

Comprehensive Analysis of Statistical Precision of U.S. Bycatch Estimates

Persistent Uncertainty and Future Priorities

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Alaska Sea Grant Bycatch Symposium

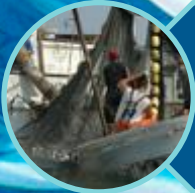
Anchorage, May 13 - 16, 2014



Where We're Going



Where We're Going



Importance of Quality Data



Goals + Caveats



National Law + Guidance



Data Sources



Results



Policy Implications



Recommendationss

In the World of Data Quality



Good Data is Better

- Accuracy and precision – everyone benefits
- With poor quality data – would be like managing a business without having the information to balance your books



Project Goal

- Comprehensively examine the precision of bycatch estimates across regions and fisheries in the U.S.



A Few Caveats...

- Yes, Oceana is an NGO
- Data access and stakeholders

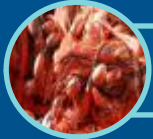


Requirements and Guidance



Legal Requirements

- Standardized Bycatch Reporting Methodology under MSA
- Progress is slow to date



National Guidance

- 2004 NMFS Tech Memo established precision goals for Coefficients of Variation (CVs):
 - Fishery level: 20 – 30% CV for total discards aggregated across all species
 - Stock level: 20 – 30% CV “encouraged”
 - Protected species: 20 – 30% CV for each stock
 - Should be flexible depending on feasibility and management needs



Are we meeting these goals?



Data Sources and Statistics



NMFS National Bycatch Report

- Compiled 940 CVs and derived means across stocks, fisheries, and regions
 - Three of six U.S. regions
 - 79 fisheries



Coefficient of Variation

- Repeatability of the mean
 - *Ex:* 30% CV means that the standard error is 30% as large as the mean estimate.
 - *Therefore,* CVs > 100% represent poor precision



Retrospective Comparison

- 2005 vs. 2010 National Bycatch Report data



Results



Overview Summary

- What data do we have?



Results



Overview Summary

- What data do we have?
 - ✓ The majority of bycatch estimates have accompanying CVs in three regions

	CV Present 2010
Northeast	53%
Southeast	62%
Southwest	100%
National	30%
Marine Mammals	74%

Results



Overview Summary

- What data do we have?
 - ✓ The majority of bycatch estimates have accompanying CVs in three regions
 - ✓ One-third are meeting the goal at best, with better performance for marine mammals

	CV Present 2010	Achieving CV30 2010
Northeast	53%	34%
Southeast	62%	10%
Southwest	100%	11%
National	30%	23%
Marine Mammals	74%	48%

Results



Overview Summary

- What data do we have?
 - ✓ The majority of bycatch estimates have accompanying CVs in three regions
 - ✓ One-third are meeting the goal at best, with better performance for marine mammals
 - ✓ Range of regional averages

	CV Present 2010	Achieving CV30 2010	Average CV 2005
Northeast	53%	34%	0.50
Southeast	62%	10%	52.50
Southwest	100%	11%	--
National	30%	23%	16.22
Marine Mammals	74%	48%	0.29

Results



Overview Summary

- What data do we have?
 - ✓ The majority of bycatch estimates have accompanying CVs in three regions
 - ✓ One-third are meeting the goal at best, with better performance for marine mammals
 - ✓ Range of regional averages

	CV	Achieving	Average CV	
	Present	CV30	2005	2010
Northeast	53%	34%	0.50 →	0.52
Southeast	62%	10%	52.50 →	1.50
Southwest	100%	11%	-- →	0.68
National	30%	23%	16.22	0.88
Marine Mammals	74%	48%	0.29 →	0.38

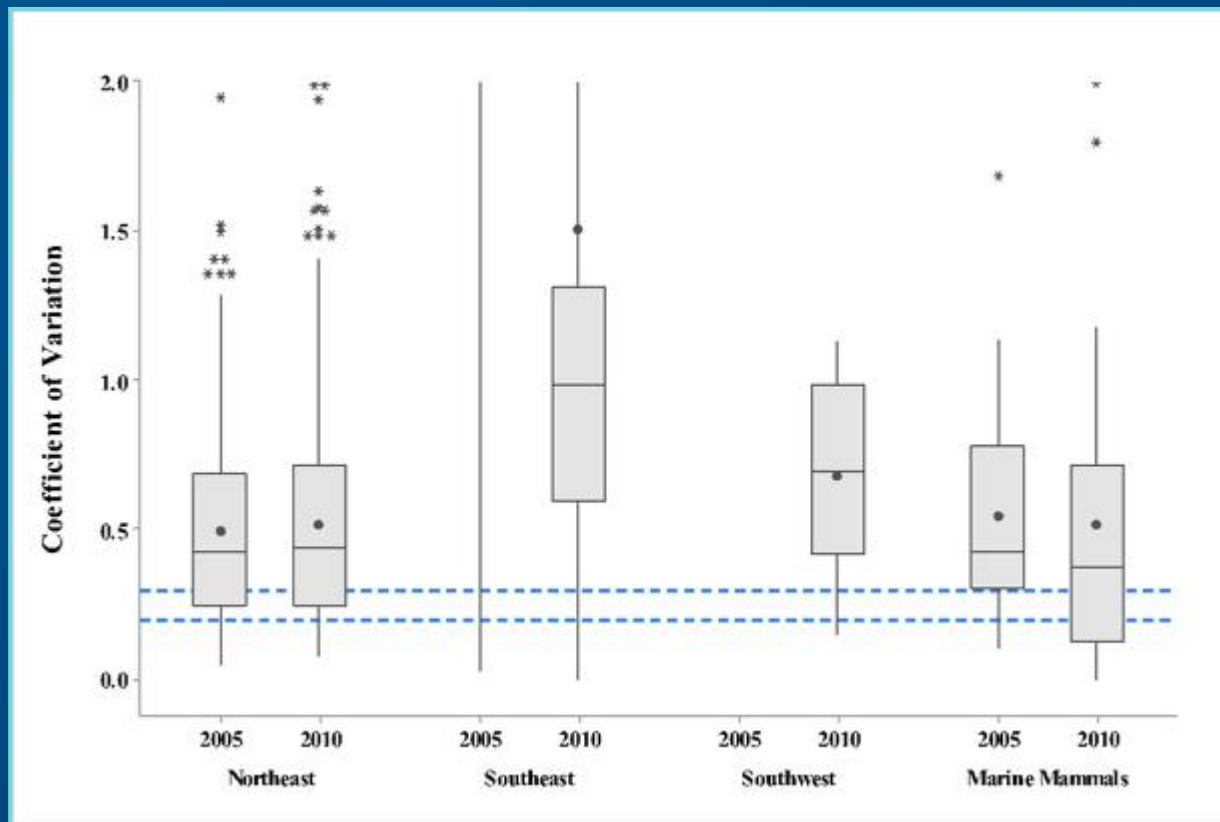
→ Despite some improvements, still far from reaching the precision goal. Everywhere.

Results



More than just means...

- Large range of CVs and outliers

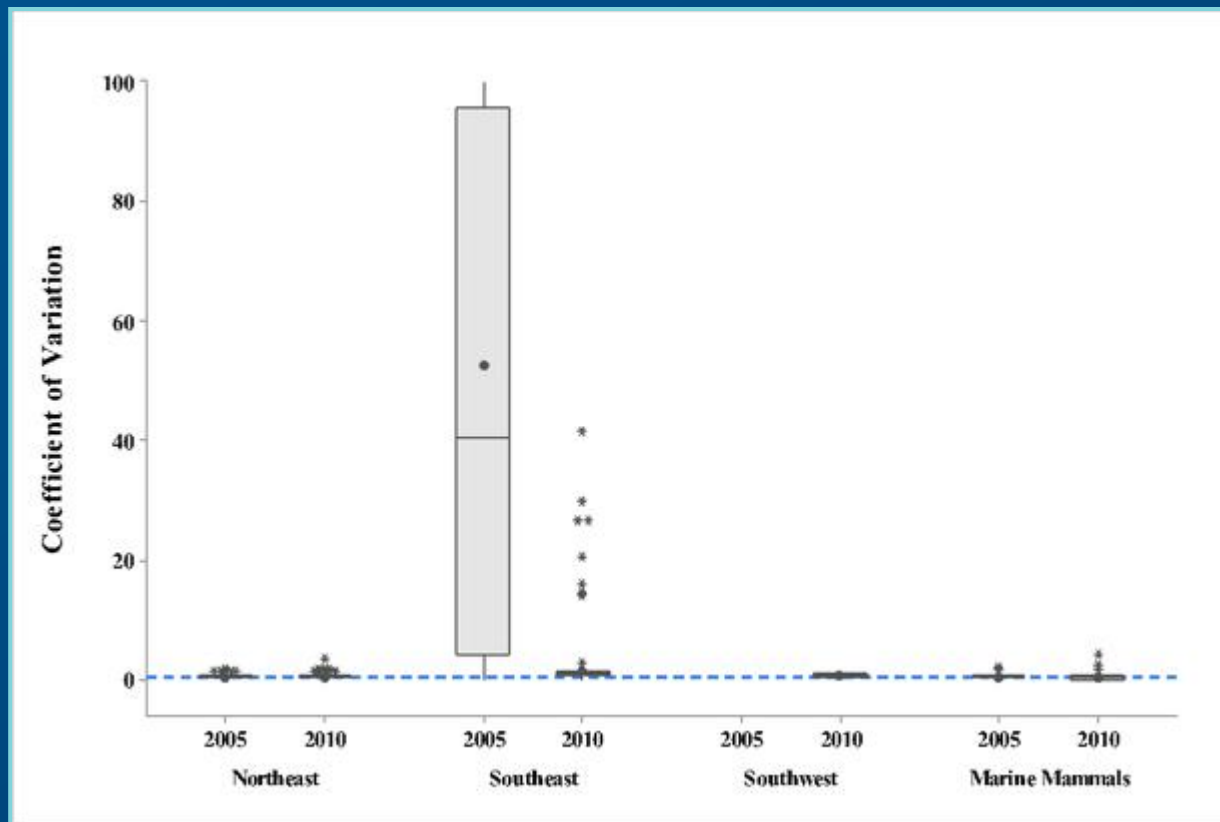


Results



More than just means...

- Large range of CVs and outliers
- Vast improvement in SE data quality



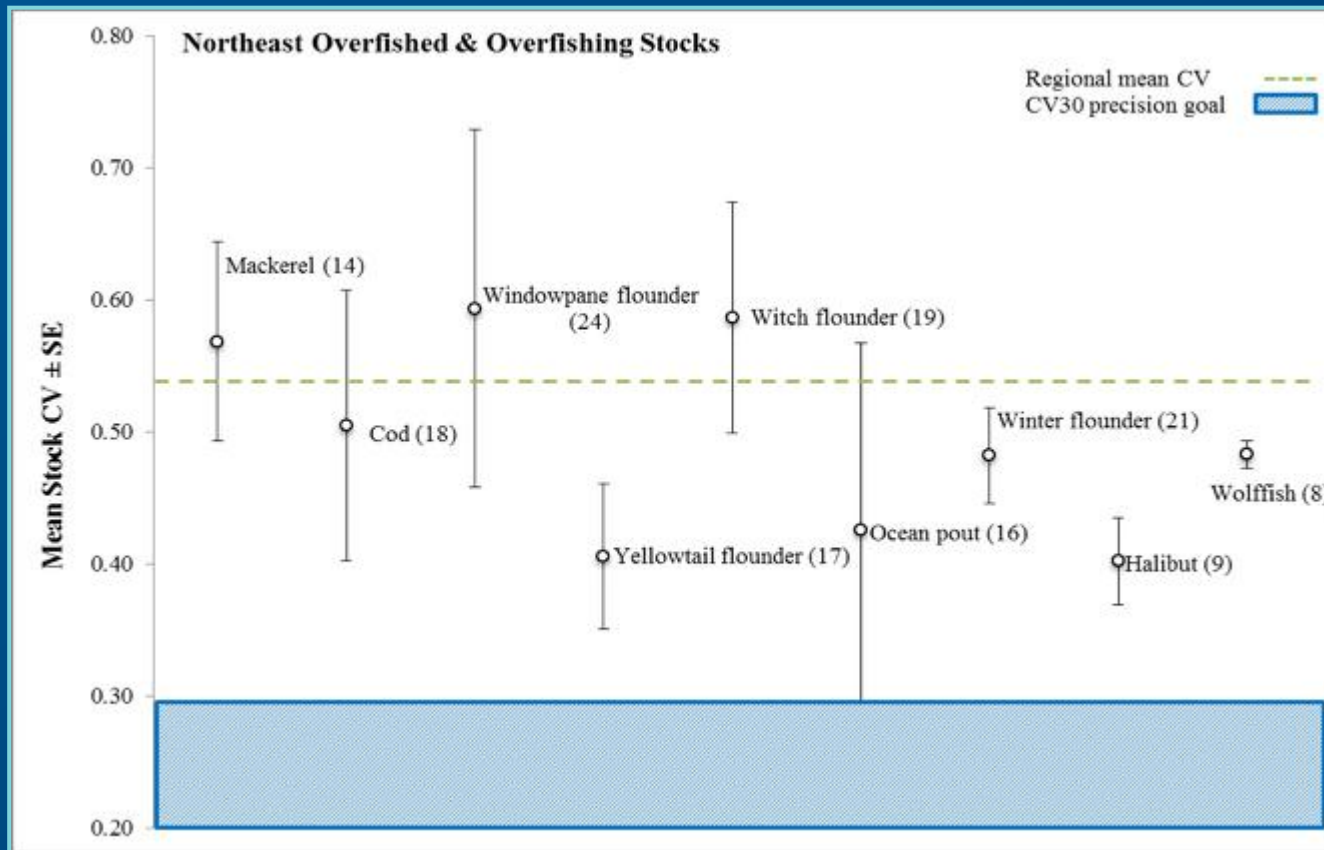
Results



Overfished stocks



- Guidance notes flexibility, but how are we doing for key stocks?



→ 40% CV for halibut means that the true bycatch level could range from 11,400 – 94,500 lbs

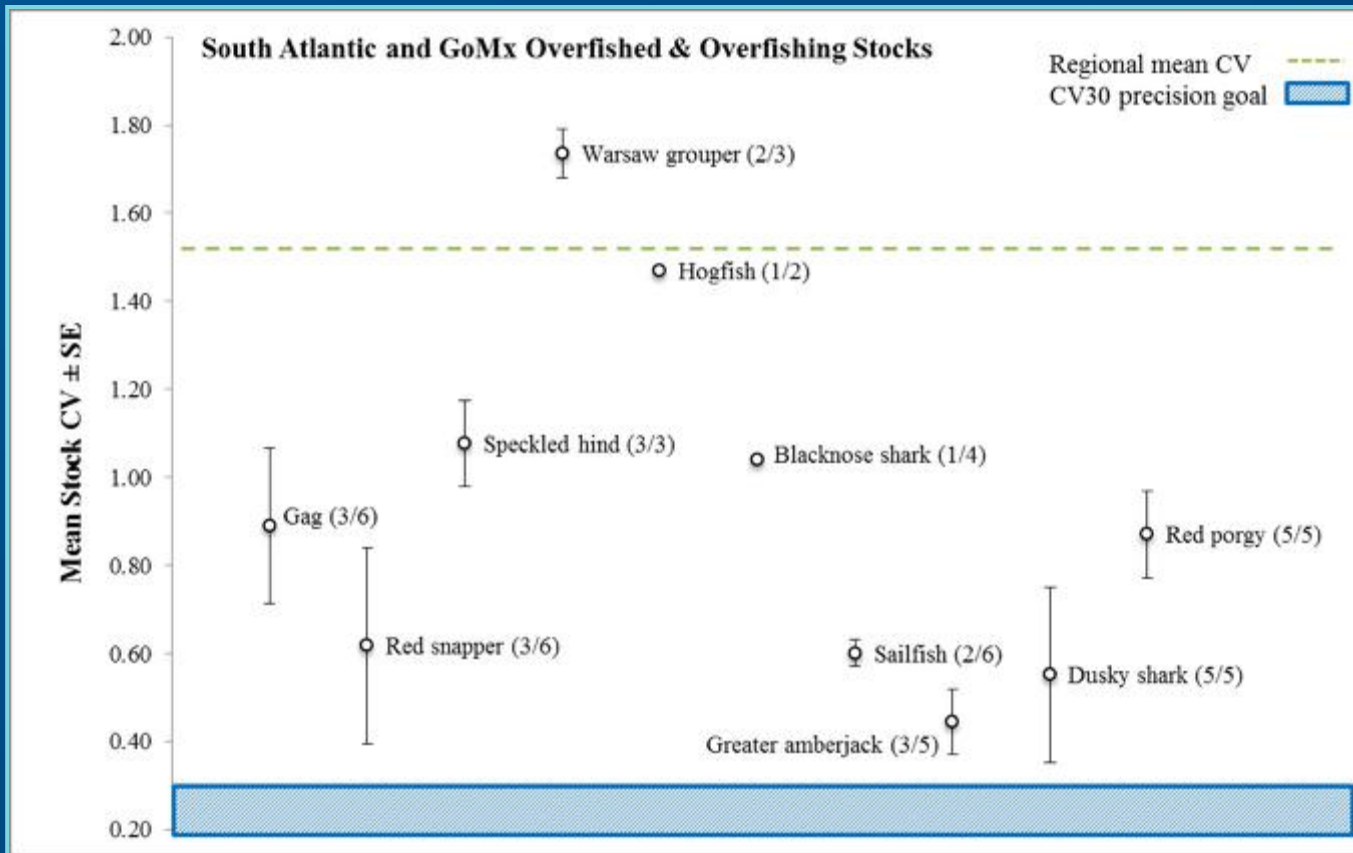
Results



Overfished stocks



- Guidance notes flexibility, but how are we doing for key stocks?



→ 170% CV for warsaw grouper would mean that -3,000 – 5,000 fish were discarded

Implications + Recommendations



Can we expect more?

- Far from achieving the performance standard, but can we expect continued improvements in a resource-limited environment?



The precision standard is a minimum goal

- Bias and accuracy are not included
- Recreational fisheries



Cost saving measures

- Find a balance between the needed improvements in data quality and cost-effective catch monitoring technology



Implications + Recommendations



Incorporating uncertainty

- Increase the buffer for management uncertainty to compensate for poor precision in bycatch estimates, especially when it is not feasible to reach the recommended precision standard through improved monitoring.



Cost-Benefit analysis

- Spending millions to catch the last 100 lbs vs. a smaller quota or larger buffer?



Focusing on key stocks

- Quantify the impacts of poor precision on the likelihood of exceeding established quotas for rebuilding/overfished stocks.

A large school of sharks swimming in deep blue water. The sharks are silhouetted against the bright blue background, creating a sense of movement and depth. The water is clear, and the sharks are densely packed, filling most of the frame.

Questions?



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