

Subgroup	Theme/Focus	N_Projects	Top Three Rank			Top Projects
			1	2	3	
1	Stock assessment inputs	12				
	Age and growth, Maturity, Natural mortality	7	1			10
	Stock identification/distribution/genetics	5				
	Fishery Resource surveys	6				
	Development/improvement of survey methods	2		1	1	6
	Interpretation of survey data	4				
2	Stock assessment methods	13				
	Advancement of stock tier	2				
	Data poor methods	1				
	Ecosystem and/or economic data integration	3				
	Model parameterization	2	1			4
	MSE	3		1		6
	Spatial models	2			2	5
3	Observer program	3				
	Development/improvement of survey methods	2				
	Interpretation of survey data	1				
	Bycatch species	8				
	Develop bycatch reduction methods	1				
	Discard mortality	1				
	Impacts of bycatch reduction measures	3				
	Stock identification/distribution/genetics	3	1	1		3
4	Fishery management	4				
	Fishery dependent data collection	1			1	2
	Impacts of measures	3	1			5
	Human communities surveys	1				
	Development/improvement of survey methods	1		1		1
	Human dimensions	7				
	Community impacts of fisheries	3			1	
	Economic data collection	2				
Social and cultural values	2					
5	Habitat	8				
	Fishing effects	2				
	Habitat function	2		1		2
	Habitat mapping	4			1	
	Ecosystem surveys	5				
	Initiation of survey	4	1			4
	Interpretation of survey data	1				
6	Ecosystem processes	14				
	Climate change	5		1	1	4
	Diseases and Parasites	1				
	Ecosystem indicators	4	1			9
	Ecosystem modeling	1				
	Pollution	1				
	Trophic dynamics	2				
	Grand Total	81	6	6	7	

Research ID	Title	Description	Theme	Focus	Final Top 5 votes
171	Acquire basic life history information (e.g., natural mortality, growth, size at maturity) for data-poor stocks	Basic life history information is needed for stock assessment and management of data-poor stocks, such as scallops, sharks, skates, sculpins, octopus, grenadiers, squid, and blue king crab (Bering Sea), golden king crabs (Aleutian Islands), and red king crab (Norton Sound). Specifically, information is needed on natural mortality, growth rates, size at maturity, and other basic indicators of stock production/productivity.	Stock assessment inputs	Age and growth, Maturity, Natural mortality	10
189	Develop stock-specific ecosystem indicators and incorporate into stock assessments	Develop stock-specific ecosystem indicators and incorporate into stock assessments. (in progress)	Ecosystem processes	Ecosystem indicators	9
176	Refine methods to incorporate uncertainty into harvest strategies for groundfish	Refine P* and decision theoretic methods to incorporate uncertainty into harvest strategies for groundfish for ACL estimation. Continue existing management strategy evaluations at the stock level.	Stock assessment methods	MSE	6

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533	Explore optimal sampling strategies and geospatial approaches for time series of survey data	The Stock Assessment Improvement Plan seeks to ensure that NMFS conducts its surveys in the most effective and efficient manner possible. Statistical analysis of the optimal number of survey stations needed to accurately assess the status and trends of groundfish and crab stocks is required to achieve this goal. An extension of this activity would be to explore alternative abundance estimation methods. For example exploring Thorson's geostatistical model as an alternative to the designed-based estimates for abundance indices used in stock assessments is a potentially useful analysis. Extensions would include an assessment of whether there are certain life history characteristics or levels of aggregation when geospatial	Fishery Resource surveys	Development/improvement of survey methods	6
177	Conduct prospective and retrospective analyses of changes in the spatial and temporal distribution of fishing effort in response to management and environmental changes	Conduct prospective and retrospective analyses of changes in the spatial and temporal distribution of fishing effort, in response to management actions (e.g., time/area closures, marine reserves, PSC and other bycatch restrictions, co-ops, IFQs, multi-target crab fisheries) and environmental changes.	Fishery management	Impacts of measures	5

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163	Conduct routine fish, crab, and oceanographic surveys in the Arctic Ocean	Dynamic ecosystem and environmental changes in the Arctic Ocean are occurring. Assessment of the current baseline conditions and trophic interactions is important. This effort should not supplant the regular surveys in the BSAI and GOA, which are of critical importance to science and management.	Ecosystem surveys	Initiation of survey	4
174	Develop spatially explicit stock assessment models	Develop spatially explicit stock assessment models. High priority species for spatially explicit models include: walleye pollock, snow and Tanner crab, Pacific cod, sablefish, yellowfin sole, rock sole, arrowtooth flounder, Pacific ocean perch, black spotted rockfish, rougheye rockfish, and Atka mackerel.	Stock assessment methods	Spatial models	4
366	Continue to investigate time variation and the shape of fishery and survey selectivity models	There is considerable controversy about (1) whether selectivity should be dome-shaped or asymptotic, and (2) whether selectivity should be time-varying by default. Using a dome-shaped curve can create a large increase in biomass which may not be real. Treating selectivity as time-varying increases the number of model parameters greatly, which may lead to confounding among parameters. Better scientific guidance through research studies is needed to address these two problems.	Stock assessment methods	Model parameterization	4

Research ID	Title	Description	Theme	Focus	Final Top 5 votes
183	Research the role of habitat in population dynamics and ecosystem processes	Research is needed on the role of habitat in population dynamics and ecosystem processes. Specifically, studies are needed to evaluate how habitat-forming species (e.g., corals) influence life history parameters (e.g., mortality, growth, movement) of FMP species and their preferred prey. Such research will identify key habitats (including essential fish habitat and habitat areas of particular concern), improve the design and management of marine protected areas, and ultimately improve stock assessments and restoration efforts.	Habitat	Habitat function	2
191	Assess whether changes in pH and temperature would affect managed species, upper level predators, and lower trophic levels.	Assess whether changes in pH and temperature would affect managed species, upper level predators, and lower trophic levels. Laboratory studies are needed to assess the synergistic effects of ocean acidification and changes in temperature on productivity of marine species.	Ecosystem processes	Climate change	2

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613	Maintain and update coupled biophysical projections for the North Pacific	Coupled model projection systems are needed to support the NPFMC's strategic initiatives related to the Bering Sea Regional Action Plan, the Bering Sea Fisheries Ecosystem Plan and the Alaska Climate Integrated Modeling activity. Research is needed on methods to dynamically downscale physics and bio-geo-chemical information derived from global models and earth systems models to regional ocean models (ROMs) as well as methods for coupling nutrient-phytoplankton-zooplankton (NPZ) into ROMs. Likewise continued research on methods for coupling biological models (including the response of fishers) to projected environmental change will be an ongoing strategic activity. Projected environmental conditions from the ROMs/NPZ model is the foundation for management strategy evaluations needed to provide climate informed harvest strategies for the future. Support for continued update and refinement of the ROM/NPZ coupled models will be an ongoing strategic research need for the NPFMC.	Ecosystem processes	Climate change	2
651	Identify proportion of hatchery vs. wild bycatch from within Trawl fisheries. Thermally marked otolith project to support PSC salmon stock composition in the Gulf of Alaska	Thermally marked otolith project to support PSC salmon stock composition in the Gulf of Alaska Work is needed to combine the genetic, thermal marking, and wire tag data collected from salmon bycatch in the Central Gulf of Alaska Rockfish program to determine the relative proportion of wild to hatchery fish. This is important since bycatch caps are not related to the number of hatchery releases, and chinook releases from Washington are expected to rise to support orca whale survival.	Bycatch species	Stock identification/distribution/genetics	2

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New Research Recommendation	Identify best practices for catch estimation for large bycatch species	Evaluate whether alternative methods of weight estimation for large species of bycatch such as sharks can be made rather than direct measurements, including the alternative of managing by numbers.	Fishery management	Fishery dependent data collection	2
156	Improve knowledge for salmon PSC impact assessment	Improve the resolution of Chinook and chum salmon genetic stock identification methods (e.g., baseline development, marker development), improve precision of salmon run size estimates in western Alaska, and initiate investigations of biotic and abiotic factors influencing natural mortality rate during ocean migration in the GOA and BSAI. Baseline development is nearing completion, but more work on Cook Inlet chum is needed.	Bycatch species	Stock identification/distribution/genetics	1
178	Develop a framework and collect economic information	Develop a framework for the collection of economic information on commercial, recreational, and charter fishing, as well as fish processing, to meet the requirements of the MSFCMA sections 303(a)(5, 9, 13), 303(b)(6), and 303A.	Human communities surveys	Development/improvement of survey methods	1
383	Determine quantitative indicators of spatial structure, particular for walleye pollock and Pacific cod	The next generation of stock assessment models will be spatial age- and length-structured assessment models, in line with the goal of ecosystem-based fishery management. Current distributions of spatial location have been empirically summarized, but methods should be explored to convert these to movement patterns for biological and/or management regions.	Stock assessment methods	Spatial models	1

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146	Improve surveys in untrawlable habitat, particularly for rockfish, Atka mackerel, and sculpins	For groundfish in general, and rockfish and Atka mackerel in particular, continue and expand research on trawlable and untrawlable habitat to improve resource assessment surveys. For example, improved surveys, such as hydro-acoustic surveys, are needed to better assess pelagic rockfish species that are found in untrawlable habitat or are semi-pelagic species such as northern and dusky rockfish. A number of publications specific to untrawlable grounds and rockfish sampling have been published recently, but have not been incorporated directly into routine stock assessment routine survey designs.	Fishery Resource surveys	Development/improvement of survey methods	0
237	Improved habitat maps	Improved habitat maps (especially benthic habitats) are required to identify essential fish habitat and distributions of various substrates and habitat types, including habitat-forming biota, infauna, and epifauna in the GOA, BS, and Aleutian Islands.	Habitat	Habitat mapping	0
431	Develop tools for analyzing coastal community vulnerability to fisheries management changes	Develop tools for for assessing and predicting coastal community vulnerability to fisheries management changes. Assess changes in community vulnerability over time by FMP and individual catch share fishery.	Human dimensions	Community impacts of fisheries	0