



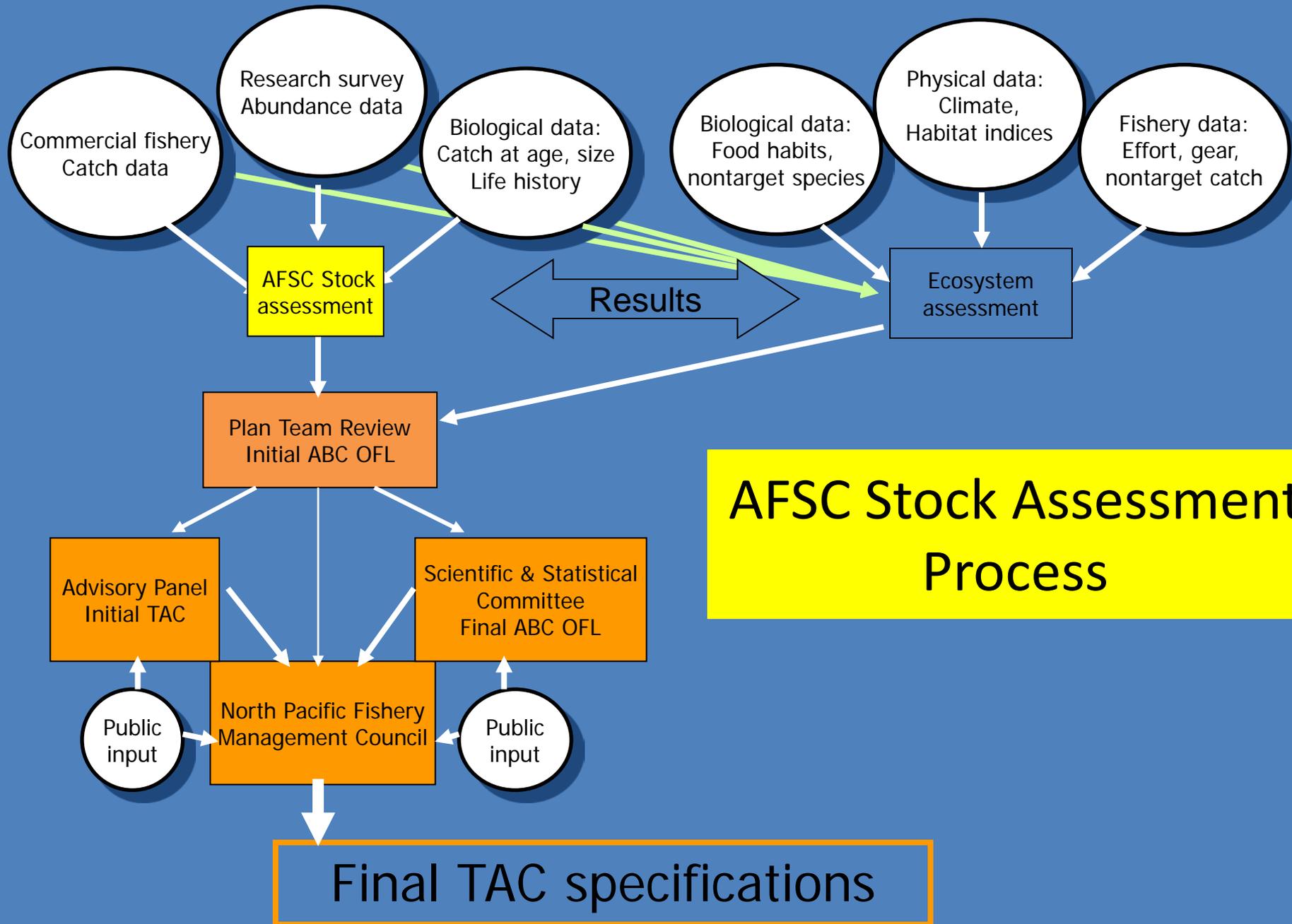
NOAA
FISHERIES

Alaska Fisheries
Science Center

Stock Assessment Process

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Fishery Dependent and Independent Data Review
August 26, 2013



AFSC Stock Assessment Process

Number of Stock Assessments

- Bering Sea and Aleutian Islands Groundfish FMP
 - 25 ACLs
 - 125 species – 8 complexes of more than one species
 - Gulf of Alaska Groundfish FMP
 - 26 ACLs
 - 111 species – 10 complexes of more than one species
 - Bering Sea and Aleutian Islands Crab FMP
 - 10 ACLs (AFSC has lead on 4 assessments)
 - Management is deferred to State of AK with Fed oversight
- 12 minor stocks managed using catch-only data

Summary of Stocks use of FI/FD Data Sources

Species (# of stocks)	Fishery Independent (Surveys)				Fishery Dependent Data				
	Bottom trawl	Acoustic	Longline	Other (IPHC, ADFG)	Federal fishery management catch reports	Federal fishery observer collected biological and catch data	Federal fishery CPUE & logbook data	State (AK) fishery catch estimate reports	State (AK) fishery observer collected data
Pollock (4)	4	4		1	4	4		1	
Pacific cod (2)	2				2	2	2	2	
Sablefish (1)	1		1	1	1	1	1	1	
Flatfish (14)	14		1		14	14			
Rockfish (13)	13		2	2	13	13	1	1	
Atka mackerel (2)	2				2	2			
Crab (4)	4			2	4	4		4	4
Non-targets (10)	10		2	2	10	10	1	5	

Stock Assessment and Fishery Evaluation Report

for the Groundfish Resources of the Bering Sea/Aleutian Islands Region

SAFE

Report

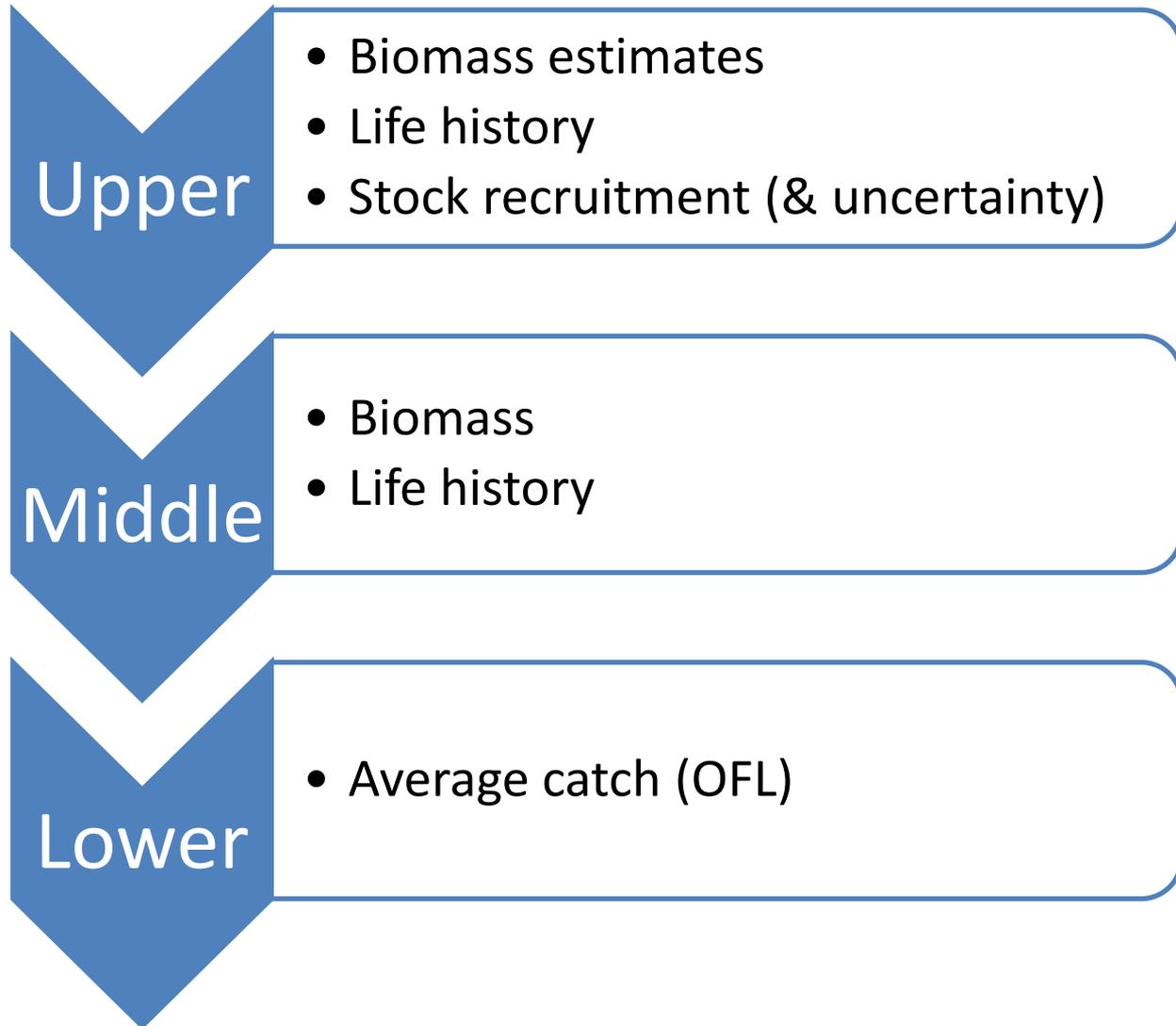
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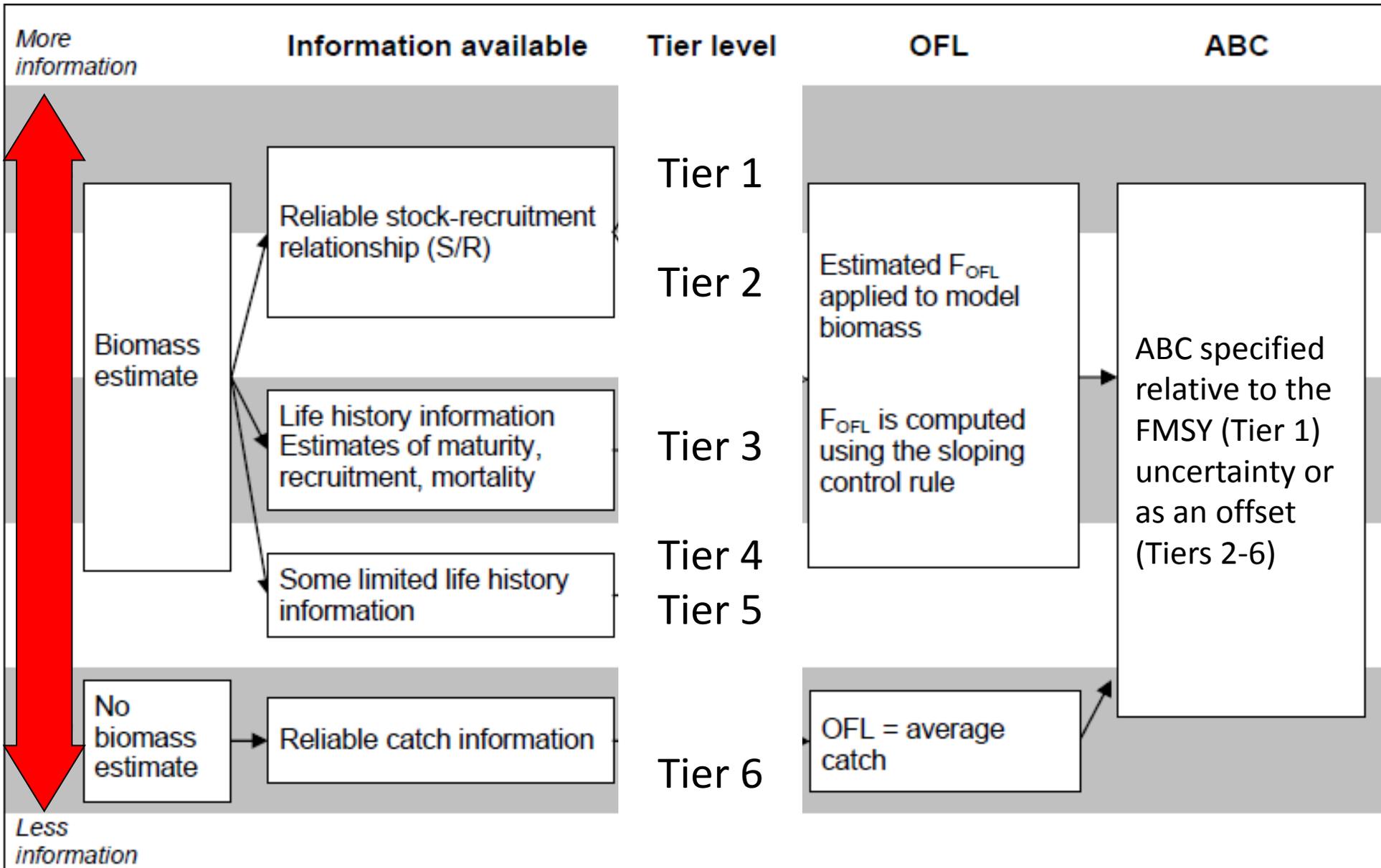
Tiers for ABC/OFL control rules

For each stock

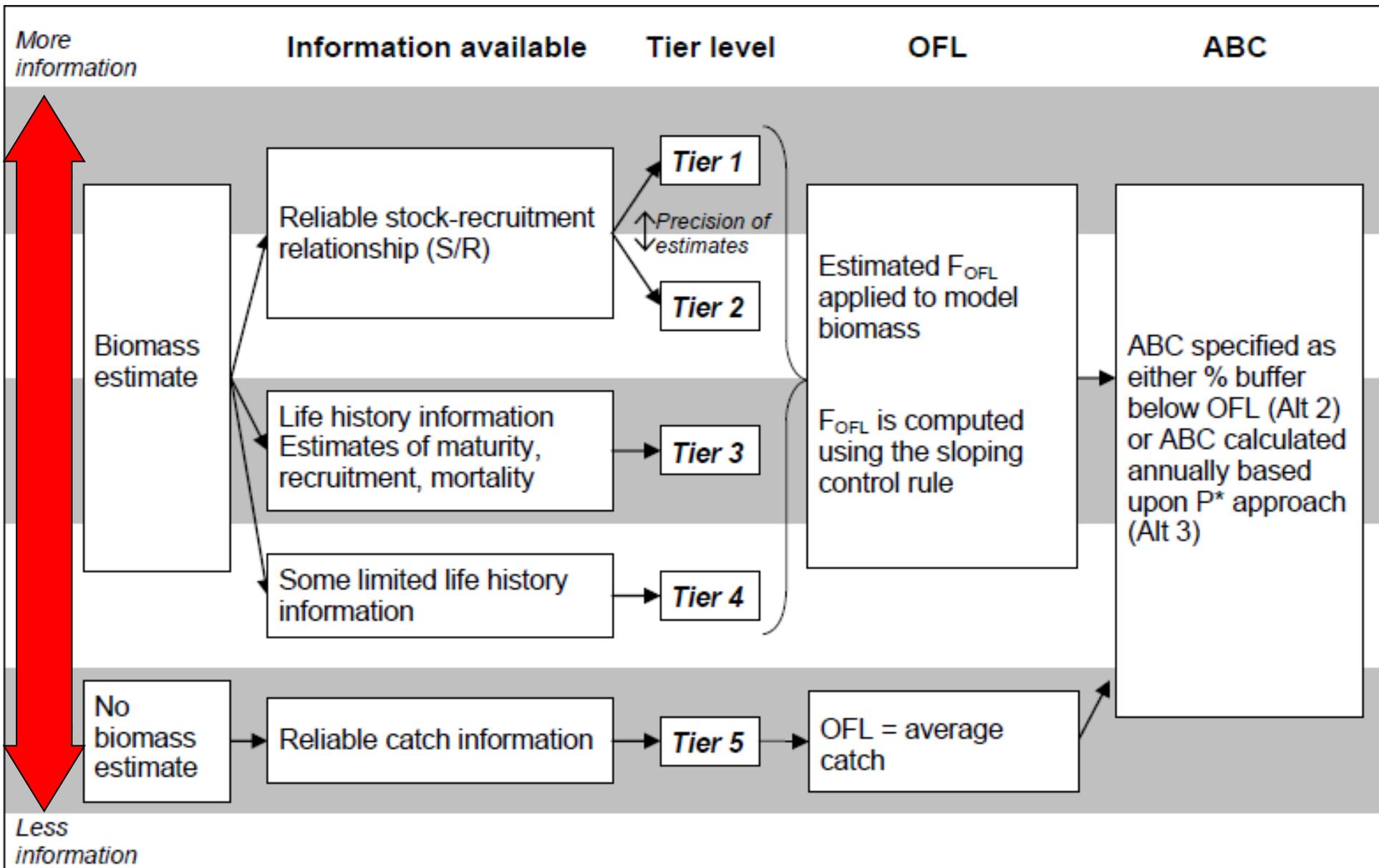
Information



Groundfish OFL Tier system



Current BSAI Crab OFL Tier system



Timing of Annual Process

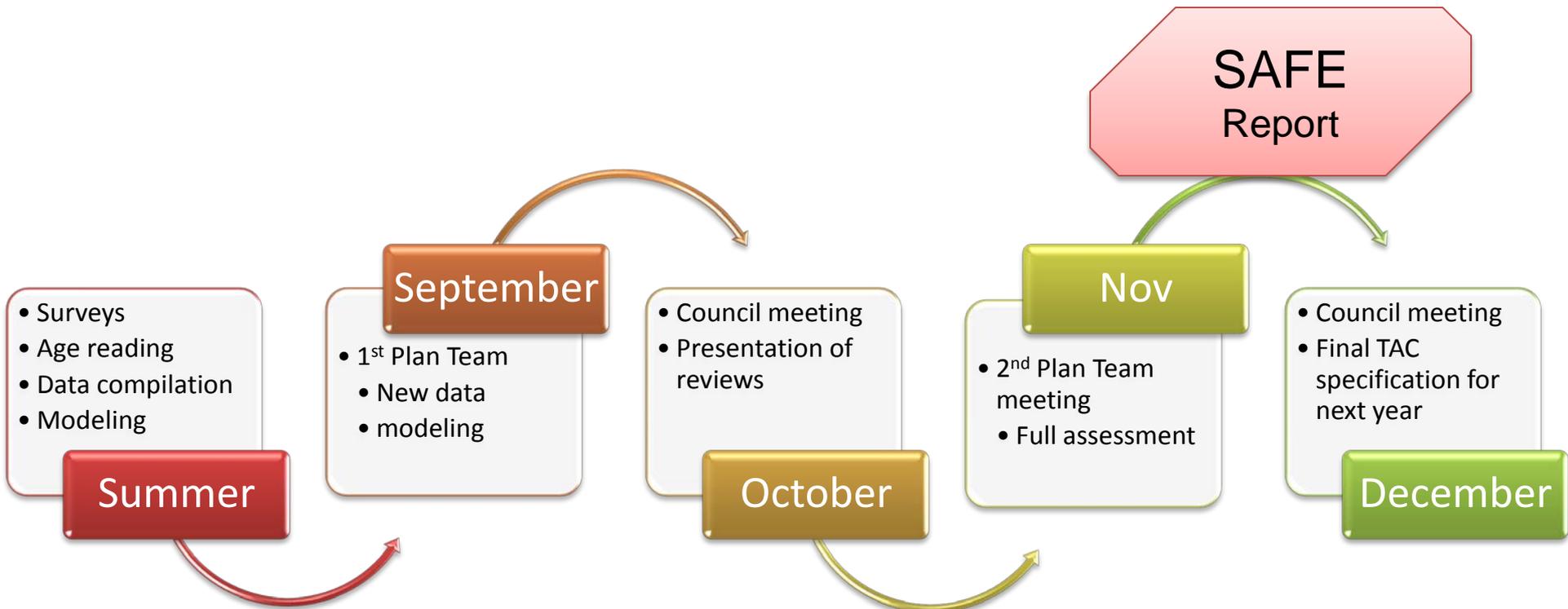
BSAI Crab

- Spring - Models reviewed and approved
- 15 Aug - EBS summer trawl survey estimates available (10days after survey ends)
- 30 Aug SAFE chapters for internal AFSC review
- 6 Sept SAFE chapters for NPFMC CPT/SSC review
- 18-21 Sep NPFMC CPT meeting
- 24 Sep Final SAFE chapters to NPFMC
- 1 Oct NPFMC SSC sets ACLs

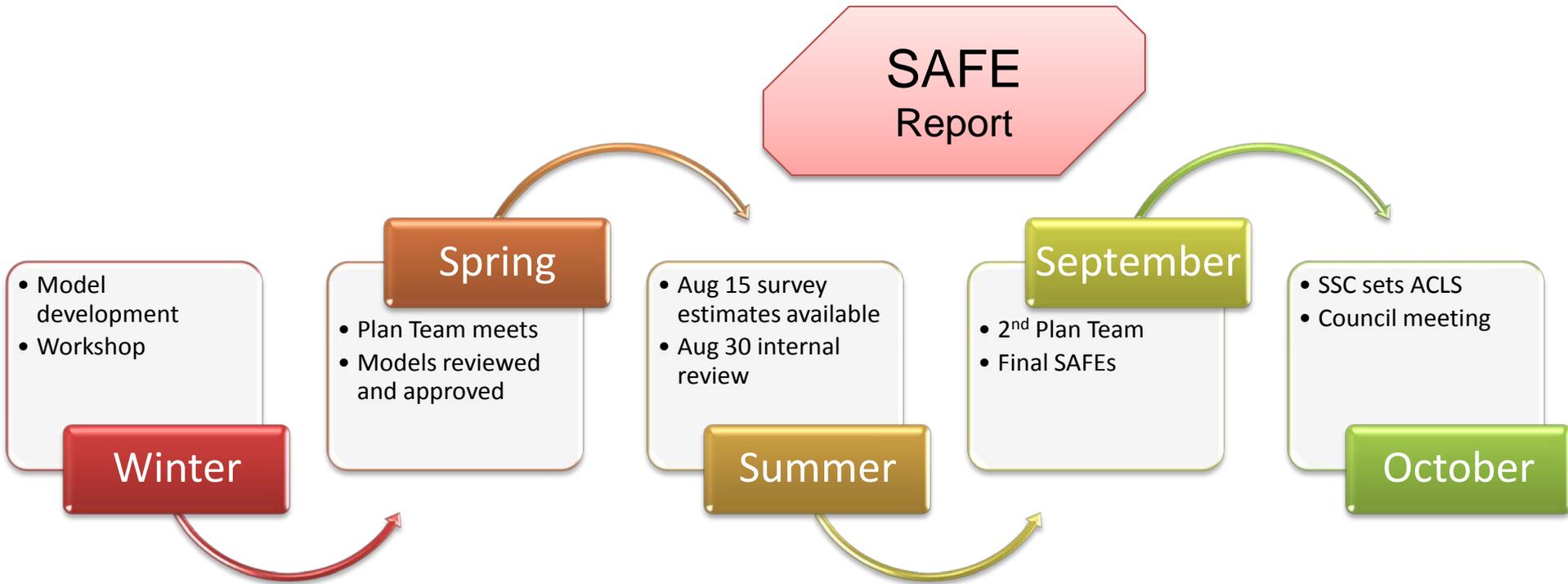
BSAI and GOA Groundfish

- Sep/Oct New Models and assessments reviewed and approved
- Sep/early Oct - Trawl survey estimates available
- 30 Oct SAFE chapters submitted for internal AFSC review
- 12 Nov SAFE chapters sent out for NPFMC groundfish plan team meeting
- 25 Nov Final SAFE chapters to NPFMC
- 9 Dec NPFMC SSC sets ACLs

Timing of Annual Process—Groundfish



Timing of Annual Process—crab



Strengths/Challenges/Solutions

- Strengths
 - Data availability for most assessments is recent
 - Review process is transparent, open, multidisciplinary and multiorganizational
 - Responds to NPFMC, State of AK and stakeholder needs
- Challenges
 - Data turnaround time is quick – leaves little time for error checking
 - Assessment and Review process is similarly compressed
- Solutions
 - Continue to refine automated error checking and data validation processes
 - More assessment staff to reduce number of assessments that must be produced in short time period
 - Continue to prioritize the most important data for near-real time inclusion by assessment

EBS Pollock



- Large fishery
 - ~1.23 million t annual catch since 1970s
 - Largest fishery in the USA (by volume)
- 4 sectors:
 - Community development quota groups
 - Catcher boats to shore-based plants
 - Catcher boats delivering to Motherships
 - At-sea catcher-processors
- 100% observer coverage
- Managed under Tier 1 (FMP control rules)

Strengths-EBS pollock

- Beneficiary of BSIERP
 - 5 consecutive years of acoustic survey
 - Unique acoustic-vessels of opportunity (combined w/ bottom trawl)
- Large datasets
 - Observer program
 - Detailed bycatch and monitoring
 - Bottom trawl and acoustic surveys
 - Timely age-determination work
 - Food habits collections
- Multi-faceted
 - Includes extensive analysis of salmon bycatch
 - Opportunistic data breakthroughs
 - AVO from bottom-trawl vessels
 - Commercial vessel data collections

Challenges-EBS pollock

- Year-year variability in recruitment estimates
- Key species within the ecosystem
- Dynamic habitat
 - Role of environmental conditions on distribution
 - Survey
 - Survival effects
 - Aggregation characteristics appear to vary
 - Dispersed distributions in some years can lead to poor fishery catch rates (and higher bycatch)
 - Even when survey indicates abundance is reasonable
- Age determination
 - Heavy workload to complete survey ages
 - Especially in current year
- Observer program
 - Scientific role could be emphasized more
 - Allocation of effort

Solutions -EBS pollock

- Evaluate management implications using multi-species models
- Examine interactions of environment to survey gear availability
 - Kotwicki dissertation
- Evaluate alternative management strategies
 - Extension of Ianelli et al. 2011
 - Multi-species modeling
- Re-consider tagging / movement
 - Modeling (e.g., Miller, Quinn, Ianelli 2008; Hulson et al. 2011, Hulson et al. in press)
- Improve connections to observer program
 - Pre and post data collection

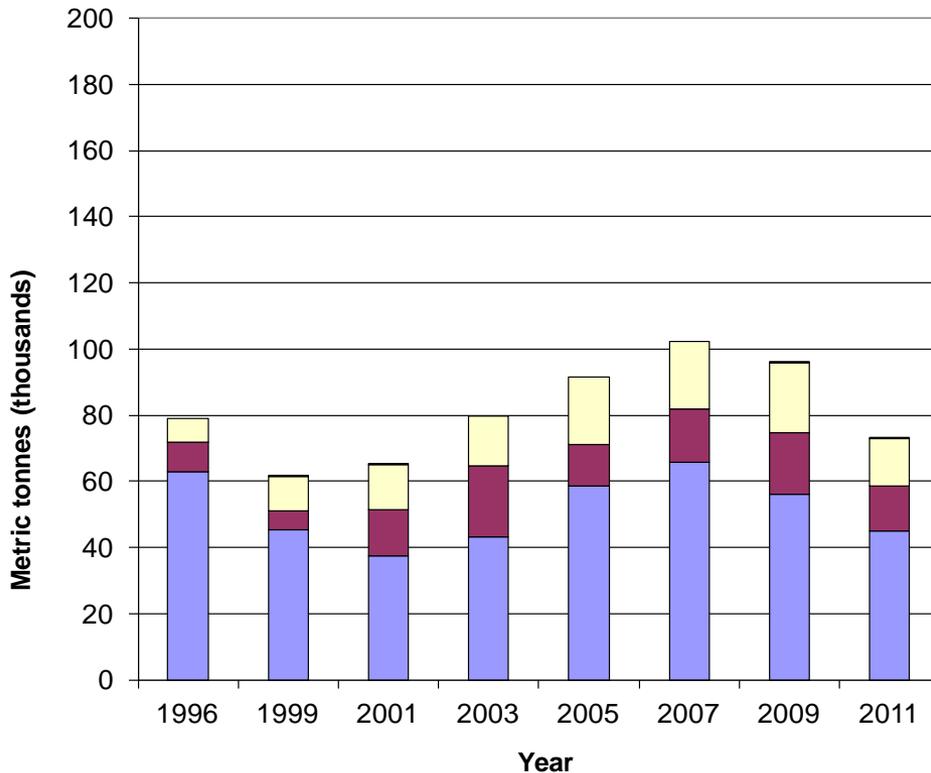
GOA northern and southern rock sole

- Demersal species found in shelf waters to 600 m
- Ranges of N&S overlap in the GOA
- Maximum age above 20
- Growth differences between N&S females
- N spawn in the spring, S spawn in the summer
- Differentiated in the survey data starting in 1996, in the fisheries observer data starting in 1997
- Managed as part of the shallow-water flatfish complex; U/N/S rock sole is 70 - 80% of swff catch
- Moved from Tier 4 to Tier 3 in 2012

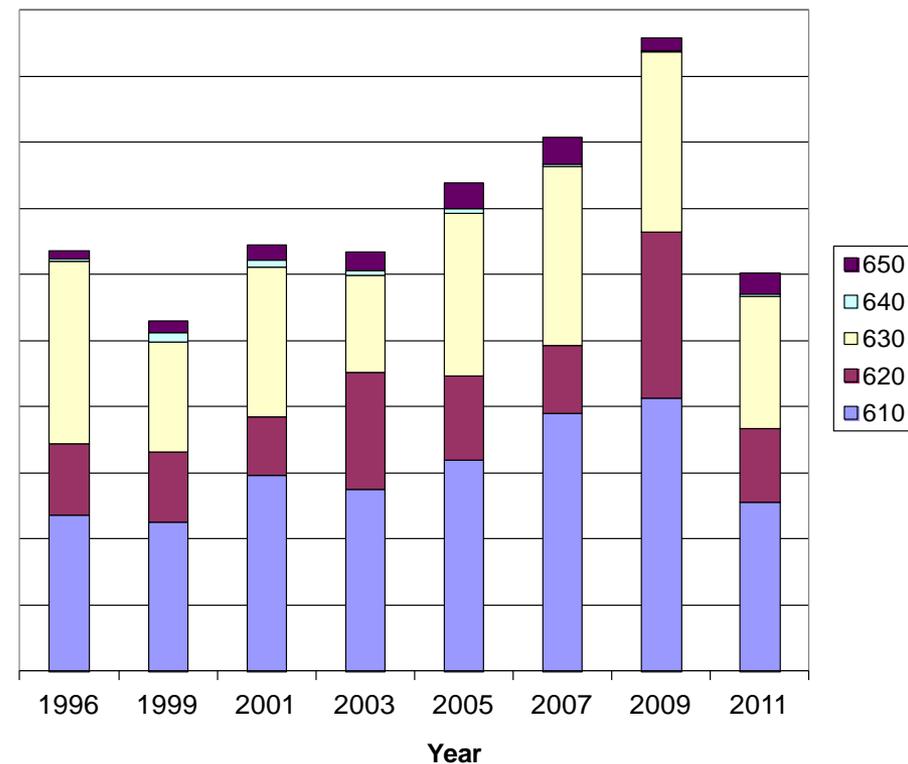
Strengths

- Annual swff catches (< 10,000 mt) have been significantly below the ABCs due to PSC limits

NMFS survey biomass estimates of N rock sole, by area



NMFS survey biomass estimates of S rock sole, by area



Challenges

- Survey
 - Southern rock sole spawn around survey time; unknown distribution of N&S at other times
- Fishery
 - About 20% of the shallow-water flatfish catch is observed
 - Most observer samples are from central GOA
 - Confirmation of species: some recent samples list species as unidentified rock sole

Proposed solutions

- Different sampling designs/acoustics could help increase survey precision, but difficult to incorporate into current survey
- Tissue collection from survey and fishery observer samples to confirm species
- GOA-wide surveys at other times of the year

Alaska Sablefish

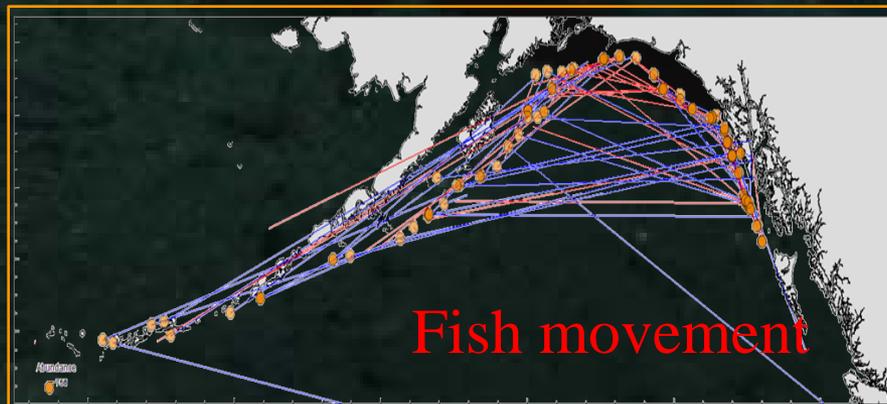


- >\$100 million ex-vessel value
- Deep water (fishery averages about 650 m)
- Long-lived (max age about 80)
- Primarily longline gear
- Over 400 vessels, catch is about 15,000 t annually
- Only AK assessment treated as one stock
- Only model in AK that fits fishery CPUE index

Strengths



- Dedicated annual longline survey since 1979
- Immense tagging program (>300,000 releases, 30,000 recoveries)
- Lots of data (3 surveys and fishery abundance fit)
- Logbook data as well as observer data



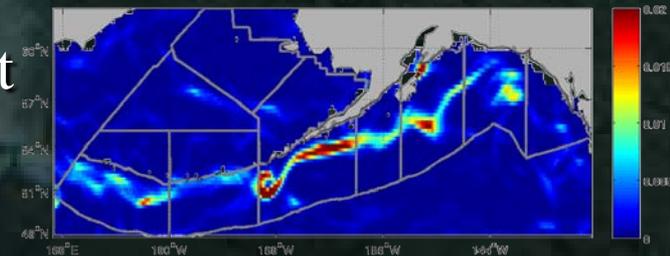
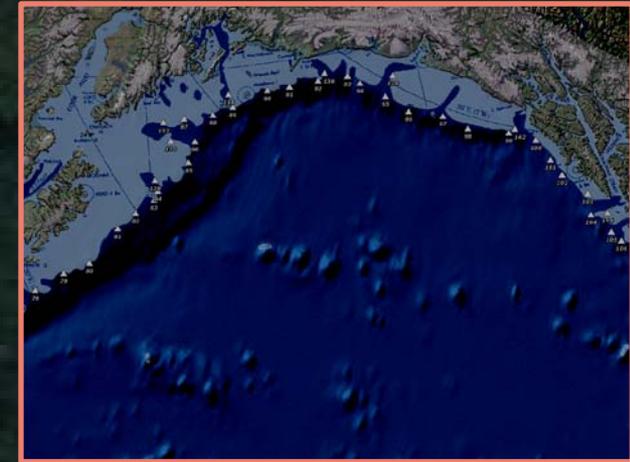
Challenges

- Whale depredation
 - Sperm whales
 - Small overall effect on survey
 - Larger effect on fishery catch, particularly in Eastern GOA
 - Killer whales
 - Large effect on survey (~85% removal on affected skates)
 - Large effect on fishery mostly in BSAI, Western GOA
- Standardizing fishery CPUE
- Recruitment more related to environment than spawners
- Incorporating movement/tag data in model
- Utilizing data from observer restructuring – incorporating vessels <60 ft.



Proposed Solutions

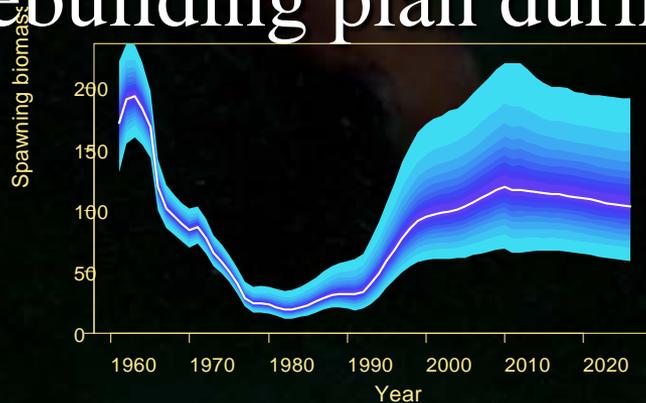
- Use model estimated whale effects to account for depredation on surveys
- Estimate additional catch/mortality in fishery
- Fishery effort increasing for pots
- Model fishery CPUE of both logbooks and observer data for standardized abundance index
- Create spatially explicit model that fits tagging data
- Include environmental data in assessment model to help estimate/project recruitment



GOA Pacific ocean perch



- Deep water (fishery averages 200 m)
- Long-lived (max age about 100)
- Exclusively trawl gear
- Recovered from overfishing (was on rebuilding plan during 1994-1996)



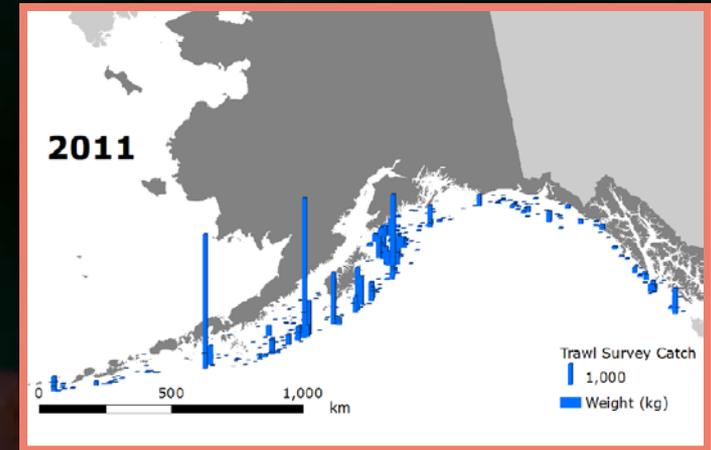
Strengths

- Good observer coverage because of Rockfish Program in Central GOA (rationalization)
- Eastern Gulf closed to trawling creates de facto reserve
- Tends to be in more trawlable grounds than other rockfish for surveys



Challenges

- Traditional survey designs sometimes perform poorly on patchy distribution
- Availability by trawlable and untrawlable habitat
- Genetics suggest stock structure smaller than management regions
- Tagging difficult because of barotrauma
- Recruitment more related to environment than spawners (YOY/larvae hard to identify)



Proposed solutions

- Different sampling designs/acoustics could help increase survey precision, but difficult to incorporate into current survey
- Estimating ratio of abundance in trawlable and untrawlable habitat with adv. tech.
- Explore size of management areas in relation to sizes suggested by genetics
- tagging codend works for other but is expensive (500k).



Rockfish Acoustic Backscatter

