



**NOAA**  
**FISHERIES**

Alaska Fisheries  
Science Center

# Southeast Alaska Harbor Porpoise Stock: Abundance and Trends

Alexandre N. Zerbini

*Marine Mammal Laboratory AFSC-NOAA*

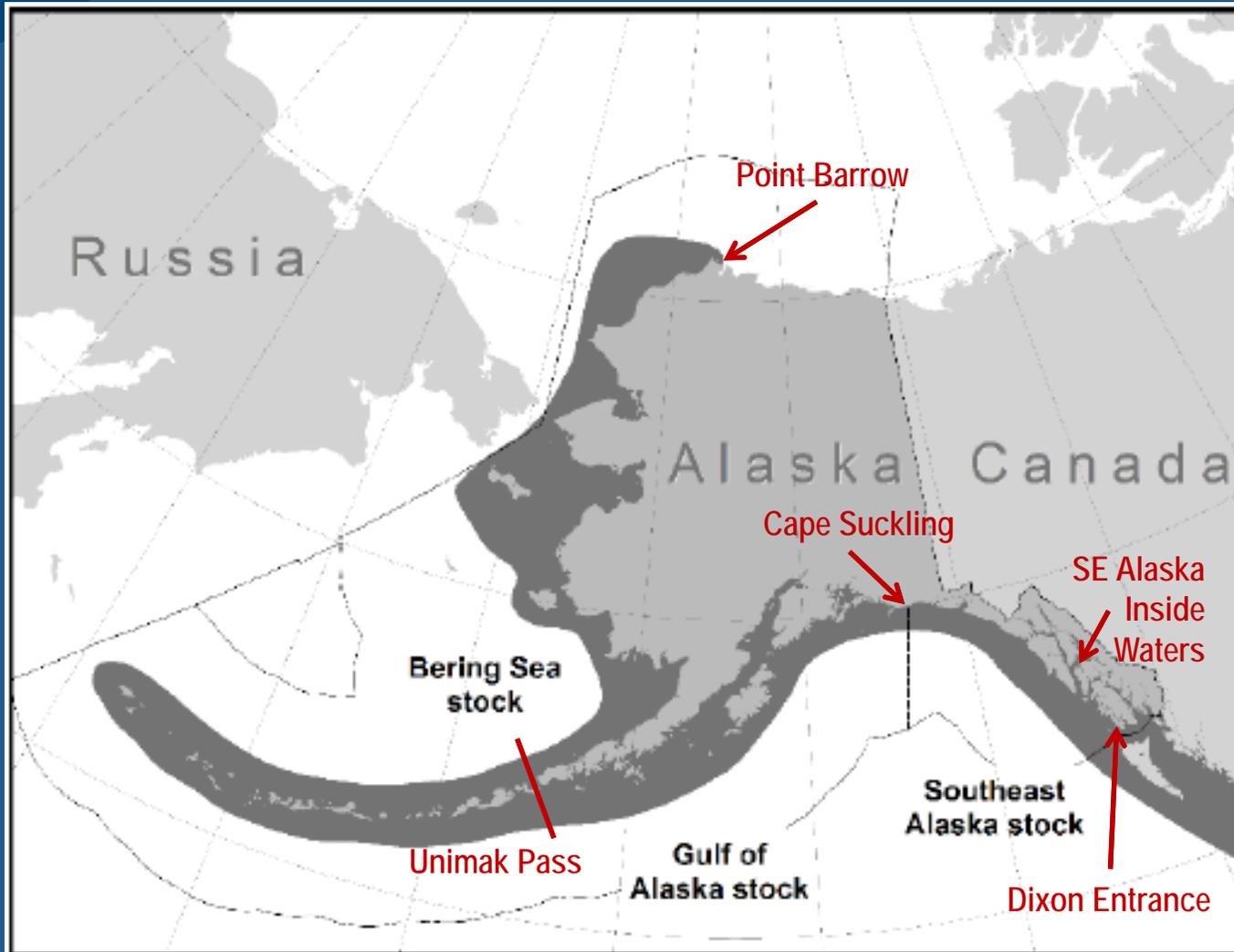
*Cascadia Research Collective*

*Marine Ecology and Telemetry Research*

31 May 2018



# Harbor Porpoise Stocks in Alaska



# Outline

- Overview on existing information on abundance and trends of the Southeast Alaska harbor porpoise stock;
- Discussion of limitations of the abundance surveys and the estimates;
- An evaluation of the effects of bycatch to potential sub-stocks within SE Alaska inland waters.

# Source: Summer Line Transect Surveys

- Aerial Surveys (1993)
- Aerial Surveys (1997):
- Ship surveys (1991-93, 2006-07 and 2010-2012):

## HARBOR PORPOISE (*PHOCOENA PHOCOENA*) ABUNDANCE IN ALASKA: BRISTOL BAY TO SOUTHEAST ALASKA, 1991–1993

M. DAHLHEIM  
A. YORK  
R. TOWELL  
J. WAITE  
J. BREIWICK

Alaska Fisheries Science Center,  
National Marine Mammal Laboratory,

## Abundance of harbor porpoise (*Phocoena phocoena*) in three Alaskan regions, corrected for observer errors due to perception bias and species misidentification, and corrected for animals submerged from view

Roderick C. Hobbs (contact author)  
Janice M. Waite

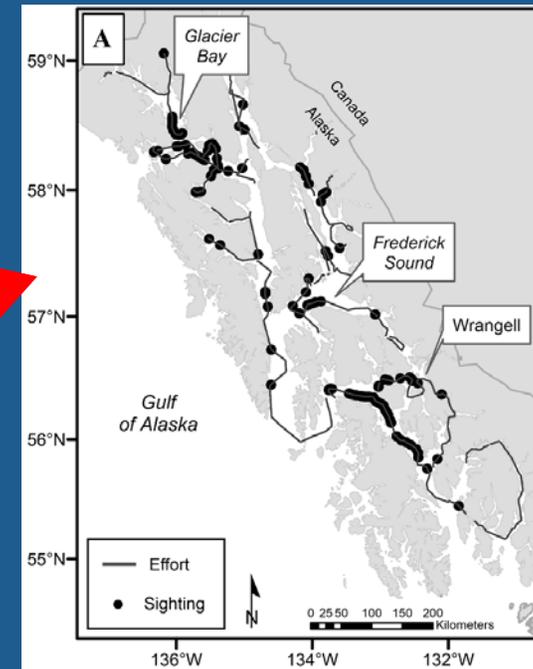
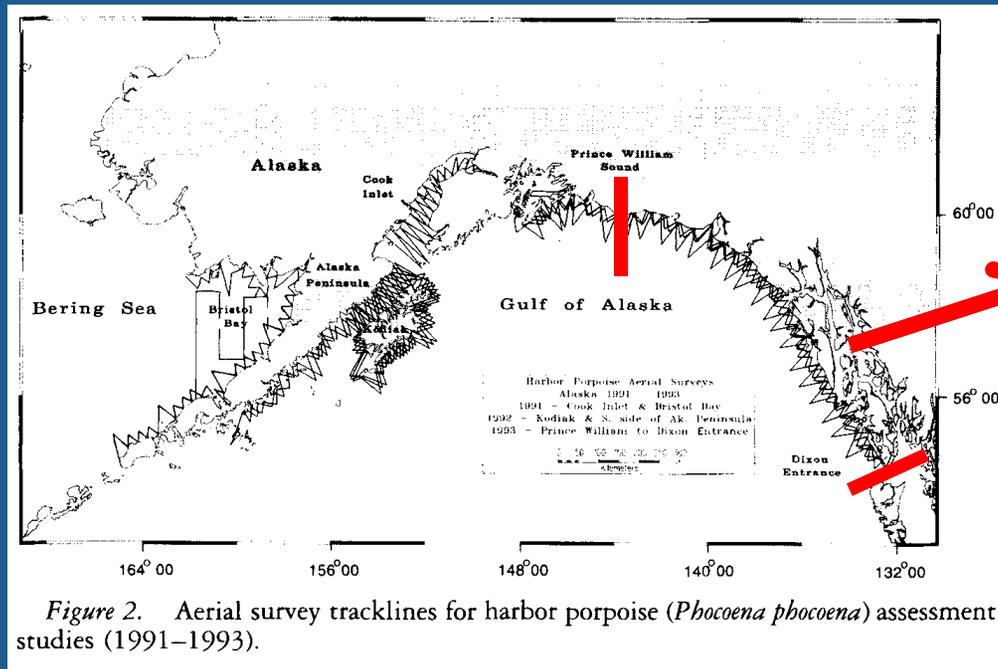
## Temporal changes in abundance of harbor porpoise (*Phocoena phocoena*) inhabiting the inland waters of Southeast Alaska

Marilyn E. Dahlheim (contact author)<sup>1</sup>  
Alexandre N. Zerbini<sup>1, 2</sup>  
Janice M. Waite<sup>1</sup>  
Amy S. Kennedy<sup>1</sup>

# Estimates

- 1993 (Aerial + Ship Surveys) (Hill and DeMaster, 1998, Dahlheim et al. 2000)

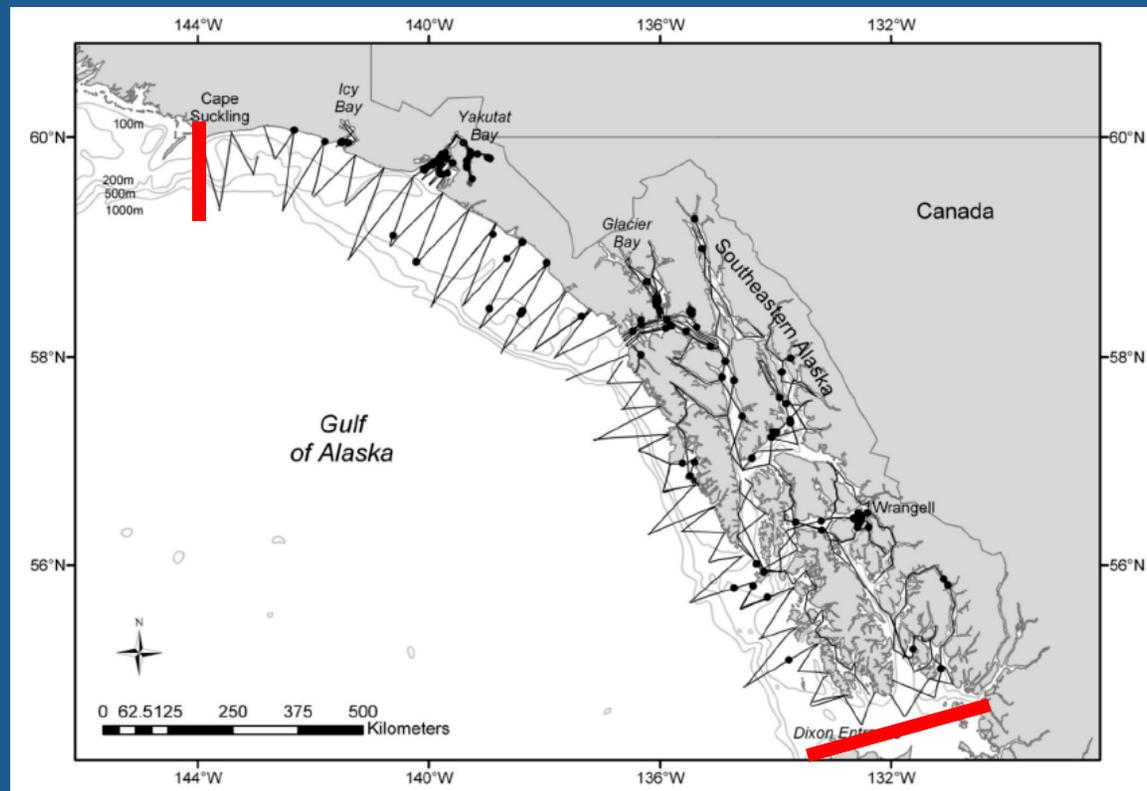
Year	N	CV	Observations
1993	10,301	0.22	Whole stock, combined aerial and ship survey, $g(0)$ assumed from the literature



# Estimates

- 1997 (Aerial Surveys) (Hobbs and Waite, 2010)

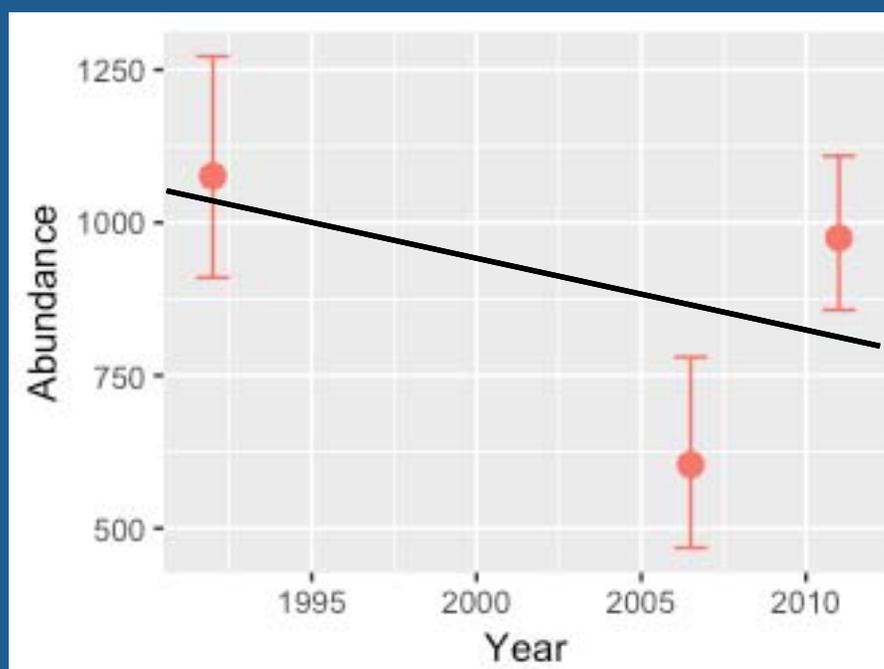
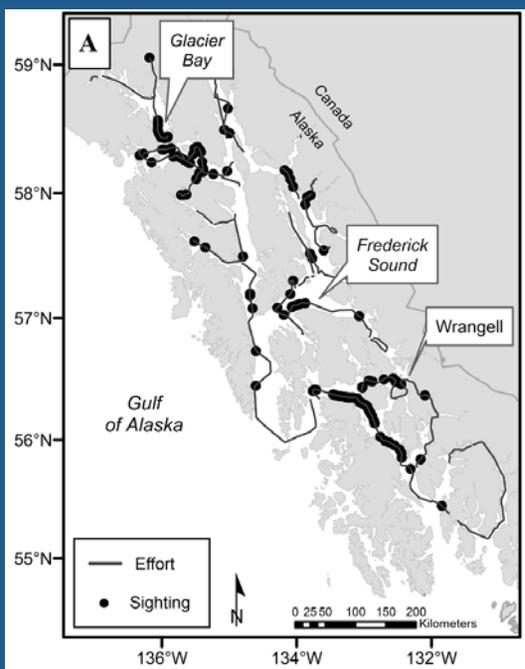
Year	N	CV	Observations
1997	11,146	0.24	Whole stock $g(0)$ computed from the surveys



# Estimates

- Ship surveys (1991-93, 2006-07 and 2010-2012) (Dahlheim et al., 2015)

Year	N	CV	Observations
1991-1993	1,076	0.13	Ship survey <b>inside waters of SE Alaska</b> , no correction factor computed, pooled across sets of years.
2006-2007	604	0.20	
2010-2012	975	0.10	

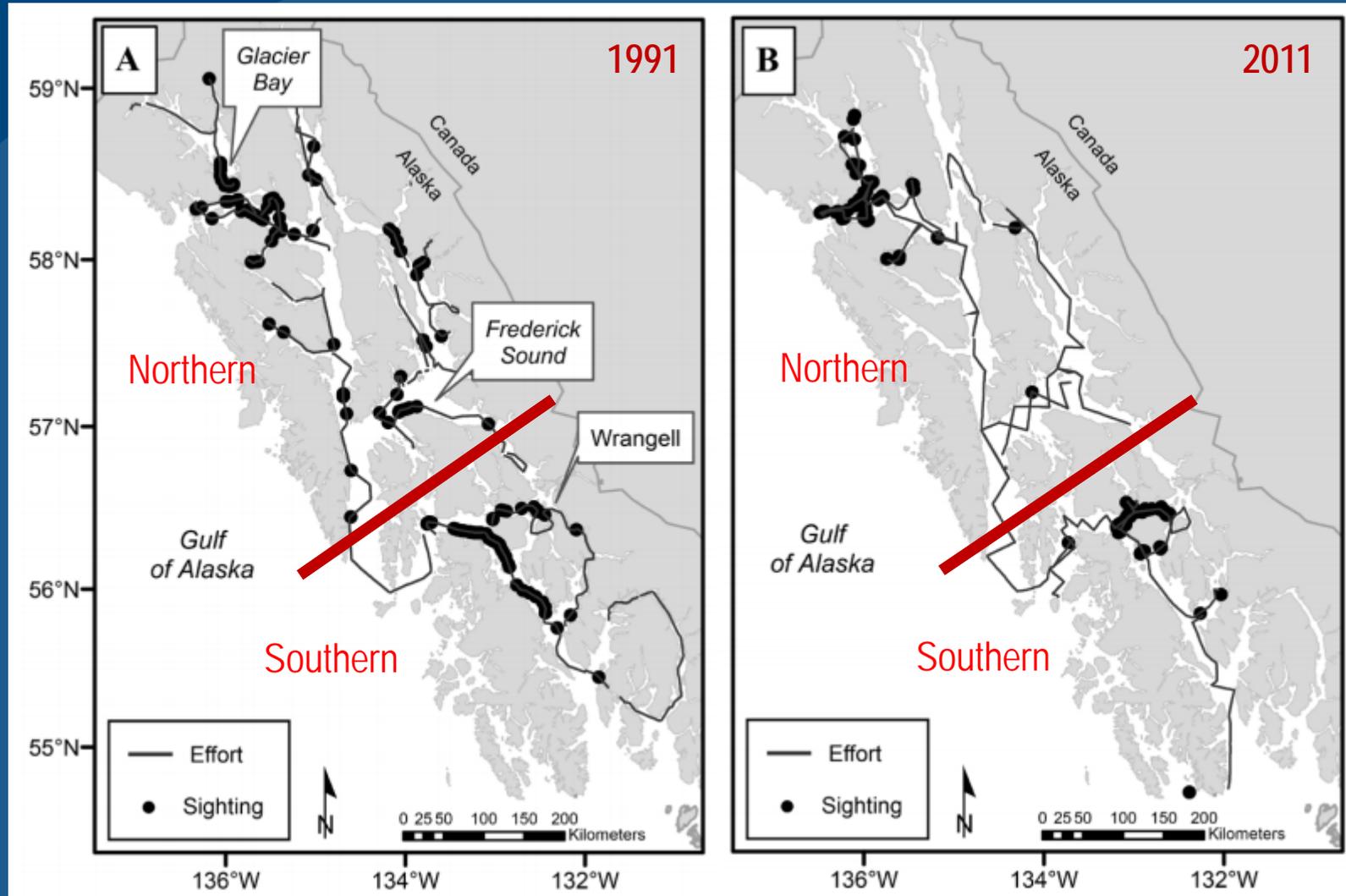


$r: \sim -1\%/yr$   
 $p = 0.71$

# Limitations of the abundance estimates

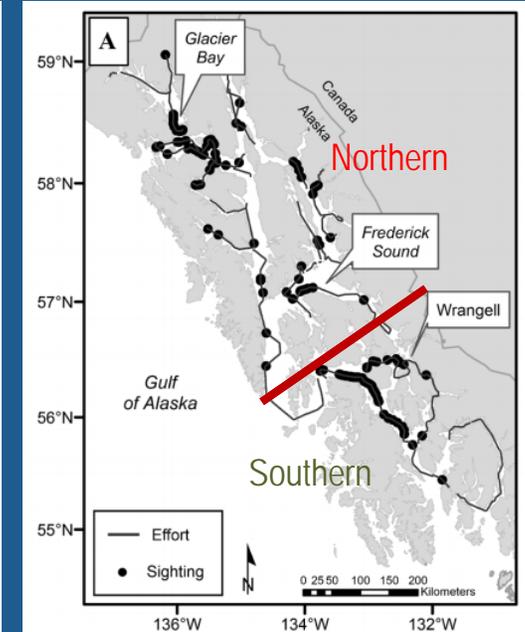
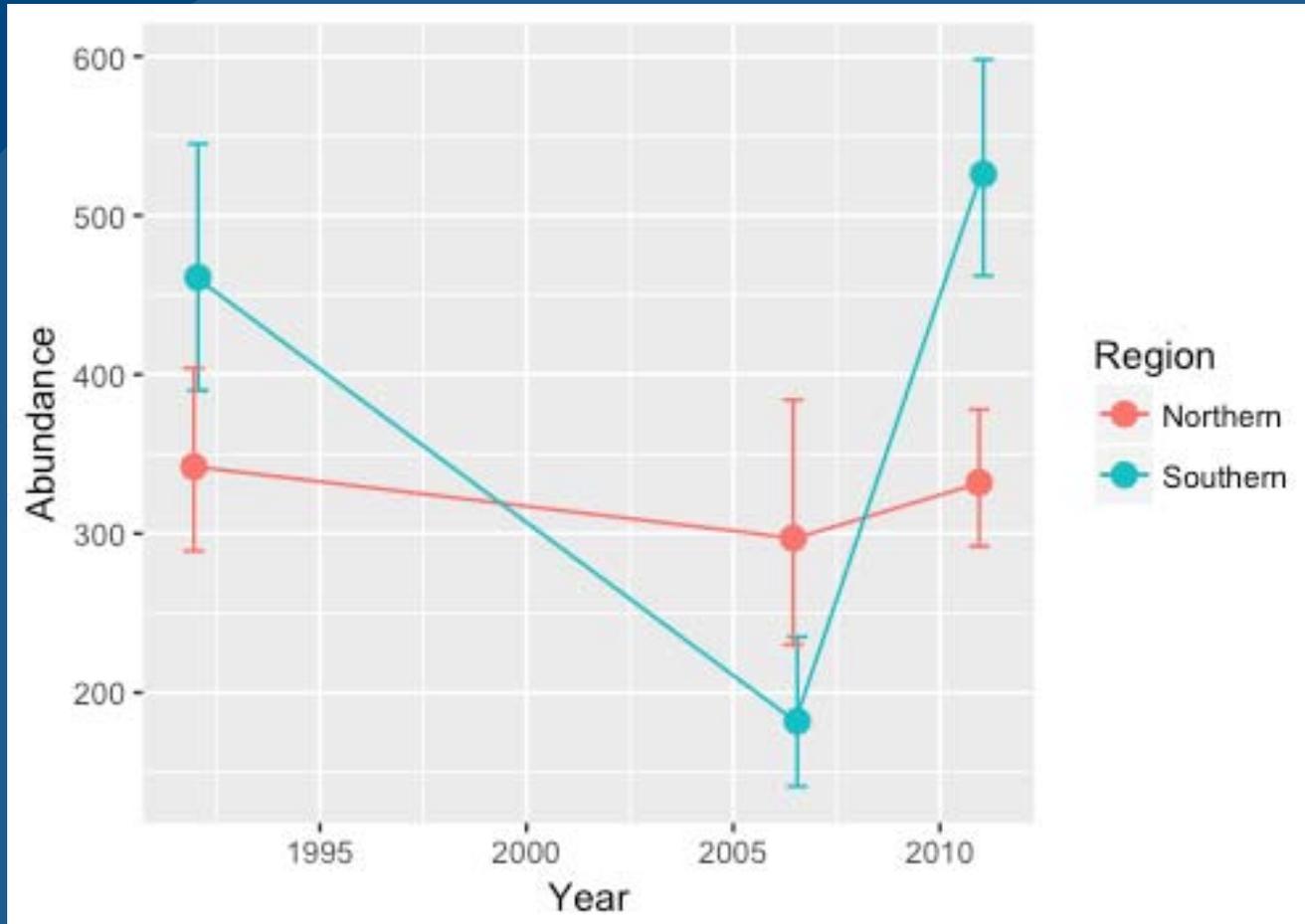
1. All Aerial Survey-Based Estimates of Abundance Estimates are 20+ years old;
2. Estimates across aerial surveys are difficult to compare: different sampling methodologies
3. Most recent ship-survey estimate (2010-2012) will be “obsolete” for management after 2019 (older than 8 years);
4. Ship surveys were not designed to sample all harbor porpoise habitat and to compute  $g(0)$ .

# Stock Assessment Consideration I



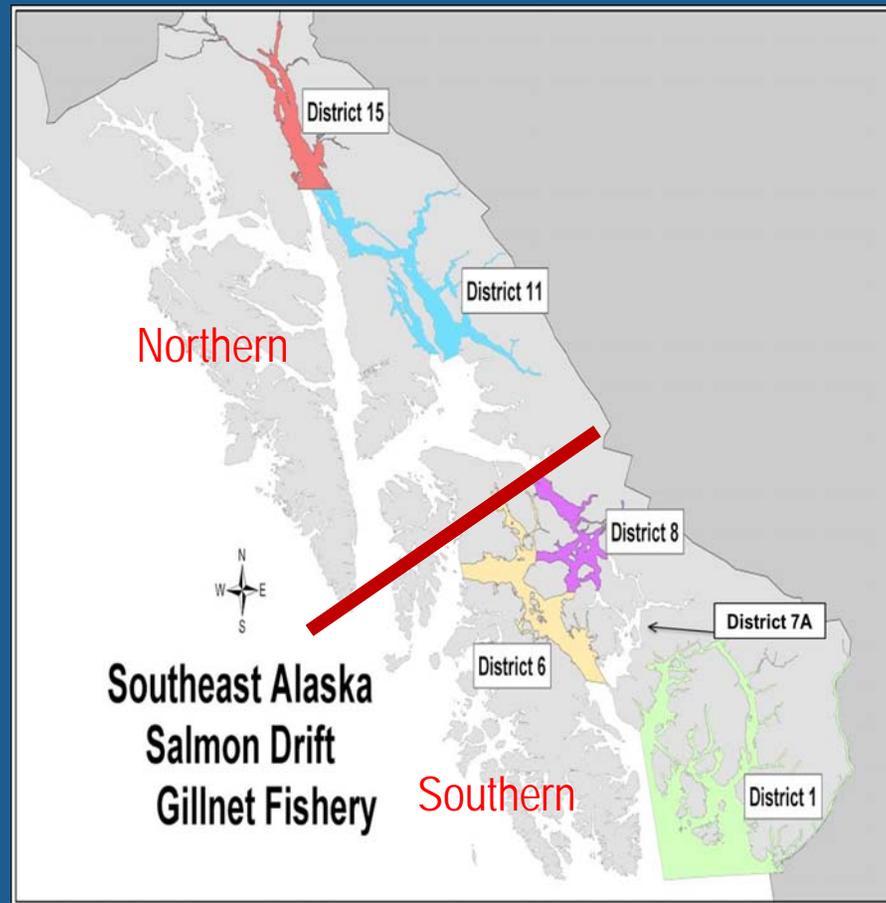
# Stock Assessment Consideration II

## TRENDS IN ABUNDANCE – SE Alaska Inland Waters



# Management Considerations

- Conflict with the Southeast Alaska salmon drift net fisheries (K. Long's talk)
- Ship surveys (2010-2012): calculation of Nmin and PBR for smaller areas



# Management Considerations

- Conflict with the Southeast Alaska salmon drift net fisheries (K. Long's talk)
- Ship surveys (2010-2012): calculation of Nmin and PBR for smaller areas

Region	N ( $g_0 = 1$ )	CV	Nmin	PBR	Annual bycatch
All inland waters	975	0.10	896	8.9	12
Northern area	398	0.12	359	3.6	
Southern area	577	0.14	513	5.1	

- If  $g(0) = 0.74$  (CV, 0.10 - weighted average of Barlow, 1988 and Palka, 1995)

Region	N ( $g_0 = 0.74$ )	CV	Nmin	PBR	Annual bycatch
All inland waters	1312	0.11	1196	11.9	12
Northern area	537	0.13	481	4.8	
Southern area	779	0.15	687	6.9	

# Future Needs for Abundance Estimation

1. New abundance survey;
2. Survey needs to sample harbor porpoise habitat consistently and cover inside and offshore waters; simultaneously
3. Concurrent estimation of correction factors for animals missed on the survey trackline  $[g(0)]$ ;
4. Allow estimation of density in smaller areas to compare to fishing effort in localized habitats

# THANK YOU