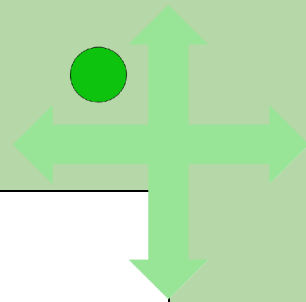


Plenary: Regional Impacts of Fortune and Favor



*What aspects of this scenario are particularly relevant for **Northern California**?*

- N Ca between warm and cold water producing high variability.
- Impact of weather as evidenced by fires. Particular impact on salmon but sediment runoff could affect species in the marine environment.
-

*What parts of fishing or specific communities in **Northern California** might be most affected by developments in this scenario?*

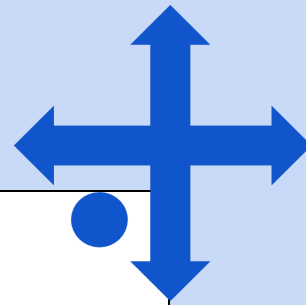
- The small vessel fleet is declining for a variety of reasons due to consolidation of buyers (evident in D. crab fishery). This connects to specific communities.
- Shrinking of fleets is not confined to small boat fleet.
- Loss of infrastructure; competition among coastal uses (tourism businesses edge fishing related businesses). A warming climate could drive an increase in these nonfishing uses on the N CA coast.
- The biggest cold storage plant in N CA closed in 2008; an example of being challenged by infrastructure loss.
- The Coastal Commission is a very important player in determining coastal dependent uses.
- Range shifts are not accompanied by the ability to open and close fisheries in response. A community doesn't get any benefit from the availability of such a stock. Particular impact on small vessel fleet.
- Decline of small boat fishery may be due to management policies
- (Potential) Competition with renewable energy facilities [more relevant to Blue Revolution but it is already happening in our region]
- Growing interest in local seafood
- This scenario may make commercial fishing more attractive to new participants. Currently there are high barriers to entry including costs (permits, vessels) and social preference for "white collar" or service sector jobs.
- Similarly, recreational fisheries participation could grow with increase in species abundance coupled with social desire for more interactions with the environment.
- There could be a positive tipping point, coupling the eat local preference and related recreational fishery growth
- Higher variability has resulted in fewer buyers conflicting with variability in fishery participation. People enter the fishery in good years but when things go down prices decline forcing people out of the fishery.
- Fishery consolidation could work against a buy local trend.

*What specific storylines could you imagine happening in this scenario in **Northern California**?*

- We experienced a northern shift of CPS a few years ago and the infrastructure in nearby ports wasn't there including offloading facilities and roads inadequate to trucks hauling fish from isolated ports. Increase in commercial fishing also coincided with increased tourism.
-



Plenary: Regional Impacts of Blue Revolution



*What aspects of this scenario are particularly relevant for **Northern California**?*

- There will be a need to tap into new data streams to facilitate spatial management of ocean uses. The energy sector has much more financial clout than the fishery sector so there will be a need for collaboration in this regard (and in arriving at beneficial outcomes).
-

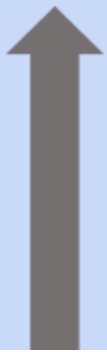
*What parts of fishing or specific communities in **Northern California** might be most affected by developments in this scenario?*

- How does the Department of Commerce support the fishing fleet in the face of expanded ocean uses for energy and aquaculture? (This support needs to be from a higher level than the Council.)

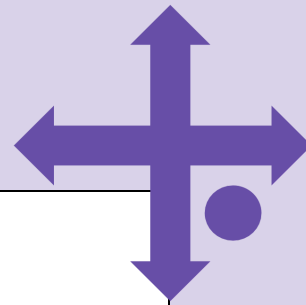
*What specific storylines could you imagine happening in this scenario in **Northern California**?*

- Wind power happening now with potential siting on fishing grounds. This includes the laying of submarine cables. The permitting process has not adequately addressed these impacts. Fishing community concerns are being disregarded.
- This is the direction we are heading in N. California.
- Aquaculture could expand as an ocean use as well.
- The development of a mixed use plan for ocean use similar to terrestrial plans is needed
- D. crab task force is an example of what will be needed when protected species are concentrated in certain areas and interactions with fisheries increase.
- Non target species impacts: will burden fishing communities and fishery managers with task of developing more dynamic management responses. Will we have the capacity to do that, especially in a fast changing situation?
- MPA (NMS) management -
 - regulatory framework focuses on habitat protection. Alternative energy platforms are prohibited in many of the west coast sanctuaries (may be allowed in some in limited circumstances).
 - consider resiliency of top level predators including promoting forage fish protections. This could also benefit fishing communities

- More effective tools and processes to make siting decisions. So far [NMFS] aquaculture has done a much better job than energy regulators (BOEM).
- Fishing associations are mapping generic fishing grounds. (Current characterization of fishing grounds is not accurate.)
- Critical to think about the change in fishing grounds in relation to other (future) ocean uses?



Plenary: Regional Impacts of Hollowed Out



*What aspects of this scenario are particularly relevant for **Northern California**?*

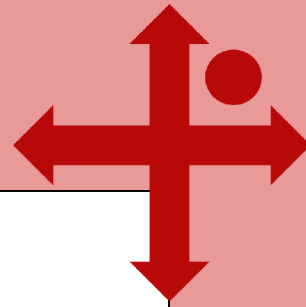
*What parts of fishing or specific communities in **Northern California** might be most affected by developments in this scenario?*

- Potential loss of fishing leads to the growth of non water dependent coastal uses. It will not be possible to get that space back for fishery/water dependent uses.
- Severe weather and tidal influx will force the relocation of coastal infrastructure especially for small boat fleet
- Could offshore development provide benefits to coastal communities as far as fishery related infrastructure? Are there common interests in this regard that could be leveraged?
- A significant shift in how coastal communities are supported. For example Bodega Bay and ... would get more support from other economic activities. Shift from “fishing community” to “coastal community.”
- Recognize that all fishery sectors share common interests, especially when it comes to infrastructure. (For example, lobbying Congress for support in this regard.)
- Could offshore development benefit fisheries/fishing communities? So far mitigation programs have been problematic, varied among fishing communities. The example is submarine cable mitigation in terms of revenue stream directed to particular users. Skeptical that non water dependent uses are going to support fisheries/communities/infrastructure.
- Fishing communities need their self sustaining social capital.
- If there is a high variability in fishing it will be hard to maintain fishing related infrastructure. There will likely be need for government support when there is less steady revenue from fishing.
- Monitoring of product quality
- Need for mentoring programs to support new entrants.

*What specific storylines could you imagine happening in this scenario in **Northern California**?*

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Plenary: Regional Impacts of Box of Chocolates



*What aspects of this scenario are particularly relevant for **Northern California**?*

*What parts of fishing or specific communities in **Northern California** might be most affected by developments in this scenario?*

*What specific storylines could you imagine happening in this scenario in **Northern California**?*

- The salmon industry provides a good example of conditions under this scenario, looking back at 2018. The salmon fleet was concentrated in Morro Bay, which hadn't seen that many boats in a long time. Since then the salmon have moved north. The point is, fleets will have a wide range of fishing areas and as they move, the ports will need to have the facility for periodic influx of vessels. Port managers will need to have a longer term view in terms of the level of infrastructure.
- This scenario mimics the 1982-83 El nino in N. California. Many southern species appeared in the region. Fishermen could do little in terms of accessing markets for these species that appeared. A scramble to try to figure out how to capitalize on these conditions.
- Challenges to processors and buyers dealing with new species, increased costs will be reflected in lower prices offered to fishermen
- A recent example of having tuna unexpectedly appearing off Morro Bay. Not all fishermen could take advantage of that.
- A need for public investment in monitoring to have a better idea where species are.
- Bringing back the catch of the day concept to capitalize on more variable availability. Need connections throughout the community to address this. Could involve more local, flexible marketing.
- Technology increases the odds of success in fishing. Currently available technology for environmental monitoring by fishermen to predict where the fish are. Are there lower cost vessel monitoring systems? Development of common technology standards and platforms to lower cost. Opportunities to innovate in vessel monitoring to lower costs.
- Temper some optimism around variability especially in regards to HMS due to international management framework.

- Need for interjurisdictional/transboundary management arrangements. Although N CA is “in the middle” these issues will affect adjacent areas with downstream effects on our area. If the “ends” aren’t taken care of, our area will see greater pressure, for example due to vessels from those adjacent areas moving into our region.



Breakout 1: Implications for communities in Northern California

For each scenario:

- 1. What will communities in Northern California be most concerned about?*
- 2. What's happening that provides a potential upside for communities in Northern California?*

FORTUNE AND FAVOR

Question 1: What will communities in Northern California be most concerned about?

- societal values; moving away from globalization i.e local squid fisheries being impacted by climate variability
- current concerns of the unknown, year to year uncertainty
- there is a problem in gaining support and organizing fisherman themselves into common interest pools and organizing communities to engage the political process given the scale of the northern california region
- Need for mentorship of new participants and need for infrastructure to support
- Potential conflict in increased participation of commercial and recreational
- Support for local fishing can be enhanced by local markets which are not an easy programs which are difficult to establish. Direct market programs require a lot of effort initially and to maintain.
- Where and how will the fisheries leaders be developed and/or emerge. The fleet needs leaders to represent interests

BOX OF CHOCOLATES

Question 1: What will communities in Northern California be most concerned about?

- In smaller coastal communities the infrastructure to get fish to market where roads, transportation are challenging can be hampered by insufficient infrastructure
- Need for consistency in markets and the yearly variability will make this difficult
- New species that are available may not have markets which will require more adaptability
- Need to promote and utilize other species as they become available
- Technology will need to improve in order to be more nimble, adaptive, and creative. Proper investment in data collection to add to nimbleness
- Need for more flexible management to allow for industry to take advantage of new opportunities
- Marketing efforts need to increase including buyers, restaurants by educating consumers on new products.
- Challenge for processors on how to train staff given changing species

- Gentrification and how to continue allow access for people to go fishing and support current coastal communities and fishing infrastructure.
- Shifting stocks and protected species (i.e. salmon) will continue to be an issue

Question 2: *What's happening that provides a potential upside for communities in Northern California?*

- increase in support of local economy and purchasing local seafood
- Smaller communities are more connected to local economic features in their communities
- Could make commercial fishing for attractive to new participants
- Currently in a technology revolution and fisheries are using technology including NOAA data modernization platform allowing data to be more real time. This will allow for more data that can be used to create more nimble management
- More collaboration and co-management (at the local level) harvesters use of technology will allow more data in the public domain and thus more transparent
- Interest in local seafood means local governments will be more interested in supporting industry as well as interest in the development of new technologies
- CA Coastal act has protective language to protect fishing critical features
- Poised to benefit from shifting stocks as long as there is flexibility

- If wild fisheries are more variable than there is a concern to lose markets to more consistent products like aquaculture and manufactured proteins

Question 2: *What's happening that provides a potential upside for communities in Northern California?*

- Partnerships and learning opportunities between the fishing community and ag community to learn how to deal with variability
- Wild capture seafood could be marketed as more high-end as a market niche given low volume

THEMES:

- Solution:
 - Organizations (community and regional) are going to be needed to facilitate communication, supply leaders, and work with political entities. The broader the organization can be the better though this is a tall ask. More inclusivity with regards to fishery issues the better and will help industry and individuals be more resilient.
 - Seafood marketing will be critical across all the scenarios
 - Industry needs to be well organized and have strong voice and coordination. These scenarios will result in potential increased division between sectors and therefore organization and coordination is critical to prepare for these scenarios.



- Flexibility to deal with uncertainty. Including flexibility in management, infrastructure, markets, etc. Nimbleness and quickness in the management process (Council, state management, etc) to allow for timely responses.
- Being more **responsive** rather than **reactive**.
-

BLUE REVOLUTION

Question 1: *What will communities in Northern California be most concerned about?*

- Spatial conflicts (open ocean) between aquaculture, offshore energy, and fisheries
- Energy and aquaculture sectors are well organized and how do fisheries counteract, given the public outreach and the money of the energy and aquaculture sectors
- On a cultural level there is more separation again through spatial conflicts creating an “us vs them” divide
- Not sacrificing MSA
- Not losing the cultural history and skills associated with fishing and fishing communities both the knowledge and the skill sets are not lost and are available in the future
- Potential loss of fishing communities and jobs
- Alternative livelihood in fisheries where members might need to diversify in order to maintain
- If larger commercial operations are pushed out than there will be a loss of infrastructure for smaller vessels
- Potential negative impacts to habitats due to offshore aquaculture and energy installations

HOLLOWED OUT

Question 1: *What will communities in Northern California be most concerned about?*

- Few stocks remain at harvestable levels
- Survival mode given the dire conditions which does not bode well for data sharing, collaboration, co-management, etc.
- New development of land based aquaculture which will outcompete wild fisheries
- Coastal infrastructure will not support fishing activities and access and coastal infrastructure will be at risk from inundation and erosion
- Losing the cultural history and skills associated with fishing and fishing communities both the knowledge and the skill sets. Ensuring that they are not lost and are available in the future
- Harbors and fishing activities will need to migrate based on conditions

Question 2: *What’s happening that provides a potential upside for communities in Northern California?*

- If all the collaborators build a foundation that there is less of a breakdown given this scenario. This is the strongest incentive to build the most resilient

- Impacts to harbors and infrastructure to be dominated by offshore energy/aquaculture and this could change the community identity (i.e. Morro Bay)
- As stocks and effort move harbors and communities may not have the infrastructure to accommodate shifting stocks

Question 2: What's happening that provides a potential upside for communities in Northern California?

- RODA west coast chapter will emerge as an opportunity and voice for west coast fisheries
- Potential shifts between industry (fishing, aquaculture, offshore energy) jobs
- Increase in jobs potentially as a whole for the coastal community
- Alternative livelihood in fisheries where members might need to diversify in order to maintain
- "Rigs to Reef" might be a potential plus allowing more recreational activities

management and community systems to prepare for this scenario.

- New development of land based aquaculture allowing for continued seafood

Breakout 1: Implications for Harvesters in Northern California

For each scenario:

- 1. What will Northern California Harvesters be most concerned about?*
- 2. What's happening that provides a potential upside for Northern California Harvesters?*

Challenges:

- Challenges to supply chain
- Scale of access to resources in the face of changing abundance. Cases where small scale fishermen could take advantage but it would be problematic if larger scale operations exploited a resource that may be temporarily available.
- Management based on BSIA may lag the appearance of new species. Wrestling match between desire for access and precautionary management.
- Lack of human resources to analyze the data on newly emerging conditions. Need to recruit new/more talent.
- Careers in fishing have to be lucrative and viable. Harder to achieve that in an unstable environment. Linked to the need for the flexibility to capitalize on available stocks.
- While demand for seafood could increase, the challenge will be at what price point? Will domestic fishermen be able to compete?
- Who's going to teach new fishermen about stewardship?
- Costs will keep going up making it hard to get into a fishery.

Concerns:

- If offshore development is a factor, greater periodic abundance could increase conflicts among ocean uses.
- What if there is a boom year overlapping with a situation where more whales are around? Likely to be more tricky situations.
- Market responsiveness and flexibility -- lots of fish but no market or no port infrastructure.
- Science will be much more difficult -- hard to gather real time data about current status of the environment.
- With a lot of boom and bust cycles there will be more costs to fishing operations (& other elements in the supply chain).
- What are the social priorities for different species? i.e., conflicts between fisheries and protected species. Where is the balance? -- Have to factor in the changing abundance of protected species=whales, etc.
- Scientists/managers need to be more open to accepting data from the fishing sector. Need for rapid assessment. Fishermen will need to be willing to share data and managers willing to use that data.

Upside:

- New entrants will need to learn how to participate in the management process to influence their fishery.
- Look at all these challenges in this more positive scenario! A lot of these concerns apply to all four scenarios -- especially the theme of flexibility.
- Interjurisdictional issues between No. CA and OR.

Upside:

- With range shifts if there is a mechanism to allow fishermen and managers to allow fishing on those stocks, it would be a benefit [permit flexibility]
- Local access to new stocks depending on what barriers in place. (Barriers have been traditionally how to ensure stock sustainability)
- At least things wouldn't get worse! Things aren't changing from what we're experiencing today (we'll know what to expect).
- Flexibility will be especially important in this scenario to realize the benefits under this scenario. If variability is not extreme, it will be easier to come up with solutions, especially if we're not simultaneously dealing with other serious problems.
- Ecosystem abundance could encourage more fishery participation and more consumption of ocean protein (health benefits for society). Enhance public perception of fisheries too.
- Non traditional distribution models would flourish, better compete against traditional marketing approaches.
- Greater dialog between fishermen and fishery managers.
-

- If new technology is developed maybe some of it lowers costs.
- Environmental monitoring equipment could help fishermen to keep track of stock availability so they can be less frantic about jumping on new stocks.
- Technology to track abundance could allow rapid reallocation of fishing opportunities. But the technology needs to be coupled with responsive, flexible management.
- Even in the next 5 years the situation with salmon and yelloweye rockfish will push for flexibility.

Concerns/challenges:

- Aquaculture impacts including facility discharges and competition with wild fish. Potentially more competition from local aquaculture operations.
- Loss of fishing grounds to other marine uses. Right now it's submarine cables but could be other activities in the future.
- If you are losing "normal" species and seeing new species you may have a harder time keeping the market, especially locally.
- Squid harvesters have demonstrated flexibility in terms of capacity to offload product in different ports. That fleet adapts well because the squid resource can be quite mobile.
- Depressed ex-vessel pricing across the board due to consolidation among buyers.
- The bigger boats (>40 ft) have a capacity to follow the fish, which the smaller vessels can't do. That portion of the fleet would disappear.
- You're not going to build a new fleet regionally; rather vessels will relocate. While there will be stocks available for local vessels, they could get crowded out at the dock by transplanted vessels. (The size and mobility of different vessels is a factor.)
- Don't think we're doing ourselves any favors if we replace fishing with renewable energy generation.
- Lack of commercial fisheries representation will impact the relative mix of ocean uses.

Challenges:

- More frequent/severe storms will prevent vessels from getting in and out of harbors. It's already a problem and will get worse. (Santa Cruz, HMB). Funding needed to upgrade infrastructure.
- Bridging fisheries, need to pivot among stocks,
- Harbor dredging requires certain permits and can only occur at certain times of year -- need to bring together multiple agencies and breaking away from the niches we each work in.
- Loss of recreational fishing will also impact maintenance of harbor infrastructure.
- Loss of community fabric as many aspects fall away.
- Looking at the North Coast from a statewide perspective, will there be a decision to reallocate limited resources to maintain infrastructure in other areas. And this could pit communities against each other

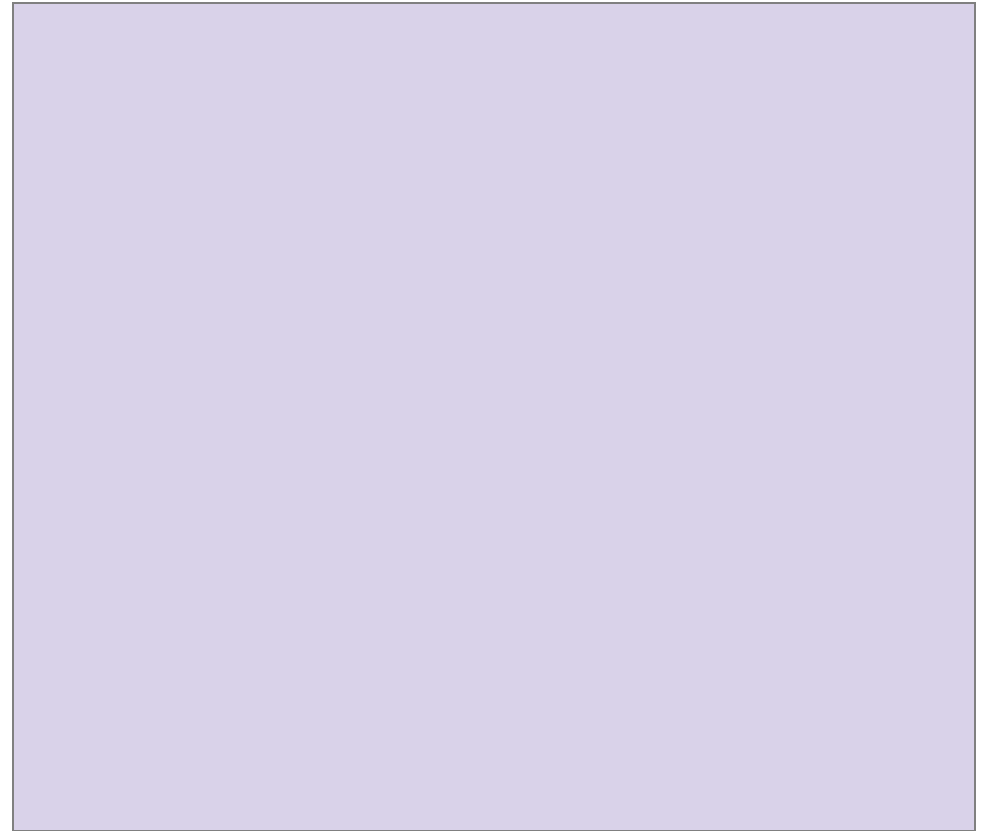
Upside:

- Motivate greater collaboration among local/state/federal agencies
- Example of fisheries sustainability plan for Eureka -- one outcome was recognition of the lack of social capital, meaning the connection with the greater community to solve problems. Most fishing ports don't have that. Made worse due to lack of interactions.

- Squid is a good example of stock shift where landings are not being made by local boats. There's not going to be a local fishery on shifting stocks without support.
- We don't have a seat at the table for fishermen to engage in the decisions about wind energy facility siting. Contrasts to the tools developed for aquaculture siting. Who do we have to convince to get a similar tool for other ocean uses?

Potential upside:

- More variation in species added to the local market base. Covid situation shows possibility of direct sales locally.
- Pressure from competing users could motivate fishermen to unite to educate and advocate.
- Another lesson from covid is people's interest in cooking at home and trying new products presents new possibilities.
- Possibly more consistent supply of squid and albacore.



Breakout 1: Implications for fishery managers in Northern California

For each scenario:

- 1. What will fishery managers be most concerned about?*
- 2. What's happening that provides a potential upside for fishery managers?*

Question 1:

- Infrastructure as well as management structure may not be in place for handling species range shifts
- Changes to modeling information and understanding of what is sustainable (OA, ecosystem, food web). How will this affect harvest limits
- Migration of labor or mechanism needed to transfer permits (transferability processes for some permits, not all)
- Need for fishing gear, as well as monitoring adaptability
- Ability to identify ahead of time, the connectivity of critical habitats for various life stages of prey & predator species
- With info we have now, we are better able to predict major shifts (e.g. marine heatwaves). Emphasis on being able to model & predict these. Management should be more proactive in reading these major shifts, and better able to use the research tools that are there.
- Being able to have sampling in place for range shifts, and having the fleet ready to assist with sampling.

Question 1:

- Concerns could span all of the concerns listed for the three other scenarios
- Infrastructure as well as management structure may not be in place for handling species range shifts
- Workload - have to expand or broaden the amount of agencies who are involved with crossover issues.
- How do we allow more opportunity/educate new fishers when there is restricted access in place?
- How does management and society keep the fishing culture alive?

Question 2:

- Emerging technologies/advancements could help managers

Question 2:

- More players in the game, more interest in being involved and invested in the future of sustainable fishing (helps managers get the info they need)

Question 1:

- Workload - have to expand or broaden the amount of agencies who are involved with crossover issues.
- The mismatch and siloed conversations between agencies and stakeholders.
- Two national marine sanctuaries in nor Cal. Both older, and have strong regulations against disturbance. Only Congress has the ability to change regulations.
- Challenge for managers to determine regulatory what/where/who (what agency)
- Aquaculture is a complex matchup of interests. Tricky for management bc of established fishing grounds and difficulty sharing that info (due to confidentiality). Investment from afar, unfamiliarity with the area and its issues.

Question 2:

- More competition could push more interest/investment
- Conflicting interests are not insurmountable, it's doable, just takes planning. (e.g. sanctuaries are cognizant of maritime history and value of fishing history)
- All parties are interested in planning for the future

Question 1:

- Changes to modeling information and understanding of what is sustainable (OA, ecosystem, food web). How will this affect harvest limits. More resources needed for this
- The mismatch and siloed conversations between agencies and stakeholders.
- How do we handle severely reduced or recovering fisheries (from a management perspective). How do we ensure sustainability
- Does management's role become solely a disaster relief role?
- How does management and society keep the fishing culture alive?

Question 2:

- Ecosystem based management - where do we fit in to improve the ecosystem broadly.
- Potential increase in invertebrate fisheries

- More attention/investment in good science bc of the realization that it is now more important than ever.



Breakout 2: Potential actions for communities in Northern California

For each scenario:

*If you knew this scenario was going to be the future, what should communities do now? (i.e. identify **actions** to prepare for this situation, to ensure it happens, or to avoid it happening)*

- [answer fortune and favor]
- More social capital and organizations
- Build higher level support in the department of commerce (start with local representation engagement). Including more funding etc.
- Need to allocate funds to a diversified portfolio of fisheries
- Small business stimulus to have scientists work with new fisheries (SK funds currently works towards this goal)
- Infusion of funds and people for habitat restoration (i.e. for salmon interests) need for cultural shift for leadership shift to address salmon issues (death by a thousand cuts)
- Port infrastructure is a long term issue and needs to be addressed by specific components to identify which pieces are critical and fisheries specific activities that would need to have funding generated to maintain (potentially employ similar strategies as AG).
- Create a real time notification for port access
- Ice infrastructure requires large investment and maintenance with a feedback loop with fisheries (no

- [answer box of chocolates]
- Fishermen and ports have easy access to diverse portfolios
- Diversification of portfolios includes
 - choosing between different fisheries (permits)
 - market development
 - infrastructure
 - increase information on availability (i.e. app)
- Data will be critical as well and allow for fishery to take advantage of opportunity and meet conservation goals. Real-time data and technology will allow managers to be more nimble.
 - Advancing data limited models and technology through investment to develop and increase the acceptance of these methods for making management decisions
- More collaboration between fishing ports with regards to collaboration between fisheries, managers, NGOs, etc. This could be promoted through cultural shifts as well as providing opportunities for different groups together through set aside funding, processes, and policies to promote this collaboration.


ice no fishing, no fishing no ice) and keeping access to this infrastructure

- Healthy fish stocks, infrastructure, markets, diversity of fisheries and gear types, supportive environment (government, community partners, etc.) are all dependent on each other.
 - Healthy Fish Stocks and habitat: Effective management, Local stewardship
 - Access: Fishing rights, Fishing grounds
 - Infrastructure: Ice, Fuel, Hoists, Storage, Processors, Mix of businesses
 - Markets: Diversity, Choice
 - Diversity: Fisheries, Gear types (at ports and for individual fishing businesses)
 - Supportive Environment: Government, Consumers, Community partners, Lenders/Business support
- Robust data collection so that fishing communities and fishermen can be more proactive in responses on what is needed to take advantage of future opportunities. Data also allows for conservation goals to be met given variability. With more data, managers will be able to be more confident in decisions.
- Different management mechanisms need a way to account for real time data streams and be able to adjust in a more timely manner.
- To take advantage of local availability potentially have a set aside to allow for opportunities to a broader group (example adaptive management trawl IQ program)

- Key ways to get flexibility can require long timelines to get implemented
- Way to promote and allow more access for fish destined for human consumption within an FMP as a set aside

- [answer blue revolution]
- With regards to new species, acquire more information and data on how they interact with current species and create a better understanding of the fishery implications from these range shifts
- Efforts needed to engage fishery stakeholders and management that has supported fishery stakeholders and involve stakeholders in the process to thoughtfully engage relationships. Involve communities in addition to fishermen in this process as offshore development is considered.
- Fishermen would have the potential to diversify businesses by taking advantage of other opportunities provided by offshore energy and aquaculture. Building relationships between offshore investors and the fishing industry early in the process to foster local community involvement. An example of fishermen collecting data for wind farms: David Bethoney and his organization is the Commercial Fisheries Research Foundation <http://www.cfrfoundation.org/>
- Ensuring the fishing community and other stakeholders are part of these regulatory processes as these new developments move forward to ensure representation.
-

- [answer hollowed out]
- Build resiliency in remaining fisheries that can function in this scenario and that they are as strong as possible with regards to the needed markets and infrastructure that these fisheries depend upon.
- Marketing is essential to make the most from anything that is able to be brought into the market.
- Science and data collection are essential to be able to make the most of any potential opportunities.
- Boutique fisheries (due to low quotas) that are permitted could institute a lottery so that expectations are set in advance so that participants can plan accordingly.
- Help to diversify fishery portfolios for business (permitting, financing to diversify permits, etc.) as well as diversifying ports
- Ensuring that there is equity to ensure that the benefits from the small number of opportunities are distributed
- Create a pathway to engaging legislators, and create multiple alliances to promote fishery and coastal community needs
- Fishing community needs to actively engage with new CA state senator on fishery issues and create have established groups to promote and lobby for the CA



fisheries and coastal communities(need to better organized as an industry to have better representation)

- do we care who has access to fish

- Need for more organizations that provide resources similar to the AG sector
- Required and funded coastal management and fisheries implementation
- Coastal communities and fishing communities though connected are different

Breakout 2: Potential actions for Harvesters in Northern California

For each scenario:

*If you knew this scenario was going to be the future, what should harvesters do now? (i.e. identify **actions** to prepare for this situation, to ensure it happens, or to avoid it happening)*

- Be prepared for range shifts: Southern California stocks appear more consistently in the area. How do gain access to them given management “boxes”? [applicable to all four scenarios]
- 3 options for individual response [also applicable across scenarios]
 - Identify new opportunities in invest gear for those
 - Move boat to more productive waters based on my knowledge
 - Sell out an retire
- Figure out how to sell directly from the boat, embracing social media to find new marketing paths
- Given constant production (compared to others) so best place to improve infrastructure, which is a gap in N. CA.
- In N. CA there is a huge opportunity for above marketing ideas because foodie culture is strong in the region and there is a lot of wealth here
- Infrastructure improvements are difficult but can be easier to get done compared to changing management to access new stocks (e.g., permits, gear restrictions)
- Programs to mentor new entrants: partner with educational institutions to bring in young interns;

- [answer box of chocolates]
- Invest in multiple gear types to capitalize on different stocks when they are abundant
- Get more real time data on stocks using fishing vessels as platforms (including recreational); investigate and develop new technologies for this that are affordable; this will facilitate a more nimble approach to assessment to management
- Managers understand in real time, fishermen capitalize on that, markets set up to switch to different species
- Develop methods to use anecdotal/empirical information within the science process
- Accelerate transportation of product to market (coupled with expanded market access). Present day example: surf smelt available to catch with lampara nets. The limiting factor was markets not transportation

teaching kids skills like filleting fish, get them to think beyond college as they only path to a good career; Young Fishermen's Act is an example of legislation to accomplish this (and there are other examples of ways to open up alternative, non college career paths).

Emphasize path - from deckie to captain

- Other examples of programs to encourage young people to get involved and motivate them to sculpt their future
- But don't necessarily discount value of a college education
- Fish moving in and out of our waters -- need to think now about interjurisdictional issues now
- Need to figure out how we do flexibility now without detracting from our current opportunities (robbing Peter to pay Paul)
- LE programs - purpose has been sizing fishery to stock (mitigate overcapitalization); rethink approach (ex. trawl rationalization, loss of fleet in CA). LE concentrates opportunity, coupled with ability to have multiple permits on one boat
- Example of opportunity of de minimis sardine opportunity; lower barrier entry -- managers need to figure out how to regulate small scale artisanal fisheries without harming the larger fisheries.
-

- [answer blue revolution]
- Very focused marketing because fewer stocks are abundant (perhaps hyper local)
- Capitalize on fishermen's knowledge about habitats and ecosystem to work with other ocean users to mitigate the effects of those activities
- Japan is a good example of extensive aquaculture coexisting with fishermen; co-ops are organized to both and figure out how make them complementary
- Be "in the room" for political/policy discussions on ocean uses
- Local markets and consumer education even more important in this scenario;
- co-ops may be an effective mechanism to speak with a common voice on the range of issues we are talking about
- Fishermen should be open to pivoting to mariculture (not Atlantic salmon but species more in tune with the local environment); mariculture could also attract wild fish to the area
- "Regain community": fishermen need to come together - resolve inter-sector conflicts and understand we're all in this together; organizational reps (FMAs, agencies, etc.) talk to local fishermen and regain their trust. We have lost culture and values of our parents' generation in terms of social cohesion and need to regain that
- HFMA is working with mariculture operation knowing we can't stop it and need to mitigate the effects; our approach is different compared to approach to wind power

- [answer hollowed out]
- Sell your boat and do something else...
- Reduce debt and operational costs, crew, etc. Recognize reduced income stream
- Fishermen will need to protect their position and be more vocal in management forums to protect what you have
- Probably not a scenario to encourage new entrants to fisheries
- Drive collaboration between local/state/federal agencies, and do it sooner rather than later
- Create as much fluidity as possible among a much smaller number of players; this would be a wholesale change in regulating access
- Figure out how to keep some remnant of the large, more industrial fleet since they provide basis for port infrastructure; IFQs might be one way to allow more flexibility to scale size up and down
- How do we deal with stranded assets (e.g., vessels)?
- LE permits controlled by an organization that does allocation on some basis other than price; this is the only way to have younger, new entrants

Cross cutting actions/ideas

- Flexibility - allocation, markets, ... How to make it happen without being disruptive to existing plans to stabilize fisheries?
Need to start thinking about this now before change creates acute problems
- Marketing - develop strategies for different approaches to marketing
- Engage in discussions around aquaculture and other ocean uses -- this does seem cross-cutting, not just Blue Revolution

Breakout 2: Potential actions for fishery managers in Northern California

For each scenario:

*If you knew this scenario was going to be the future, what should fishery managers do now? What should they consider doing in this scenario in future? (i.e. identify **actions** to prepare for this situation, to ensure it happens, or to avoid it happening)*

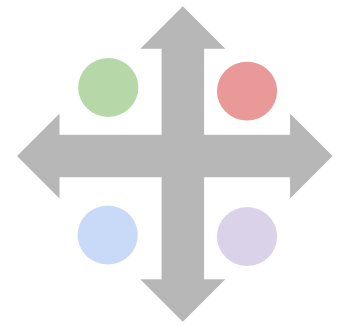
- Do everything in our power to reduce hurdles to regulatory change / allow flexibility
- Work with ports and fishing communities to ensure they are prepared for new species/fisheries/gear types/processing
- Provide the ability to transfer the permit to a new person or new gear type
- Provide flexible gear options/portfolio permits (for multiple species)
- Use fishing cultural history as a tool for promoting and ushering through fishing community sustainability plans
- Community-owned quota shares & leasing (e.g. Monterey)
- Allow the connection between fishing industry and local community (i.e. reduce regulatory hurdles for ability to sell/buy local). Provide latitude in permitting local sales
- Capacity-building technical support. Educate the public on sustainable fishing, available species, seasons, where the ports are, where you can buy fresh-caught fish locally (spread the word!)

- Adopt new technologies for better monitoring - addresses/mitigates enormous uncertainty (e.g. electronic fish tickets provide real-time reporting and reduce management uncertainty for stocks with quotas)
- Interdisciplinary approach to building digital capabilities, for more real-time monitoring/reporting/management. Frees up workload for managers
- Digital opportunities to connect and submit reports are great for all scenarios, as well as sharing and analysis.
- Educate the public on available species as they arise

- Form new advisory groups to interact with various ocean-users (Habitat Committee serving that role now for all users)
- Understand the effect that new structures have on fish aggregation
- New analyses on how new structures will affect fishing grounds (e.g. wind farms) Where will that fishing effort go?
- Strive for a competent marine spatial planning process and outcome
- Aggregate/synthesize information from various data streams to provide a more comprehensive understanding
- Consider how aquaculture can affect water quality and the integrity of the environment
- Create a unified voice when it comes to knowledge/policy
- Utilize interdisciplinary approaches to answer new questions/address new issues (whether intra-agency or across agencies)
- Preserve infrastructure for ups and downs (short-term fluctuations)
- Provide flexible gear options/portfolio permits (for multiple species)
- Do everything in our power to reduce hurdles to regulatory change / allow flexibility

- Provide flexible gear options/portfolio permits (for multiple species)
- Do everything in our power to reduce hurdles to regulatory change / allow flexibility. Find opportunities/maximize harvest opportunities and allow efficient access to them. Catch limits should reflect lower stock abundance
- Prepare for more requests for experimental gear/fishery permits
- Short term disaster relief: Prepare for more fishery disaster relief/overseeing those processes (review previous experiences, how could the next time go more smoothly/be more efficient). Preserves infrastructure
- Long term disaster relief: Chronic situations must be addressed in a different way. Important to recognize when a fishery is no longer viable
- Support small-scale wild-caught fishing (in depressed conditions, large-scale operations will likely flee). Large-scale, land-based aquaculture operations could still be supported
- Correct/alter regulatory language to prevent getting sued!
- Consider how carbon taxes will affect fishing viability

Breakout 3: Looking Across Scenarios - Communities Priority Actions



Review your suggested actions across all 4 scenarios. What does this tell you about the priorities for Northern California communities to prepare for these futures?

Which suggested actions seem to work across all or most scenarios?

- Flexibility and nimbleness (fisheries, management, infrastructure, etc.)
 - Increase Council flexibility for in season management processes (timeliness of responses)
 - Investigate whether other Council's employ a grouping strategy like a group MSY (NPFMC) that could be used in the PFMC process
- Developing direct market strategies both regionally and at the local level to increase awareness
- Collaboration among Northern CA ports (i.e. form regional organizations centered around common interests like the Alliance for Sustainable Fisheries)
- Invest in robust data sets and technology to inform management decisions
- Streamline the federal exempted fishing gear permit process to make the process more efficient
- Investigate the feasibility for community entities/fishermen that hold permits to lease permits to help address shifting stocks and allow others to take advantage of available opportunities
- Increase political engagement to bring fisheries topics to the forefront

What actions are important to do because they prevent the worst-case situation?

- Making sure that there is basic infrastructure available to the fisheries
- Making sure that fisheries stakeholders are engaged and participating in the process
- Developing a new generation of fishery leaders and participants
- Investing in robust data sets to inform climate variability and the potential impacts of climate change on fisheries
- Maintaining and increasing funding where appropriate
- Establishing a mechanism for multi jurisdictional management of fisheries both domestically and internationally

What actions are important because it enables a good future?

- Partnering with the AG community to learn techniques for planning for unpredictability
- The role the fisheries play in the social context, consider how to switch or direct social trends that are pro-fisheries where possible (promote sustainable fisheries, local products, etc.)
- The Council should ensure that they have a process that this scenario planning process to move these actions forward
- Reconstitution of the West Coast Governors agreement to address multi-sector use ocean plans and ensure that all stakeholders, managers, are part of the process
- Tourism should be used as a natural partner to preserve fisheries and coastal communities

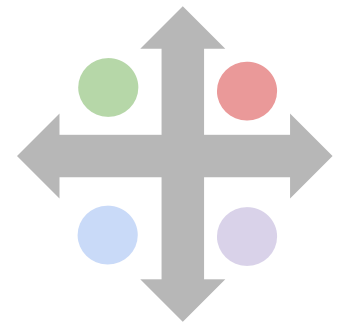
What actions help build flexibility to cope with the future?

- See above :)
- Diversification of fishery portfolios
- Marketing diversification and building consumer interest in a broader group of species
- Creativity is needed in all sectors (management, fisheries, marketing, science, technology, etc.).
- Engaging new audiences and groups by bringing in new generations

What should you stop doing given these scenarios?

- Stop status quo, in order to re-evaluate and improve upon the status quo
- Stop cutting science funding

Breakout 3: Looking Across Scenarios - Harvester Priority Actions



Review your suggested actions across all scenarios. What does this tell you about the priorities for Northern California harvesters to prepare for these futures?

Which suggested actions seem to work across all or most scenarios?

What actions are important to do because they prevent the worst-case situation?

What actions are important because it enables a good future?

What actions help build flexibility to cope with the future?

What should you stop doing given these scenarios?

Permit flexibility

- Flexibility - allocation, markets, ... How to make it happen without being disruptive to existing plans to stabilize fisheries? Need to start thinking about this now before change creates acute problems
- Need to have a discussion right now around flexibility. Such a discussion needs to take into account potential effects on existing fisheries
- Permitting: consider state owned non transferable permits.
- For new entrants: small allocation linked to merit based permit allocation
- Include a mechanism to cut off landings to avoid going over a quota
- Stability necessary, especially for capital intensive operations (big vessels but even smaller vessels can be very expensive); solution has to be scalable
- Alternatively, community owned permits, which is very scalable and can maintain stability
- Eliminate transferable permits entirely to address asset value inflation - there are historical examples of approaches like this (other basis for obtaining permit such as skill demonstration). But these approaches have not been popular / successful historically so have to figure out how to make them feasibility

- Need for training to accompany privileges that come with a permit (to operate “a monster piece of equipment”)
- These strategies are especially important for community based fisheries, probably more applicable to smaller vessels versus “industrial scale” operations. And it’s more likely that new entrants are going to start out in these smaller, community based fisheries.

Marketing

- Develop strategies for different approaches to marketing
- Consumer awareness
- Covid has been a real lesson in expansion of consumer tastes for fish
- Retailers doing a crummy job with handling and quality reflects poorly on fishermen and the industry; need to pressure them for quality
- Matching small buyers to small, high quality sources of supply -- especially for bycatch (non target) product landed in small quantities
- Fishermans' responsibility for product quality
- Skill set for promotion not natural for fishermen

What should we stop doing?

- Look for ways to reduce the barriers between different fisheries to allow cross participation (example of prohibited species regulations that require discarding) - another example is market squid bycatch by shrimpers

Infrastructure needs

- To facilitate flexibility, e.g., make facilities mobile...
- Loss of processing infrastructure means less capacity to adapt to different conditions
- Cost of living is increased in coastal communities so it may mean having centralized processing facilities in inland areas with fish trucked to them
- Fishery management agencies should pay attention to land use policies in the coastal zone so that fishing related infrastructure is preserved

Across the scenarios, what concerns you the most?

- Loss of the history and culture of fishing - fishing, fishing communities, ecosystem is not valued

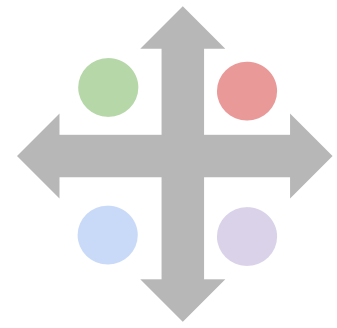
- That we keep the same management processes without adapting to rapidly changing conditions; the management process needs to respond more rapidly based on the provision of real time data (electronic reporting/monitoring, big data); let's think outside the box from a blank slate to innovate the management system
- Losing the fishing industry because we can't replace fishermen that are aging out
- That we don't consider the ecosystem holistically

Science:

- Look at data from "abnormal" years to forecast what future conditions will be like
- Fishermen need to be part of the science and management process - cooperative research, view fishermen as collaborators, think in terms of "platforms of opportunity"

- Engage in discussions around aquaculture and other ocean uses

Breakout 3: Looking Across Scenarios - Fishery Science Priority Actions



Review your suggested actions across all scenarios. What does this tell you about the priorities for Northern California fishery scientists to prepare for these futures?

Which suggested actions seem to work across all or most scenarios?

- Provide flexible gear options/portfolio permits (for multiple species). Do everything in our power to reduce hurdles to regulatory change/allow flexibility
- Anticipate vs react. There will be northward movement in most range shifts. Management needs to understand connectivity and where those EFH are. Anticipation allows flexibility
- Flexibility implies adaptive management
- Speed up management responses. Apply adaptive management in a more timely fashion
- Gathering information and data in real-time. Improve technology for doing so (electronic logbooks, data portals - e.g. CENCOOS, gliders, etc). Data portals (CCE-centric) especially help us anticipate changes in advance. Voice needs for what is included in data portals
- Utilize experimental permits for collecting new data
- Pay attention to the needs of local fishing communities and don't apply a broad set of rules to all
- Ensure equity so that limited opportunities can be enjoyed by all sectors
- Work on the dilemma of untangling the past as far as regulatory structure goes, pursue pilot programs that experiment with new regulatory structure
- Explore the use of different metrics used in management
- Bring stakeholders into more of the processes
- Provide incentives and alternate paths as opposed to roadblocks. Identify common purpose

What actions are important to do because they prevent the worst-case situation?

-

What actions are important because it enables a good future?

-

What actions help build flexibility to cope with the future?

-

What should you stop doing given these scenarios?

-