



# Monitoring Technology in Alaska

Fishery Monitoring and Analysis (FMA)  
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**NOAA**  
**FISHERIES**  
**SERVICE**

NOAA

# Monitoring Objectives for NP Observers

<b>Current Monitoring Objectives via Observers on Vessels</b>	<b>Observer</b>	<b>EM as it is currently available</b>	<b>Industry self report</b>	<b>Notes</b>
<b>Birds</b>				
Monitor and report take of short-tailed albatrosses	Yes	No	No	
Document all observations of short-tailed albatrosses	Yes	No	No	
Identify and count all other seabirds within samples	Yes	No	No	
Dead short-tailed albatrosses must be frozen and surrendered to the NMFS or the USFWS.	Yes	No	Maybe	Physical

# Monitoring Objectives for NP Observers

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<b>Mammals</b>				
Record marine mammal sightings	Yes	Maybe	Maybe	
Record marine mammal interactions including deterrence, entanglements, lethal removals, ship strikes, and predation on fishing gear by sea lions, sperm whales and killer whales.	Yes	Maybe	No	
Collect marine mammal parts (snouts, etc)	Yes	No	No	Physical specimens

# Monitoring Objectives for NP Observers

<b>Current Monitoring Objectives via Observers on Vessels</b>	Observer	EM as it is currently available	Industry self report	Notes
<b>Fish</b>				
Catch composition by species in number and weight to incorporate into the CAS for total catch accounting.	Yes, with some species	No	No	
Disposition of the catch (retained or discarded) by weight.	Yes	No	No	
Viability of halibut released	Yes	No	No	
Sexed length frequency data for target and bycatch species	Yes	No	No	
Sexed length and weight for salmon, crab.	Yes	No	No	
Misc biological collections (maturity, genetics, scales)	Yes	No	No	Physical specimens

# Monitoring Objectives for NP Observers

<b>Current Monitoring Objectives via Observers on Vessels</b>	Observer	EM as it is currently available	Industry self report	Notes
<b>Miscellaneous/Invertebrates</b>				
Numbers, weights and identifications of corals and misc invertebrates	Maybe	No	No	
<b>All Species</b>				
Tag recoveries	Yes	No	Maybe	Physical
Collection of voucher specimens	Yes	No	Maybe	Physical
<b>Fishing, gear characteristics, and management program</b>				
Set/ retrieval dates, times, and locations.	Yes	Yes	Yes	
Location of non-fishing days.	Yes	Yes	Yes	
Quantity of gear deployed in each set.	Yes	Yes	Yes	
Quantity of gear retrieved.	Yes	Yes	Yes	
Hook Counts and spacing measurements of specific set segments (sablefish)	Yes	No	Maybe	Hook and line-
Gear performance, including instances of predation.	Yes	No	Maybe	
Beginning and end Depth	Yes	Maybe	Yes	
IFQ- Yes or no	No	No	Yes	
CDQ group number if applicable	No	No	Yes	

# Monitoring Objectives for NP Observers

<b>Current Monitoring Objectives via Observers on Vessels</b>	Observer	EM as it is currently available	Industry self report	Notes
<b>Regulatory Compliance</b>				
Compliance with careful release regulations.	Yes	Yes		Hook and line
Ensure rehabilitation of injured short-tailed albatross	Yes	No		Physical handling required
Compliance with seabird avoidance measures	Yes	Yes		
Compliance with time area closures	Yes	Yes		
Real time position monitoring	Yes	Yes, with GPS		
Witness flow scale testing and record test weights and results	Yes, daily	Yes, via VMS		Flow scale

# Compliance Monitoring in Alaska using Video

- Amendment 80 to the Bering Sea Aleutian Island non-pollock trawl fishery requires video recording of sorting activity in bins (or an alternative measure) to prevent pre-sorting of the catch before the observer has an opportunity to sample the catch;
- Amendment 91 to the Bering Sea Aleutian Island pollock trawl fishery requires video monitoring of all locations where salmon bycatch is sorted by the crew and the location where the salmon are stored until sampling by an observer.
- Starting in 2013, freezer longliners with endorsements to catch and process Pacific cod with hook and line gear in the BSAI have additional equipment and operation requirements. If vessels are using motion-compensated scales to weigh Pacific cod, they are required to maintain a video system to monitor sorting and flow of fish over the scale.

# Scientific Data Collection using Video.

No operational video monitoring programs in NMFS-managed fisheries where data extracted from video are used for science or management purposes.

## •What's the Problem?

1. Inability to accurately identify species
  2. Cannot obtain weights of discarded fish
  3. Length of time required to obtain and review video and extract all requisite information
  4. Cannot collect biological samples
- Evaluate a potential audit based approach/strategy (B.C.).
  - Requires use of self reported data that is assumed to be without error, dockside monitoring and retention requirements.



# Scientific Data Collection using Video.

We are proceeding to develop a catch estimation approach given that:

1. Catch data can be integrated into the existing observer data stream and Catch Accounting System (CAS)
2. Provides opportunity to estimate discard from all sampled species and uncertainties (you can buy greater precision)
3. Observer information can potentially be used to inform EM where needed (per each defined post strata).
4. Scalability
5. Simpler and potentially more efficient; now and in the future

# Improving EM to Deliver a Quality Cost Effective Data Product.

- Performance standards
  - Species identification
  - Maintenance protocols
  - Test and Improve System Reliability
- Vessel Monitoring Plans (standardized templates)
  - Develop and evaluate fleet cooperation
  - Define operator responsibilities and standards
  - Catch handling procedures (control points)
  - Develop equipment maintenance procedures
  - Vessel Integration

# Improving EM to Deliver a Quality Cost Effective Data Product.

## •Data

- Conduct simulations to determine minimal sub-sampling requirements
- Develop potential algorithms for catch estimation
- Evaluate and improve the time to process
- Identify and economize data storage needs and archiving
- Find solutions to data gaps (Observer data?)
  - Species Weight estimates
  - Biological Samples
  - Rare species interactions

# Improving EM to Deliver a Quality Cost Effective Data Product.

- Costs

- Port sampling staff as required
- Additional Staff
  - Programming
  - Data extraction/post processing
  - Analytical
- Equipment and Installation/ Maintenance costs
- Minimize Video review and data compilation
- Develop Efficient Data storage/archiving
- Post processing automation

# Comprehensive Approach that will Incorporate Multiple Data Sources that Aligns with Current Infrastructure and Data Needs

## Data Need

- Compliance Monitoring
  - Camera based systems (flow scales discard)
  - VMS
  - Passive monitoring techniques, GPS and data loggers to determine fishing effort and location
- Scientific Data Collection
  - Observer sampling
  - CPUE trend time series to support stock assessments
  - Length/weight composition
  - Species composition
- Effort
  - e-log
  - Post stratification assumptions
  - Observer effect
  - Self reporting systems

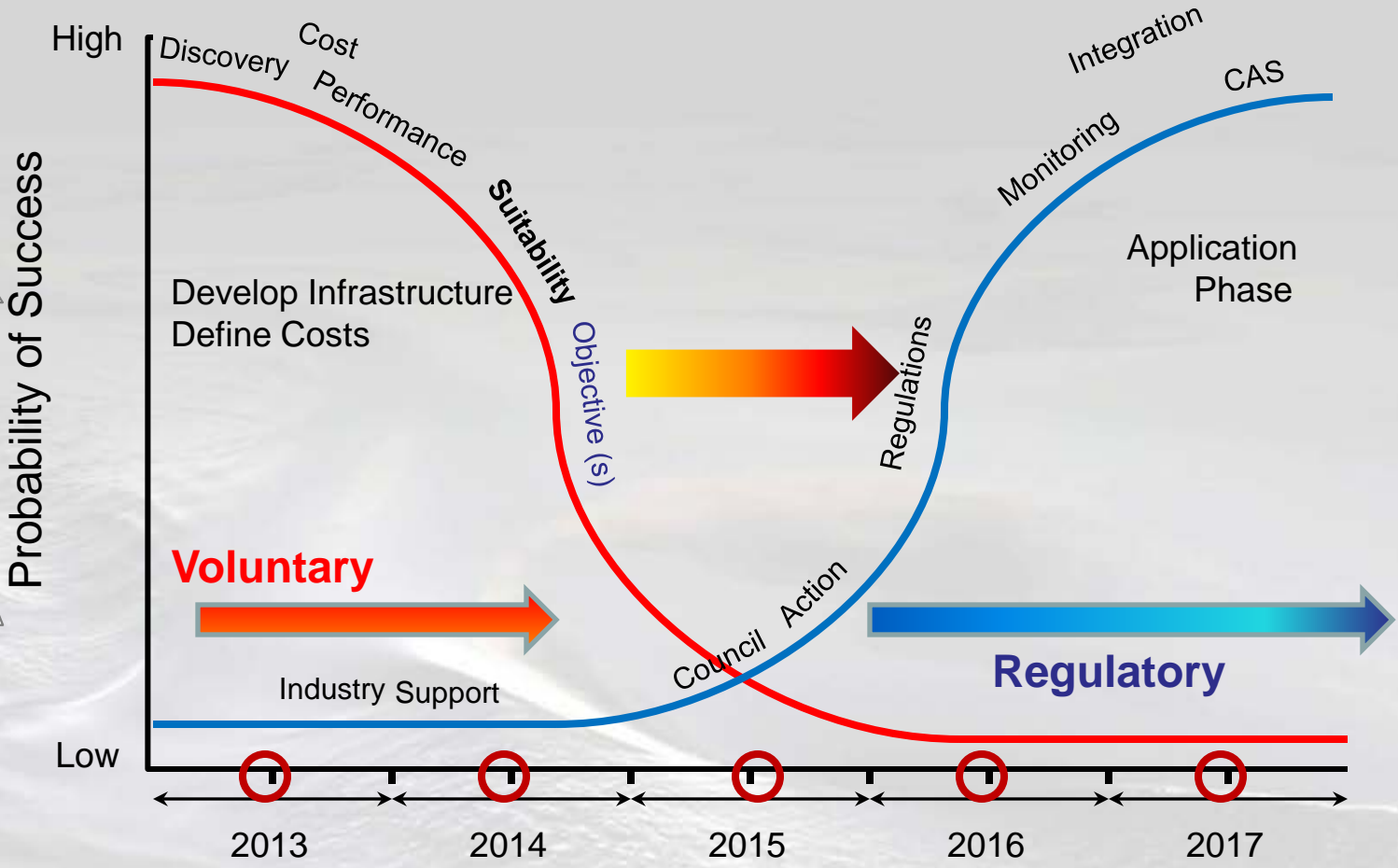
# **Goal**

**Achieve a more cost effective, adaptable and sustainable fishery data collection program and strategy that takes advantage of the full range of current and emerging technologies to meet the needs of the Industry, Council and the Agency.**

# **Steps to Integrate Technology into a Data Collection Program that supports Stock Assessment, Management and Industry**

- 1. Define the specific goal, objective and data need.**
- 2. Identify the appropriate technology to collect the data or support the data need**
- 3. Align monitoring methods with regulatory need**

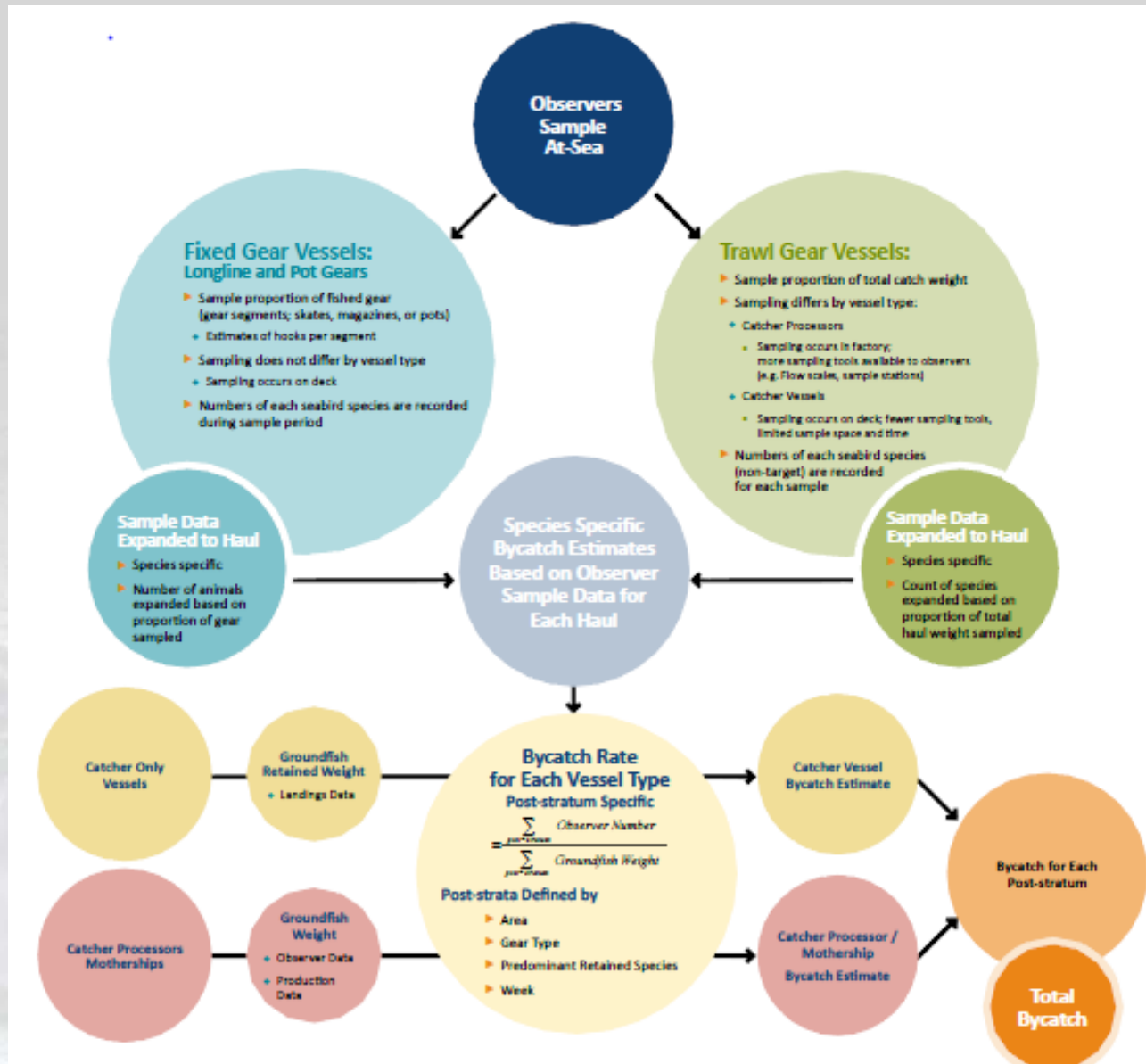
Assessment → Program Design → Pre-Implementation → Implementation



**Report to Council and Develop Objectives for EM**



# Catch Accounting System (CAS)



# Video Monitoring

- Potential where the catch is brought on board individually (gillnet, longline, and hook and line), and each specimen can be identified and total counts at varying taxonomic levels can be made.
- Effective at monitoring compliance in full retention fisheries where species identifications and weights can be determined by dockside monitors.
- May not be effective for observing catch of rare or endangered species

# More Technologies

- Electronic reporting of Effort and catch
  - Expanding Elog
  - EM Light fish effort position verified (GPS and Sensors)
  - Automated data download in near real time
  - Possible alternative to VMS?
- Image Processing
- Stereo Camera System

# Potential of future Technologies





# 2013 Observer Program

Changes to support sustainable fisheries

