell the US West Coast Groundfish Story and communicate that to consumers • Tap into tourism to promote seafood • Partner with wineries • Connect with schools – kids cook and/or watch chefs cook and then they take the food home – this is also a publicity event with media coverage • Increase number of free fishing/crabbing days to attract tourists/consumers/locals • Create fishing events for kids • Create Oregon Seafood Days • Create outreach events • Capitalize on “sustainable” and “wild caught” labeling • Standardize labeling to be honest and promote trust (labeling was brought up several times) • Define “sustainability” • Work with celebrity chefs and events to promote seafood • Simple messaging about what groundfish is • Promote trust (said regarding labeling and marketing) • Promote nutritional value • Work with “box” food delivery systems

What **other issues** did the session reveal that would be relevant for designing and managing the Center?

Topic	Comments
Aquaculture	• Animal welfare – how to assess aquaculture vs wild • Aquaculture has perception issues in Oregon • Aquaculture as a solution
Education	• More training, not enough government jobs • Improving the management curriculum • A skilled workforce connecting consumers and scientists to industry • Understanding effects of changing ocean conditions
Seafood Processing	• Independent processing capabilities • Substantial need to connect seafood with consumer
Fishing/ Fisheries	• Evaluate history of groundfish – would we have the same status now if there had been more flexible processes in placed (e.g., gear to be used)

Common Words (number of times mentioned in parenthesis)

- Consumer (5)
- Marketing (2)
    - Related words
        - Story
        - Market
        - New Markets
        - Public Perception
        - Marketability
- Sustainability (2)
- Trust (2)
- Consistency (2)
- Connecting/Connect
- Cross-pollination/cross-fertilization
- Boat to school
- Streamline
- Big data
- Dynamic
- Team experiential experiences
- Farmer's markets for seafood
- Incentives
- Poor management
- Cooperation
- Products
- Supply
- Education
- Habitat
- Dover Sole
- Wild
- Innovation
- Regulation
- Costs
- Value
- Demand

Ignite Session #2- The Challenge of Developing Policy-Relevant Models for Fishery, Aquaculture, and Seafood Management: The Case of Dungeness Crab

Summary of Interactive Session on the Four Topics

Seafood System Issues –

- Trust among partners/stakeholders
    - How to gain? How to preserve?
    - Effective communication and transparency in transactions/discussions
    - In how forecast tools will be used– is anything truly 'policy neutral'?
    - Role of a center?
- Timely and necessary science
    - Lag times- Science to/from policy/management
    - Expert opinion
    - Tools with adaptive capabilities
- Equity, recognition and reputation
    - Value of crab to local communities
    - Allocation of access to resource and profits

Research Topics –

- Natural mortality
    - Life stages
    - Patterns & Processes
- Effects of environmental changes
    - Ocean Acidification
    - Hypoxia
    - HABS: Domoic Acid
- Models
    - Adaptive to new information
    - Clear goals, needs, expectations, limitations
- Cooperative research
- Social science/human dimensions

Education and Curriculum Needs –

- Science communications
    - 'demystifying models & methods'
    - Uncertainty
- Ethics & psychology
- Survey courses- seafood systems
- Experiential
    - Internships- e.g., students on boats as observers?

    - Fish 'hackathons'- cross pollination w. computer science, engineering, IT
- Professional development
    - Business
    - Consumer education
- Life cycle dynamics & forecasting
- Human dimensions
    - Social science & public policy training
    - 'community economics'

Stakeholder Training and Outreach –

- Continuous effective public outreach & education
    - Build trust
    - Create 'laymen' friendly graphics
    - Workshops to 'demystify' tools
    - Build cultural understanding
    - Stakeholder field trips
    - Build facilitation skills
    - Professional development opportunities
    - Engagement in research & education
    - Increase equity/inclusion
- K-12
- Expert knowledge processes
- Public exposure to 'fishing stories'
- Role of center- Honest broker

Complete Notes, Categorized (number of times mentioned in parenthesis)

What major **seafood systems issues** did the session highlight?

Topic	Comments
Terrestrial Agriculture	• There is a difference between wild-harvest fisheries which operate within a strong conservation mandate and agriculture

Models/Modeling	• Expectations of model accuracy are high – work on ways to communicate model uncertainty to stakeholders without jeopardizing trust in the process
	• The uncertainty inherent in models leads to lack of trust from fishermen – could this model hurt our jobs?
	• Models need to be flexible to future issues – they cannot just be built and stay static
	  ○ Takeaways
	  ▪ Trust
	  ▪ Policy-making
	  ▪ Relevance

	▪ Multiple goals (economics, fleet, biomass) • Is it possible to create a multi-fishery model? • Have to consider the natural variability and vulnerability of the stock • Models are under-parameterized • Models can be used to help evaluate management strategies • OSU had a lot of economic and biological data for this model o What information should be provided in an easily accessible tool to inform management decisions? o Have to evaluate trade-off based on goals within the model
Fishing/Fisheries	• Distribution of benefits/fishermen's access to this resource- who gets the profit? • Equity in allocation of fishing resources – small markets/small boats cannot compete with a large fleet • This particular model would have favored a large fleet – those that wouldn't be affected much by a shift in season • Industry's main concern with tools is increasing efficiency – they want to increase crab value • Limited vessels, permits • Fishing restrictions, seasonality of industry • Lack of trust from fishermen – concern about job loss
Regulatory and Management Issues	• There is no existing management plan for Dungeness crab • There is a lag time between what's happening in the ocean, what scientists are saying, and how policy/regulation/management responds.
Socioeconomics/ Demographics/ Communication/ Relationship Building	• Ineffective communication among stakeholder groups – OSU modeling group, Oregon Dungeness Crab Commission, Fishermen, Regulatory agencies. (2) • Trust within stakeholder groups and between stakeholder groups needs to be strengthened – use the process to build this trust (8) • Increase transparency between agencies and fishermen, as well as between different fleets/families, between recreational and commercial fishermen, and among • Recognizing the value (monetary/cultural) of crab to communities • Most valuable fishery in Oregon - $43-$44 M annually • It is important to protect the reputations of both the crabbers and the commission • Must be cognizant of protecting fishermen's trade secrets • Crabbing is a socioeconomic issue • Knowledge impacts policy – it has to be carefully transmitted

	• There was no mention of integrating fishermen and people on the ground into the process (reframing of questions)
What is missing?	• Lack of biological information (from egg stage and beyond) to accurately inform the model – this goes for all marine species, not just crab • Measuring the natural mortality of seafood resources • The audience for this model did not take recreational fishermen into account
Technology/Gear/ Engineering	• New gear to prevent entanglements
Questions Raised	• Does anyone ever believe anything is policy-neutral? • Who manages tool development, increasing awareness of these tools and educating people on how to use them, and maintains them?

What **research topics** did the session reveal or highlight?

Topic	Comments

Fishing/Fisheries	• Crab life cycle/natural mortality (mentioned 6 times)
	• How to reduce handling mortality
	  o What are the implications of soft-shell crab handling?
	  o How can mortality be limited? How bad is the mortality problem really?
	• Effects of ocean acidification/Hypoxia
	• Domoic acid – can it be predicted?
	• Vulnerability at different life stages
	• More research involving fishermen regarding improving survival
	• Research needs to incorporate recreational fishing interests – would provide new questions and ideas (2)
	• Collect tag(?) and DNA data
	• Collect/incorporate tribal and catch/release data
	• When should the fishery close for the year? What is the best time?

Models/Modeling	• Estimating natural mortality across life stages, including life stage specifics • Incorporating new information into models needed so that they represent all needed information to address system questions about the fishery • More real-time research is needed to parameterize the model (e.g., distributions, more current natural mortality estimates) • Use information from fishermen regarding their catch experiences to inform model (2) • Incorporate acoustic models to help find species

	• Address how best to communicate uncertainty in models- conduct research into parametrics (e.g., mortality) that are uncertain but highly influential in models • Explore dynamic modeling methods other than stock recruitment relationship – not informative • Management of models and tools • Incorporate end-users in testing/giving feedback on tools and models • Ocean condition modeling to avoid whale interaction • Bioeconomic models for use in other fisheries • Evaluate policy-relevance of model • Evaluate trade-offs • Where are the gaps in the research (e.g., information from fishermen relative to academic data)? • Is it possible to capture all ecosystem aspects of the seafood market in one model? o Fishery interactions? Broad system?
Socioeconomics/ Demographics/ Communication/ Relationship Building	• How to increase truthful communication among constituencies • Create a culture of investment for researchers (e.g., help them care about the business/community they're serving) • Make each researcher's background transparent to the stakeholders • Can a model account for the cultural value of the crab fishery in Oregon?
Stock Assessment	• Could stock assessment help inform the model?
Business/ Marketing	• Use blockchain for traceability • Evaluate different market needs for different sized boats
Consumer/Market Research	• Market demand – how does it vary seasonally?
Economics	• What are the economic impacts of closing the fishery earlier? • What does mortality (natural and handling) mean for the economics of the fishery?
Regulatory and Management Issues	• Increase understanding of our fishing fleets for government regulators/scientific policy-makers • Develop more adaptive management systems • What are the management goals of the fishery? (2)
Technology/Gear/ Engineering	• Research catch gear to mitigate whale entanglements • Innovation to understand behavior and reduce stress (of crabs)
Transdisciplinary	• What are the economic and environmental impacts of a delayed season? (may be complicated by other environmental concerns, e.g., domoic acid)

Food Science and Technology/Value-Added R&D	• Harvesting soft-shell crabs for other uses, such as chitin related products • Explore the possibility of a 100% appropriate retention fishery • Soft-shelled crabs are discarded in Oregon because they are not valuable

What **education and curriculum needs** including **degrees/programs/courses** did the session reveal or highlight?

Topic	Comments
Continuing/Vocational/ Technical/Hands On Education	• Industry internships to create overall understanding of the whole system • Student opportunities in Sea Grant/Extension • Training on different sizes/classes of boats – students on boats as observers? • Provide opportunities for social science students to spend time in the field on boats • Business education for fishermen • Training offered for all different types of fishermen (e.g., 7 subclasses of the crab fleet)
Models/Modeling	• More courses in different types of modeling for fisheries (bioeconomic, dynamic, etc.) • Additional quantitative training • Population dynamics, forecasting, numerical modeling • Incorporate ecosystem factors into population dynamics models • Training in model and tool development • Course offering – demystifying models; integrating models and management • Spur interest in bioeconomic model to generate the best management decisions and inform policymaking
Socioeconomics/ Demographics/ Communication/ Relationship Building	• Courses in research communication, specifically demystifying models and methods – articulating what a model or specific research method can and can't do • Understanding and communicating uncertainty • Communicating science to laypeople • Teach how to communicate with industry to build trust in the science • How do you build trust into a curriculum so that students understand its importance when they enter industry? • How can we engage the next generation?
General	• Broader baccalaureate core course requirements
Ethics	• Students should take an ethics course – future researchers must be taught accountability

	• Learning to apply a broad-level ethical mindset to real issues (Fits in with MSI goals – applying a broader ethical approach in my field)
Seafood Systems	• A seafood system overview course – understand the whole and how all the parts fit together
Economics	• Study economic and environmental factors and how they interact • Provide training in economics of a community to contextualize the importance of the local fishing economy
Transdisciplinary	• Cross-pollination of research data and policy to gain broad trust of the fishing community • Biology/economics/business interdisciplinary courses • Economics, public policy, business • Cross-pollination with computer science and engineering • Ensure that outreach goes beyond fishermen to other relevant community segments (e.g., tourism/hospitality)
Regarding the Center	• Consider a different title – "food" is too narrow. Maybe Sea to shore?
K-12	• Begin teaching seafood systems topics during K-12 education

What types of **stakeholder training and outreach** did the session suggest?

Topic	Comments
Consumer/Public	• Seasonality of crab harvest • Increase public outreach and education about fishing/fisheries – an informed public means "fewer pitchforks" • FFTS can help generate interest to go beyond the same few people who go beyond the same few people who attend all the Crab Commission meetings • Provide more opportunities for public contact with the fishing industry – create visual examples of fishermen at work, drawing interest of the non-fishing community
Transdisciplinary	• When a stakeholder contacts ODFW or the Crab Commission with questions (e.g., softshell mortality) there has to be an inclusive research process that's taken place to answer the question so that the answer can be trusted • Acquire and incorporate the best available knowledge from multiple stakeholders in order to effectively share and compile information • Can Sea Grant be enlisted to assist with organizing opportunities for public input/engagement in the research process?
Socioeconomics/ Demographics/	• Effective communication • Building trust

Communication/ Relationship Building	• Work must be sensitive to the commercial fishing culture • The science must be presented well and in an accessible way (e.g., scientific papers about relevant topics must be presented accessibly to stakeholders) • Connecting science to non-scientists and real-life experiences to scientists • Develop facilitation/communication skills in scientists • Communicate with stakeholders to understand their needs – don't just present curriculum with no feedback • Engage industry in setting research priorities and agenda • When you interact with stakeholders, be sure to provide feedback on what you developed with their help • Complete information on a topic should be available to all of the participants in the system • Need to involve more than the commission in the process
Models/Modeling	• Need to ensure a layman friendly user interface and interactive graphics • Conduct workshop(s) to demystify modeling and inform methods • Explore concerns raised about assumptions made within the science and its models with the fishermen and others who raise them – use the expert knowledge they can provide
Fishing/Fisheries	• Reach out to younger fleet folks to engage them in the research • What kinds of professional development opportunities are available to fishermen that can help facilitate communication and scientific understanding • Provide education opportunities for stakeholders – training on using science to get better fishing results, policy changes, and advocacy • Can the center provide an incubator to guide fishermen beyond nuts and bolts
The Role of the Center	• The center must be an honest broker of information to all sectors • Leverage OSU new hires from MSI to make community connections where federal agents cannot • How would the Seafood Center have dealt with this issue? How would they do more/do things differently?

What **other issues** did the session reveal that would be relevant for designing and managing the center?

Topic	**Comments**
Representation	• Expand scope of engagement to include underrepresented groups

Retail/Restaurant	• Help retailers/restaurants adapt to handle a closed crab season (e.g., can crab be par-cooked and frozen to fill Christmas demand?)
Funding	• Research and industry cross-funding on a common goal
Fishing/Fisheries	• A lot of the issues discussed here apply to other fisheries

Common Words (number of times mentioned in parenthesis)

- Trust (6)
- Communication (3)
- Uncertainty (2)
- Inform
- Expectations
- Transdisciplinary
- Accountability
- Understanding
- Summer Crab
- Research
- Fleet
- Mortality
- Economics
- Community
- Engaged Scholarship
- Recreational Interest
- Better local connections
- Socioeconomic impacts
- Funding
- Cross data
- Not “food”
- Efficiency
- Reputation
- Cultural Value
- Adaptive
- Process
- Industry
- Engagement
- Advocacy
- Results
- Tools
- Model

Ignite Session #3- Innovation on Working Waterfronts: Developing Creative "Infrastructure" to Support Diverse Seafood Industries

Summary of Interactive Session on the Four Topics

Seafood System Issues –

- Infrastructure loss/challenge in redeveloping/maintaining reliable infrastructure
- Challenges in developing/commercializing good ideas (investment/financing needs, connecting entrepreneurs with the necessary technology/production capacity)

Research Topics –

- Identifying new/emerging markets for seafood/related products
- Product development for full utilization/increased value

Education and Curriculum Needs –

- Business, entrepreneurship, innovation courses, perhaps built into a fisheries degree program or certificate
- Trans-disciplinary education (degree programs)

Stakeholder Training and Outreach –

- Connecting seafood industry members to: investors, business development experts, scientists, technology experts, consumers, etc. "A center should be a bridge/facilitate connections."
- Technology transfer

Complete Notes, Categorized (number of times mentioned in parenthesis)

What major **seafood system issues** did the session highlight?

Topic	Comments
Infrastructure	• Need to build/rebuild infrastructure that supports the seafood system (2) • Loss of processing infrastructure over time has huge long lasting impacts on the strength of the industry (2) • Lack of reliability (2) • Need to build the human connections in the marketplace/community as well • Conversion of existing buildings and infrastructure for seafood and aquaculture-related uses (e.g., conversion of poultry houses to grow shrimp)
Quota	• Regulation of quota • Transfer of quota • Management of individual quota needs to be examined • Fishermen not using quota to capacity

Funding	• Need for financing/investment in entrepreneurial ideas on working waterfronts • Entrepreneurial ideas in the seafood system need venture capitalists • How are fishermen financed? Public dependent? Private dependent? Both?

Business/ Marketing/ Entrepreneurship	• Challenge of commercializing good entrepreneurial ideas (2)
	• Increase market share of local product (replace imports)
	• Replication of Iceland model?
	• What is the economy of scale for local seafood hubs? How can these hubs be created? Capitalize on the existing local seafood system?
	• Economic actors need to drive development of these new working waterfronts
	• Everyone needs to understand the market
	• Encourage a value of "giving back" to fishing communities (like the Iceland Ocean Cluster) – hopefully young fishermen will give back to their supportive communities
	• Services (such as processing) need to be supported as strongly financially and by the community as products.
	• There is a mismatch of scales between supply and demand which is difficult to engineer
	• Community supported fisheries (like community supported agriculture)
	• There seems to be support for only some aspects of industry
	  ○ Business opportunities to fill in gaps (in processing, providing equipment
	  ○ Opportunities for young people that aren't fishermen

Socioeconomics/ Demographics/ Communication/ Relationship Building	• Instill a sense of common good within the community – healthy working waterfronts benefit all • The "graying of the fleet" – many of the fishermen are aging out, and there are not enough young people coming up to take over (3) • It is expensive to get into commercial fishing – permits, quota, vessels, etc. – finding a good path to ownership is rare • The local community must be included in the beginning of the process of developing these working waterfronts – have to have buy in • Some places have a healthy and supportive community but are missing critical industry players ○ In some cases foreign distributors have filled in gaps and created a relationship. • Include perspectives from fishermen at the outset.

Seafood processing	• Can collaboration be encouraged between small and medium processors to strengthen the business?
	• Lack of financial support for new processors
	• Lack of support for local processing – many have closed and they are hard to rebuild
	  o Some services cannot be free – need buy-in
	  o Creating value doesn't seem to include processing

What **research topics** did the session reveal or highlight?

Topic	Comments
Funding	• How to direct more money toward working waterfronts • What part of funding/grants can support fishermen with fuel, bait, and ice to allow for solid infrastructure in the community? • What is the viability of community funded infrastructure projects such as hoists? • Look to Iceland Ocean Cluster for information – their operation takes a business approach with no federal grant support – this is led by the business community (private sector) o They have 65 paying members (btwn $1k-$20k) • Venture capital fund – sold 2 startups, owns 8 startups • Social impact investments
Food Science and Technology/ Value-Added R&D	• Chitin from crab shells – get shells from processing plants • What byproducts can be utilized and for what purposes? (3) • Use new product development to meet evolving market demand
Infrastructure	• Explore alternative refrigeration types (besides ice)

Marketing/ Business	• Explore ways of creating strong local demand for local seafood
	• Potential of using CSA and/or mail-order meal service programs to support local fish/groundfish
	• Additional research into business, finance of seafood system needed
	• Encourage an entrepreneurial culture among scientists to get science into the commercial market
	• Look to agriculture more broadly for partnerships, cross-pollinating – efforts do not need to be exclusively ocean-focused (2)
	  o Can a "food hub" be developed to support a more robust seafood market?
	  o Develop local demand for local fish
	  o Hire marketing manager, rebuild supply chain
	  o Traceability, cooperation and business support
	  o Explore supply chain – getting products to market
	  o Services provided within the "hub" benefit all participants

	• What can we learn from communities that have strong extant seafood systems? • Examine supply chain logistics at variable scales • Explore scalable development of fishing and processing – (e.g., begin with hook and line, small ice machine) • What other industries can be used as models? • Spark greater interest in seafood consumption in younger generations and in American culture as a whole
Consumer/Market Research	• More seafood market research
Economics	• Explore the question of creating local/regional food systems and the associated economy of scale. ○ Include macro-economic drivers and impact as well as micro (local impacts and drivers) – can the two co-exist?
Regulatory and Management Issues	• State/local regulation/agreement to cap fuel prices – could increase competition and lower prices for consumers
Quota	• What is the impact of communities vs. individual fishermen holding quotas? • Explore how to help community quota funds anchor quota within a community (3)
Socioeconomics/ Demographics/ Communication/ Relationship Building	• Include promotion of a desired lifestyle, heritage, and culture in the value of promoting working waterfronts – not all about economics • Consider the human dimensions • Enable conditions for successful enterprise to thrive (harvester, consumers) • Balance elite consumer market with social justice
Aquaculture	• Conversion of poultry houses to grow shrimp/closed places for aquaculture – need feasibility studies, sociological research and understanding group dynamics of the community to know whether it would be supported • Do we understand all the potential opportunities for aquaculture?
Industry	• Source research topics from industry – let them identify pinch points for exploration
Environmental	• Balance conservation impacts with economic growth
Technology/Gear/ Engineering	• Find out what new technology is being used in the field and how well its working (both fishing and processing) (2)

What **education and curriculum needs** including **degrees/programs/curriculum** did the session reveal or highlight?

Topic	Comments
Transdisciplinary	• Cross-pollination with other disciplines (agriculture, food science, business, pharmacy, etc.) (2) • Building out fisheries careers to include business, advertising, processing technology, etc. • Collaborative course series/degree with expertise from different schools/universities • Use OSU's agriculture expertise and apply to seafood • Introduction to what fishing is (like Scott Heppell's course on seafood systems) to increase exposure and general awareness • More opportunities through MSI to train students in marine industry operations (2) • Providing opportunities for speakers from different marine fields to speak at the university • Incorporate food science, business, pharmacy into marine-related coursework • Incorporate mandatory "field" time into seafood systems degree programs – can expose students to different perspectives and issues of developing trust with a community • Provide more direct access and opportunity for. Students in marine industries • Marine advisory program for business interests, students
Business/Marketing/ Entrepreneurship	• Develop a course in entrepreneurship in marine/fishing/seafood industry (certificate) (5) • Integrating business into other disciplines • Maritime business, specialized certificates in the business of fisheries • The business of seafood • Business hub program • Courses on conducting feasibility studies • Business education for young fishermen • Connecting science/research with business • Explore cultural diversity as a way of finding new markets
Food Science and Technology/Value-Added R&D	• Use connections with other institutions connected to OSU • Seafood innovation lab – consumer testing and tours Labs/work for "waste" byproduct development • Opportunities for student projects using crab shells
Ethics	• Need to teach ethical principles in seafood systems

Socioeconomics/ Demographics/ Communication/ Relationship Building	• Community sustainability • Develop a course on vibrant working waterfronts ○ Should include field trips to great working examples and 'stagnant' waterfronts to teach essential features
Continuing/Vocational/ Technical/Hands On Education	• Training/apprenticeship program for young fishermen • Labor force training – processing
K-12	• Add seafood/fishing as areas of exposure • Bring recipes to schools

What types of **stakeholder training and outreach** did the session suggest?

Topic	Comments
Funding	• How to connect seafood entrepreneurs to investors/financiers • How to create access to infrastructure • Include local banks/credit unions in talks to support new business • Create opportunities to connect small business hopefuls with financing
Consumer/Public	• Educate consumers on the value of domestic seafood • Role for Sea Grant in education and expansion – expose more people to what fishing is • Provide recipes/training to the public to make seafood less intimidating • Use Saturday markets as a venue to share information • What does the consumer really want/need (market research)? • Working with/educating the general public on the value of working waterfronts
Technology/Gear/ Engineering	• Technology exposure/transfer/training for stakeholders • Transfer of technology to new stakeholders
Vocational/ Technical Education	• Young fisherman apprenticeship/internship programs (like in AK) • Job fairs?
Business/ Marketing/ Entrepreneurship	• Business related advisory programs for marine professions • Provide training on seafood systems for venture capitalists • Encourage an entrepreneurial mindset in people working in seafood system (2)
The Role of the Center	• Sharing international models • Journalism function inside center • Putting disparate views under one roof • Creating an environment for transdisciplinary sharing of information • Someone to bridge gaps between groups

	• Broker connection between fishing community and science community • One stop shop for stakeholders and students alike • Business resource center for community • Connecting fisherman to developer to investor • Marine advisory programs – University offers more affordable support than private industry
Socioeconomics/ Demographics/ Communication/ Relationship Building	• Advocating for career development in industry • Advocating for affordable housing in coastal communities • Include former/retired/retiring fishermen in planning – ensure that that institutional knowledge is passed on

What **other issues** did the session reveal that would be relevant for designing and managing the Center?

Topic	Comments
Business/Marketing/ Entrepreneurship	• Develop a narrative around seafood that connects it to place as a way of creating interest among consumers • What is "local" depends on perspective
FFTS Fundraising	• Can FFTS create a financial opportunity to rent space to meet the mission of the center? • Can users of the space have an annual membership fee instead of statement of work/contract basis?
Socioeconomics/ Demographics/ Communication/ Relationship Building	• General ignorance about what fishing is (meaning all that goes into it, how much it costs, how it's regulated, etc.) – what are the best ways to educate people on this? • Community building – issues such as generation of interest or bringing people into rural areas – all of the people working on an issue (researchers, funders, community advocates, different segments of industry, etc.) need to understand hot button issues. • As working waterfronts are developed, ensure that the innovations and economic benefits make it back to the fishermen.

Common Words (number of times mentioned in parenthesis)

- Partnership (2)
  - Research Partnership
- Local (3)
- Community (2)
  - Local Community
  - Community Focused/Control
- Crab (2)
  - Chitin (2)

- Business (2)
- Industry (2)
- Traceability (2)
- Creativity (2)
- Innovation
    - Innovative Use
- Research
- Careers
- Services
- Small-scale
- Market opportunity
- Product
- Fisherman
- Recipes
- Infrastructure
- Connect
- Scalable
- Cross-fertilization
- Training
- Value
- Technology
- Recipes
- Product
- Capital
- Entrepreneurship
- Action

Ignite Session #4: Aquaculture: Opportunity or "Wicked" Challenge? Local, National, and International Perspectives

Summary of Interactive Session on the Four Topics

1. Seafood System Issues –
   - Lack of support and political will
   - Poor perception
   - Lack of infrastructure and labor
2. Research Topics –
   - Research that cuts through perception with hard data
   - Research that identifies Oregon's opportunities (location, type, markets) for production and processing
3. Education and Curriculum Needs –
   - Oregon is an aquaculture state, connect students to aquaculture systems that reflect Oregon's "good" Ag reputation
4. Stakeholder Training and Outreach –
   - Building consumer confidence in aquaculture production to enable support for infrastructure development
   - Alter perceptions of consumers through training that demonstrate how aquaculture can beneficially impact their community

Complete Notes, Categorized (number of times mentioned in parenthesis)

What major **seafood system issues** did the session highlight?

Topic	Comments
Business/Marketing/ Entrepreneurship	• Is there a market for aquaculture? • Marketing is key – finding a market in Oregon that is willing to accept aquaculture as an industry • Co-marketing of aquaculture and wild-caught fish to increase the total domestic market • Embracing aquaculture can expand the seafood market overall • Finding a market for aquaculture in Oregon is challenging – how can marketing assist with changing the perception?
Economics	• Many economic challenges
Regulatory and Management Issues	• Federal and state regulatory permitting systems present challenges to establishing offshore aquaculture (2)
Funding	• Lack of capital for startup and operation maintenance • It is difficult to attract investors, especially with little community/state support
Public/ Consumer	• Lack of public support (2)

	• Aquaculture's bad press is a hindrance to consumer engagement
	• Concerns about environmental impact of ocean aquaculture
	• Can find out what the conversation is now:
	  o Where is aquaculture going?
	  o What are people thinking about it?
	  o Is it possible to get positive public perception?

State/Federal	• Lack of political will/state support (2)
Infrastructure	• Lack of infrastructure to start aquaculture enterprises (2)
Labor	• Lack of labor (2) • It is difficult to retain employees
Environment/ Ecology	• Can water quality be maintained to ensure safety of seafood for consumption? • Space in the ocean is already used for many purposes • There is not an organized system of understanding where plots are, or where things could be grown.
FFTS Considerations	• Should aquaculture be part of the FFTS center?

What **research topics** did the session reveal or highlight?

Topic	Comments
Fishing/Fisheries	• Why isn't there more mussel aquaculture? • Should we be eating exclusively wild-caught fish? Is that a realistic plan? • Can mariculture help Olympia oyster with recovery of population? • What are the best species for aquaculture? (Sturgeon, crayfish?) • Can aquaculture be used to restore native oyster populations? • Consideration of fishing culture – fishermen are not farmers
Food Science and Technology/ Value-added R&D	• Is the nutritional value of aquaculture different than wild-caught/harvested? • What is the best way to develop aquaculture products? • Quality issues – understanding how new systems impact product quality • Which plant-based foods could be grown successfully using aquaculture?
Terrestrial Agriculture as Model	• Research on building strong and successful farm systems • Explore similarities and differences between aquaculture and terrestrial agriculture – conduct comparisons – are they very similar?

Technology/Gear/ Engineering	• Demonstration of recirculating systems in situ • Discharge systems flow through • Recirculating Aquaculture Systems – how can we make it work in Oregon?
Public/Consumer	• What is the social perception of aquaculture? (2) • Conduct research resulting in hard data – cuts through inaccurate perceptions. (2) • How can community support for aquaculture be generated?
Environment/ Ecology	• What is the ecological impact of aquaculture? • Is there space in the ocean environment for offshore aquaculture? • Conduct ocean mapping to determine the best places for commercial aquaculture ventures (2) • Fish disease/aquatic plant disease • Consider brackish, freshwater, and marine species – what are most viable and what locations should be considered? • Viability of open ocean aquaculture • Impacts on/of ocean acidification/hypoxia
Transdisciplinary	• Research that promotes aquaculture's cross-reference to other high interest topics, like vegetarian diets (for sea vegetables), carbon footprints, etc. • Polyculture – in this case merging terrestrial agriculture and aquaculture, or several species in an aquaculture setting, for mutual benefit (2) • Provide unbiased research about aquaculture (much current research is biased) • Research economically viable, ecologically healthy solutions for aquaculture ○ Low impact harvest
Business/Marketing/ Entrepreneurship	• Conduct market research into how to grow the market for wild-caught fish so that it is robust enough not to be threatened by a new aquaculture industry • Research how the supply chain would work – processing, marketing, distribution. • With limited budgets, what is the best use of the money in a wild ocean system?
Land-based aquaculture	• Explore opportunities to expand land-based aquaculture • Is land-based aquaculture a viable model? • Access to fresh water
Socioeconomics/ Demographics	• What are the barriers to entry?
Oregon-specific	• What are Oregon's opportunities (locations, types, marketing) for production and processing?

	• What kind of aquaculture can be successful in Oregon? • Can the hatchery be expanded in its focus?
Value-Added R&D	• What kinds of value-added products can be derived from aquaculture seafood?

What **education and curriculum needs** including **degrees/programs/courses** did the session reveal or highlight?

Topic	Comments
K-12	• Aquaculture taught in local schools
Program Structure/Possible Foci	• Learn from successful examples (such as algae) • Feed development – algae feed
Food Science and Technology/ Value-Added R&D	• Connecting food and culinary science to aquaculture products • Teaching students how to connect technology to the market and value-added process
Marketing/ Business	• Education/licensing support for domestic aquaculture rather than international • Marketing/branding aquaculture i.e., oyster products
Socioeconomics/ Demographics	• Opportunity for aquaculture to enhance economically challenged communities
Policy	• Local/State policy studies

Agriculture	• Aquaculture system degrees and programs (2)
	  ○ Especially in Oregon – specific areas like shellfish
	  ○ Take advantage of Oregon's agricultural heritage to connect students to aquaculture

Transdisciplinary	• Using scientific data and marketing (and maybe other disciplines) to address the public perception issues among students • Add seafood sustainability courses to degree programs outside of physical science programs • Site scouting, planning, permits/regulations

Infrastructure Needed at OSU	• Aquaculture test facility
	  ○ Techniques
	  ○ Various species
	  ○ Use for student training and public outreach

What types of **stakeholder training and outreach** did the session suggest?

Topic	Comments
Socioeconomics/ Demographics/ Communication/ Relationship Building	• Community buy-in • Community planning • Correct the stream of misinformation in OR communities • Address negative perceptions of aquaculture (2)

	• Building consumer confidence in aquaculture products to enable infrastructure development (2) • Alter consumer perceptions through trainings that demonstrate how aquaculture can beneficially impact their community • Public/consumer training about "good" aquaculture
Business/Marketing/ Entrepreneurship	• Incubator for new aquaculture entrepreneurs • Educate new businesses about Oregon fishing culture and history – try to help integrate businesses with the existing culture to mitigate political and cultural missteps • Marketing – aquaculture as part of the "seafood umbrella" • Add outreach/support for domestic aquaculture sales
The Role of the Center	• Trusted broker among different constituencies/stakeholders/communities.
Food Science and Technology/ Value-Added R&D	• Consumer education about how to best prepare different types of fish (e.g., farmed salmon vs. wild salmon) • Educating consumer palates to develop a taste for aquaculture seafood
Transdisciplinary	• Use of veterinary training to support aquacultural ventures • Existing uses cover every space in the ocean – how can different disciplines work together? • Develop micro-fishing (aquaculture) communities to support areas with less access to traditional local fisheries
Agriculture	• Explore aquaculture possibilities in 3D farming • Multi-purpose farming practices (not single-species and/or provides some ecosystem services)

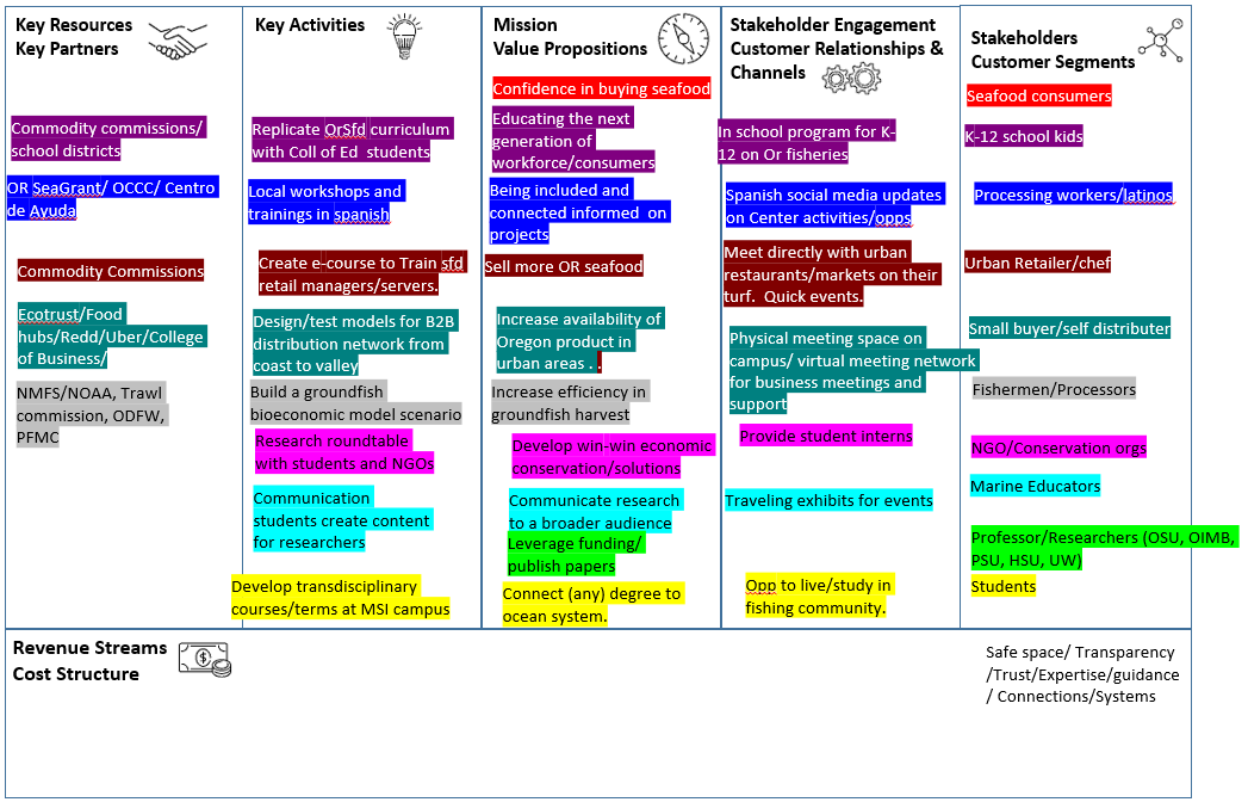
Other Issues

Topic	Comments
Transdisciplinary	• There is a market for addressing the aquaculture education/knowledge gap
Socioeconomics/ Demographics/ Communication/ Relationship Building	• Aquaculture brings the opportunity to feed more people
Marketing/ Business	• Partner with businesses with existing infrastructure (greenhouse nurseries, etc.) • Help brand all Oregon aquatic food products as being sustainable, healthy products that consumers can trust (2)
Misc.	• Abalone as a whole – bring it back to Oregon

Common Words (number of times mentioned in parenthesis)

- Viability (2)
- Consumers
- Confidence
- Policy
- Perceptions
    - Public Opinion
    - Public Perception
- Economics
- Culture
- Farming
- System
- Policy
- Politics
- Infrastructure
- Aquaponics
- Ecologically healthy
- Conversations
- Wild
- Support
- Research
- Education

World Café: Exploring a Business Model for an OSU Center for Seafood Systems and Innovation Summary:



Adapted from: Business Model Canvas, Strategyzer AG

Stakeholders	Stakeholder Engagement	Mission/Value Propositions	Key Activities	Key Resources and Partners
Seafood consumers		Confidence in buying seafood		
K-12 school kids	In-school program for K-12 on OR fisheries	Educating the next generation of workforce/consumers	Replicate OrSfd curriculum with Coll of Ed students	Commodity commissions/school districts
Processing workers/Latinos	Spanish social media updates on center activities/opps	Being included and connected/informed on projects	Local workshops and trainings in Spanish	OR SeaGrant/OCCC/ Centro de Ayuda
Urban retailer/chef	Meet directly with urban restaurants/markets on their	Sell more OR seafood. Increase availability of Oregon product in urban areas	Create e-course to train seafood retail	Commodity Commissions

	turf. Quick events		managers/servers	
Small buyer/self distributer	Physical meeting space on campus/ virtual meeting network for business meetings and support	Increase availability of Oregon product in urban areas	Design/test models for B2B distribution network from coast to valley	Ecotrust/Food hubs/ Redd/Uber/College of Business
Fisherman/processors		Increase efficiency in groundfish harvest	Build groundfish bioeconomic model scenario	NMFS/NOAA, trawl commission, ODFW, PFMC
NGO/conservation organizations	Provide student interns	Develop win-win economic/conservation solutions	Research roundtable with students and NGOs	
Marine educators	Traveling exhibits for events	Communicate research to a broader audience	Communication students create content for researchers	
Professor/researchers (OSU, OIMB, PSU, HSU, UW)		Leverage funding/publish papers		
Students	Opp to live/study in fishing community	Connect (any) degree to ocean system	Develop transdisciplinary courses/terms at MSI campus	

Complete Notes, Categorized (number of times mentioned in parenthesis)

Key Resources and Key Partners

Topic	Comments
Physical Assets-Needed	• Offices, meeting rooms, labs, a building or buildings • Connectivity (fiber for IT and telecom) – must be expandable to allow for growth • Shared/shareable resources (kiosks, berths for boats/ships, shared boats/ships and a system to manage them

Physical Assets – Have	• Entrepreneurial business incubator space
Human Resources	• Transdisciplinary • Economics • Thinkers • Collaborators • Social Media expert(s) • Variety • Up to 80 people directly connected to the center
Other	• Funding, university support

Who are the key partners that help the center with these resources or help create the services the center provides to those it serves? What do partners do for the center?

Topic	Comments
Key Partners	• Fishermen • Seafood Processors • Tribes • Other educational institutions • Community Colleges • Regulatory/Management Agencies • Government • Consumers
Key Partners Provide -	• Funding • Skills • Knowledge • Values • Technology • Opportunities for student to broaden their horizons through exposure to the seafood industry and networking with people from multiple disciplines

Look around you today. Who is here? Who is not but should be?

Topic	Comments
Present	• Commercial fishermen • Chambers of commerce • Business • Government • Seafood commodity commissions • Students (few)
Absent	• Tribal fishermen • Recreational fishermen • Business professionals • Population Dynamics

	• OSU School of Business • K-12 teachers • Restaurants • Fisher Poets • Ecotourism • Major foundations • Potential individual donors

Key Activities

What are the key activities that create the services the center provides? Think in four broad categories.

Research Projects

Topic	Comments
Fisheries/Fishing	• Stock Assessment (2) • SOP for different species
Regulatory and Management Issues	• Distributional effects of management and different fleet sectors • Assist with navigating land use conflicts • Policy/regulations impediments to aquaculture • Conduct surveys with NOAA and stakeholders
Food Science/ Value-Added R&D	• Effective use of byproducts
Aquaculture	• Polyculture
Business/Market Research	• Seafood agenda – developing a guideline for where we want to go with seafood • Grow the market for under-utilized species (address perceptions, do taste-testing)
Technology/ Gear/ Engineering	• Provide access to technology that fishermen can use for collaborative fishery research • Conduct research to improve gear (e.g., reducing whale entanglements)
Environment/ Ecology	• Species welfare assessments • Animal Husbandry

Education/Curriculum

Topic	Comments
Traditional University Education	• Bachelor's degree level – applied sciences • Courses in economics and law for college students studying marine areas

Stakeholder Education	• Center as broker for science • Center as broker for education
Continuing/ Vocational/ Technical/ Hands On Education	• 2-year technical programs • Apprenticeships • Hands on training (fileting fish, etc.)
K-12	• Aquaculture systems curriculum in these grades
Transdisciplinary	• Pull lessons from other food systems, other countries • Transdisciplinary curriculum – business, ecology, etc.
Center structure/ philosophy	• Innovation over old traditions – new ideas • Having boats and access to the ocean and coasts for students is the main asset of the center's location

Outreach and Engagement

Topic	Comments
Management/ Regulatory/ Policy	• Broker for education on rules and policy (legal)
Non-traditional delivery	• Online seminars for stakeholders
Targets for outreach	• Consumers and medical professionals—managing human health
Center structure/ philosophy	• Make advisory board with outside/varied chair people • Integrate services with Food Innovation Center – no redundancy • Cooperative research with stakeholders • If there is cooperation with industry at any level, need to present results in a publicly accessible way (e.g., layman's terms)
Collaborators	• Fishermen and all stakeholders

Business Development/Workforce Training

Topic	Comments
Food Science and Technology/ Value-Added R&D	• New uses for waste (like at Iceland Cluster)
Business/Marketing/ Entrepreneurship	• Need focus on business, incubator, accelerator focus
Law	• Provide access to business and legal skills for fishermen
Aquaculture	• Training network support for aquaponics
Continuing/ Vocational/	• Leverage and incentivize apprenticeships

Technical/ Hands On Education	

What specific projects or programs would be most relevant to helping you do your work?

Topic	Comments
Transdisciplinary	• Agriculture and forestry are very well integrated – not so with marine products/seafood and agriculture
Center structure/ philosophy	• Conduct research into effective use of existing resources – e.g., seafood byproduct research in Astoria, OCCC for Aquarium Sciences • A clear definition of roles between Astoria and Newport would be helpful. How can Astoria help support programs in Newport? • Get away from research, education, and outreach model – it's too separated • Have different facilities focus on food and non-food uses for seafood

Mission/Value Proposition

How does the center help those it intends to serve?

Topic	Comments
Center structure/ philosophy	• Engaged partnerships with industry – incorporate them into research in applied ways • Innovation
Outreach	• Educate the public about seafood systems – encourage systems thinking • Educate about value added products

In your own work, does the center's work help you get your job done better?

Topic	Comments

Workforce training	• Industry-ready employees
	• Workforce enhancement/strengthening, particularly in:
	  ○ Technology fields
	  ○ Workflow engineers
	  ○ Commercialization of innovative products

Center structure/ philosophy	• Synthesize information about things that scientific researchers may not know (e.g., social science areas) • Bring in diverse expertise from the US and abroad • Support international advocacy

Write future headlines for your favorite trade magazine/publication's cover about a success the center became famous for.

Topic	Comments
Seafood	• Oregonians live longer because of healthy seafood consumption • OSU Center streamlines seafood from boat to plate • OSU seafood center lays out strategy for 50 by 50 (50% domestic seafood consumption in the US by 2050)
Aquaculture	• Aquaculture keeps Pacific Seafood plants open and maximizes economic and health benefits • Guns no longer needed to guard net pens

In your community, and with those that are underserved or underrepresented, what value could the center provide?

Topic	Comments
Fishing/Fisheries	• Education on value of history in fisheries ○ Built over time to set goals for future – can't make the same mistakes again
Center structure/ philosophy	• Provides accurate, usable, and well-communicated information

Stakeholder Engagement/Customer Relationships and Channels

In your own work, how do you want to be connected to and engaged with the center?

Topic	Comments
Communication/ Outreach Strategies	• Regular newsletters • In-person outreach • Social Media • Traveling outreach – don't expect stakeholders to come to you • Host events involving discussion, not just lectures • Go into the community – go to the fishermen
Center structure/ philosophy	• Revitalize the Astoria Seafood Consumer Center • Engage in research, marketing, and outreach

What are important best-practices that a new center could use to involve all stakeholders and audiences in research, training, and outreach and engagement?

Topic	Comments
Communication/ Outreach Strategies	• Ensure that outreach is equitable • Provide remote engagement for rural communities (e.g., conference calls, Web conferencing)

	• Newsletter • Increase access to research results/articles/research • Provide engagement and education for stakeholders • Make research results accessible to laypeople • Create online communication forums to engage/share information • Use modern technology, such as social media (webinars, live Tweeting), to share research and engage stakeholders
Center structure/ philosophy	• Braintrust (hub for ideas and communication among stakeholder groups) • Facilitate transparency and communication among stakeholder groups • Keep the community (fishermen, managers, etc.)

Student Engagement	• Students as community ambassadors
	  o Will be able to take "Boots on the ground" courses with industry
	  o Travel along coast exploring different aspects of industry
	  o Student liaisons for commission meetings, etc.

Continuing/ Vocational/ Technical/Hands On Education	• Provide workforce training for fishermen, industry, and students o Bolster future workforce
Collaborative Research	• Engage stakeholders at the beginning of the research process • Ensure research relevance to community being "served" • Collaborate with the community • Ensure that there are incentives for stakeholder investment in research • Link fishermen with scientists – utilize fishermen to help collect data o The incentive for investment is an end product that the fishermen are able to use that benefits them • Ensure that research done for the benefit of a community or stakeholder group is then applied so they can see the results

Common Words (number of times mentioned in parenthesis)

- Consumer (5)
- Marketing (2)
  - Related words
    - Story
    - Market
    - New Markets
    - Public Perception
    - Marketability
- Sustainability (2)
- Trust (2)
- Consistency (2)
- Connecting/Connect
- Cross-pollination/cross-fertilization
- Boat to school

- Streamline
- Big data
- Dynamic
- Team experiential experiences
- Farmer's markets for seafood
- Incentives
- Poor management
- Cooperation
- Products
- Supply
- Education
- Habitat
- Dover Sole
- Wild
- Innovation
- Regulation
- Costs
- Value
- Demand

Final Wrap Up Session

Complete Notes, Categorized (number of times mentioned in parenthesis)

Big Questions

Topic	Comments
Location/Physical Structure	• Where is the center going to be located? • Is it virtual? • Is it decentralized? • How does the center fit within the Marine Studies Initiative and its new building?
Funding	• Does this center benefit from Marine Studies Initiative resources and OSU support?
Geographical focus	• Oregon? • International? • What scale will the center work on? Local, regional, national, international?
Temporal focus	• Goal is for this to exist long-term, serving education and industry into the future • Ensure that the center has short and long term strategies-be intentional
Strategic	• What is the scope of the center's work? • Continue to ask the question *why* throughout the planning process and the life of the center • Intend that the center is integrative and transdisciplinary

Main Take Aways

Topic	Comments
Funding	• To get big money, ask big questions
Center Structure/ Philosophy	• What does this center stand for? What is its mission? What gaps is it trying to fill? • Workshop participants are on the same page about working together – it is a valuable challenge to keep this idea going
Presentation	• Use visuals – diagrams, pictures, videos to support education and programs

Ideas/Suggestions

Topic	Comments
Education	• Two-way education and engagement among stakeholder groups and the university • Interdepartmental/transdisciplinary learning

Scope/Geography/ Growth	• Connecting different institutes in different states • Replicate model to other states via Sea Grants • Fishery management planning for other countries
Promotional Ideas	• More visual • Terms – Nexus, node • Conjure up imagery • Use language that is meaningful and understood by specific audiences
Center Structure/ Philosophy	• Look worldwide for examples of how the center could be structured
Center Staff Development	• Staff development for how to incorporate input from stakeholders into the center's work

What did we miss?

Topic	Comments
Environmental	• Consider values that improve the productivity of ecosystems (ecosystem services)
Transdisciplinary	• Don't create another seafood echo chamber – consider how seafood fits into the larger food system
Branding	• Clear definitions of our terms – center, initiative, support, institute

What and who are we missing?

Topic	Comments
Socioeconomics/ Demographics/ Communication/ Relationship Building	• Tribal entities • Latinx community • Fish reliant communities
Fishing community	• Include more fishermen – small boats • Sport fishermen
Regulatory/Gov't Agencies	• Outside the box federal and state agencies, such as business development and other unlikely partners • Port districts • Local government • Fishing/Seafood related state and federal agencies (e.g., DEQ, FDA, OSHA, ODA, NOAA) • Law enforcement (USCG, DOD)
NGO's	• Nearshore partners – Southern Oregon Ocean Resource Coalition (SOORC), and FINE, and FACT • Environmental NGOs • Non-profits that represent fishing groups • Trade organizations

Educational sectors	• Community colleges • High School students • Public Health
Seafood industry	• Retailers/Food Service/Restaurants /Institutional buyers that serve underserved communities • Processing line workers
Technology/Gear/ Engineering	• Technology – "thinkers" in the tech world
Funding	• Funders
Aquaculture	• Better representation from the aquaculture industry
Community Partners	• Tourism • Media • Chambers of commerce

Overarching Themes

Topic	Comments
Educational sectors	• Experiential learning, internships • Professional development • Public outreach education • K-12
Business/Marketing/ Entrepreneurship	• Explore the challenges in commercializing good ideas • Business and entrepreneurship education for people working throughout seafood systems • Conduct marketing research and data analysis • Telling the stories of the seafood community • Evaluate consumer perceptions vs. behavior • Cut through perceptions with hard data • Build consumer confidence to grow support for infrastructure development
Economics	• Conduct economic analysis • Creating market demand
Technology	• Training, education, and exposure for students and stakeholders • Develop tools to gauge and analyze opportunity – what type of fish is most plentiful and where?
Food Science and Technology/ Value-Added R&D	• Trust the seafood – ensure excellent food safety • Conduct R&D to explore alternative uses for seafood processing "waste" • Food Science
Transdisciplinary focus	• Cross-fertilization across disciplines • Interdisciplinary education/training • Include social science/human dimensions • How to instill good communication in scientists

	• Ethics • Psychology
Regulatory and Management Issues	• Explore flexibility in regulations
Consumer/ Public	• Research consumer needs and demands • Raise consumer awareness of seafood • Increase community engagement
Role of the Center	• Be a bridge between different stakeholder groups – build connections • Provide access to timely, necessary science • Cooperative research
Aquaculture	• Consider as complimentary with "wild caught" • Connect students with aquaculture – put in the same category of Oregon and Northwest positive agriculture reputation • Demonstrate how aquaculture can benefit communities
Fishing/Fisheries	• Equity, Recognition, Reputation • Natural mortality (esp. re: Dungeness Crab)
Environment/ Ecology	• Effects of environmental changes on fisheries/seafood
Challenges and Opportunities	• Lack of infrastructure (2) • Modeling (bioeconomic, other) • Trust (2) • Engagement • Uncertainty