NOAA FISHERIES

Alaska Region

Catch Estimation in Federal Groundfish Fisheries off Alaska

Jennifer Mondragon

NMFS Alaska Regional Office

NOAA Fisheries Science Program Review: Stock Assessment Data
(Alaska Fishery-Dependent Data)

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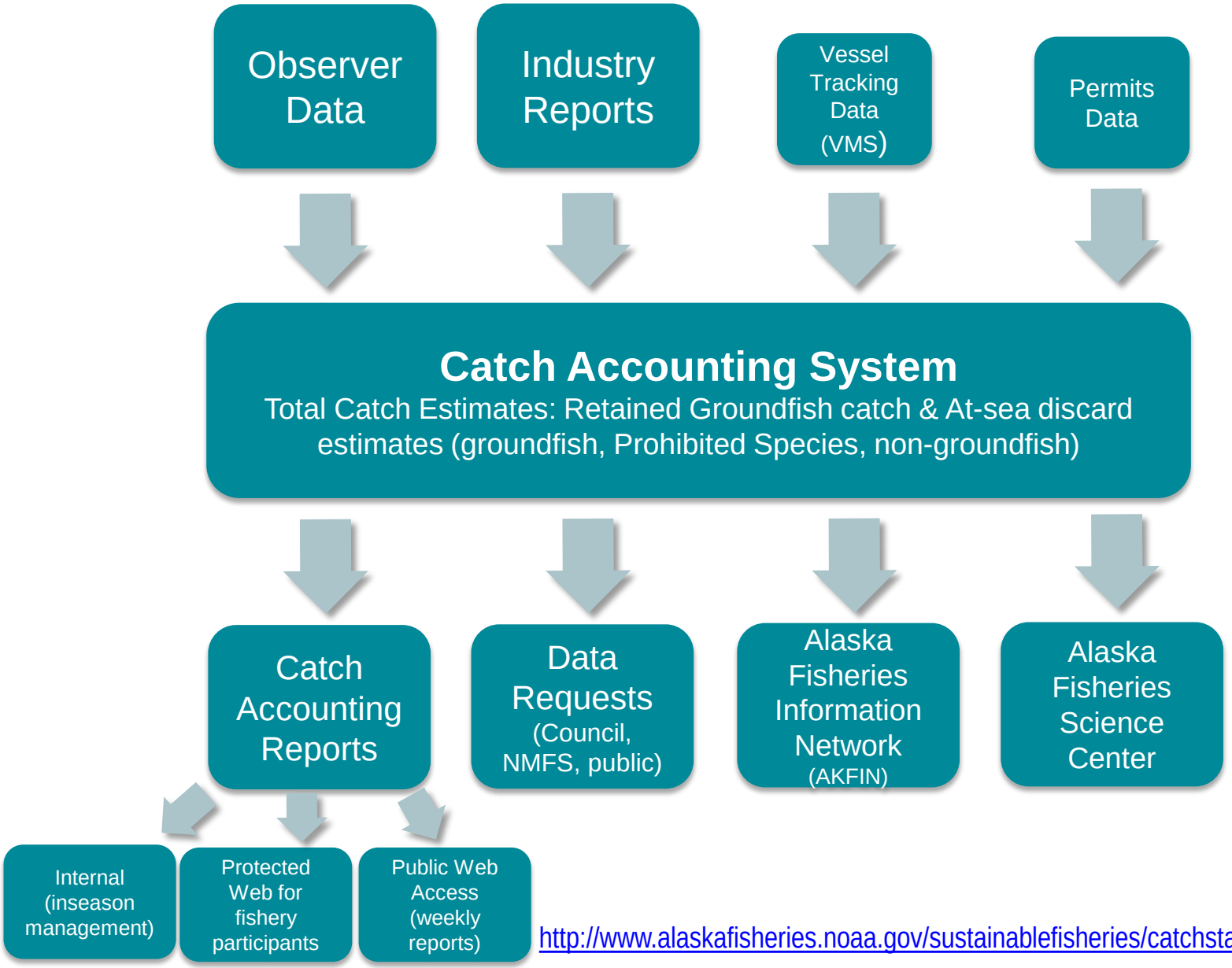
Estimation of total catch

- Catch estimates for groundfish fisheries generated by the Alaska Regional Office
  - Retained groundfish catch
  - At-sea discards
    - Groundfish
    - Prohibited Species (e.g. halibut, crab, salmon)
    - Non-groundfish species (e.g. inverts, birds, etc.)
- Designed for timely estimates to support effective in-season management
  - Enable fisheries to stay within annual catch limits set by Annual Harvest Specifications http://www.alaskafisheries.noaa.gov/sustainablefisheries/specs13_14/
  - Support policy development, analysis, & stock assessment
  - Provided to stock assessment authors through AKFIN Answers (online "data mart") or database link



http://www.alaskafisheries.noaa.gov/sustainablefisheries/catchstats.htm

Industry Data Sources

Catcher Processors

- Logbook
  - Lat/lon & time for each haul
  - Depth fished
  - Gear
  - Paper submitted to NMFS enforcement
  - eLogs submitted electronically each day

- Daily Production Report
  - Gear, area fished
  - Weight of each species by product
  - “Product Recovery Rate” → round weight of fish caught
  - Weight of species that were discarded at sea
  - Submitted electronically each day

Industry Data Sources

Catcher Vessel

- Paper Logbooks

Shoreside Plant

- Landing Report (fish ticket)
  - For each catcher vessel delivery/trip
  - Weight of the delivered fish by species, gear, area fished
- Daily Production Report
  - Summarizes a day: weight of product for each species by FMP region (no vessel, no area fished)
  - Used for economic analysis

Mothership

- Daily Production Report
- Landing Report
  - For each catcher vessel delivery

Industry Data Sources

Catcher Vessel

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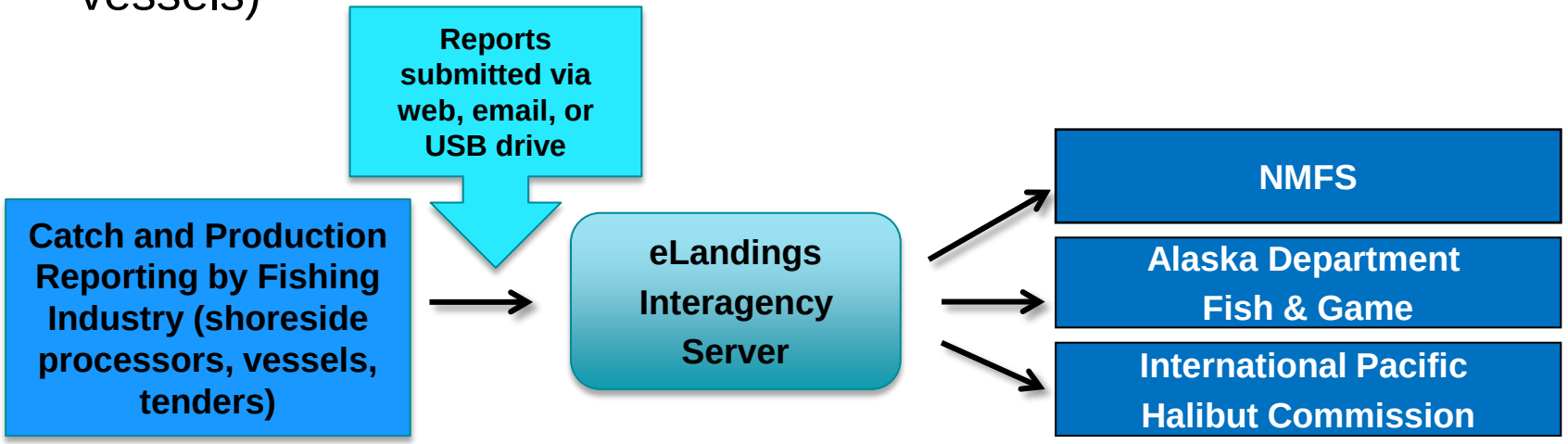
Mothership

- Daily Production Report
- Landing Report
  - For each catcher vessel delivery

Submitted electronically at time of delivery

Alaska Interagency Electronic Reporting System

- One-stop reporting to all 3 fishery management agencies in Alaska
- Single “authoritative” source of landings, logbooks, & production information available to processors and agency staff
- Increases timeliness and accuracy of fisheries data
- Electronic reporting required for all groundfish fisheries
- Enables electronic submission of landing reports (mandatory), production reports (mandatory), logbooks (not yet required for all vessels)



Data source to estimate total catch

Coverage Stratum	Fishing Sector	Retained Catch	At-sea discard of Groundfish	At-sea discard of non-groundfish and PSC
Vessel Selection (zero coverage)	Catcher vessels under 40ft LOA or fishing jig gear	Landing report	Discard rate from observer data applied to landing report	Discard rate from observer data applied to landing report
Vessel Selection (partial coverage)	Fixed gear catcher vessels >40ft and <57.5ft & not fishing jig gear delivering shoreside	Landing report	Discard rate from observer data applied to landing report	Discard rate from observer data applied to landing report
Trip Selection (partial coverage)	• Trawl catcher vessels delivering shoreside • Fixed gear catcher vessels >=57.5ft delivering shoreside	Landing report	Discard rate from observer data applied to landing report	Discard rate from observer data applied to landing report
	exempted Catcher Processors (2 vessels)	Production report	Production report	Discard rate from observer data applied to production report
Full Coverage Vessels	Catcher Processors, Motherships, & vessels participating in certain fisheries (AFA, Amend 80, etc.)	Observer data	Observer data	Observer data

At-sea discard estimates

- Sampled hauls aggregated (post stratified)
  - Time, Fishery Target species, Gear, Area
- Ratio (discard “rate”):

  sum at-sea discard for a given species in sampled hauls / total retained groundfish of all species in sampled hauls
- Ratio applied to sum of retained groundfish catch reported on landing reports for each strata

- Description of catch estimation methods:

  Cahalan, J., J. Mondragon, and J. Gasper. 2010. Catch sampling and estimation in the Federal groundfish fisheries off Alaska. U.S. Dep. Commer., NOAA Tech. Memo. http://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-205.pdf
- In progress: updated description of methods including changes from restructured observer program

Strengths

- Timely data available for total catch estimation
  - Successful collaboration between 3 management agencies to accomplish one-stop electronic reporting of industry reports
  - Observer data reported and transmitted electronically
- Restructured observer program expanded to previously unobserved vessels & reduced bias by implementing sampling design to deploy observers
- QA/QC processes throughout the process increase data quality
  - Industry reports: validation (e.g. permits), auto fill (vessel name), sanity checks, hard errors
  - All 3 management agencies checking data
  - Observer data: debriefing, in-season advising, built in QC scripts
- Timely catch estimates enable effective in-season management & catch share management programs

Challenges & Next Steps

- Industry Reports
  - Logbook data provide effort and detailed spatial information not otherwise available on unobserved trips;
  - Paper logbooks not entered into database
  - elogbooks not required for all catcher processors; Very limited elogbooks from catcher vessels
  - Expand electronic reporting requirements for logbooks
- Improvements to estimation
  - Ongoing evaluation of catch estimation methods: collaboration between AFSC and AKRO
  - Evaluating alternative estimators of catch and at-sea discards (ratio estimation, simple mean estimators, other)
    - Cahalan, J.A., J. Gasper, & J. Mondragon. In prep. Catch estimation in the federal trawl fisheries off Alaska: A simulation approach to compare the statistical properties of the simple mean estimator, a deterministic imputation method, and the ratio estimator.
  - Development of variance estimators
  - Evaluate post-stratification, investigation of alternative post-stratification schemes