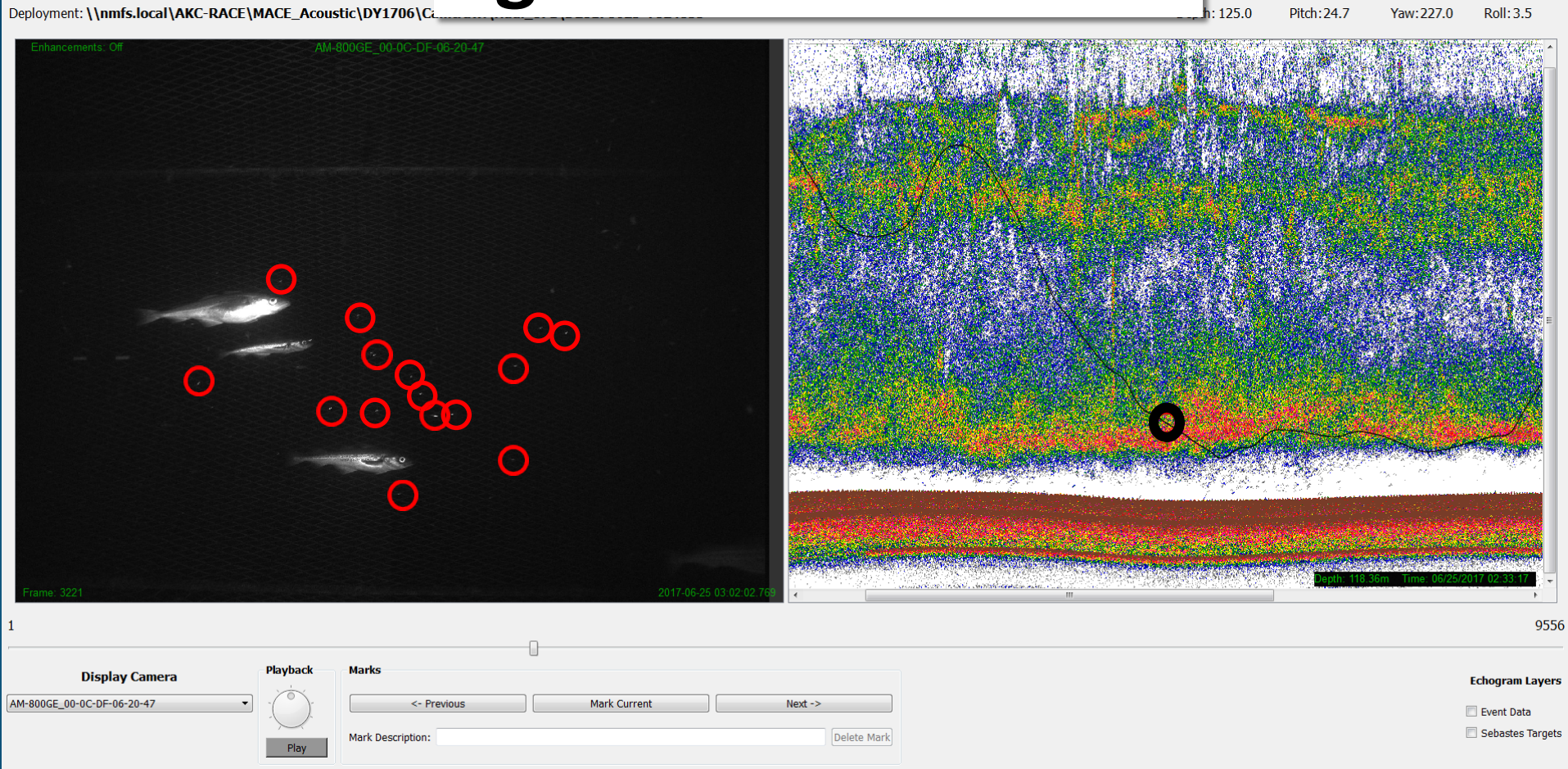


# Age-0 and 1+ Pollock



# Example Counts – Haul 71

## Codend Catch

- Adult pollock – 667 (94%)
- Age-0 pollock – 44 (6%)

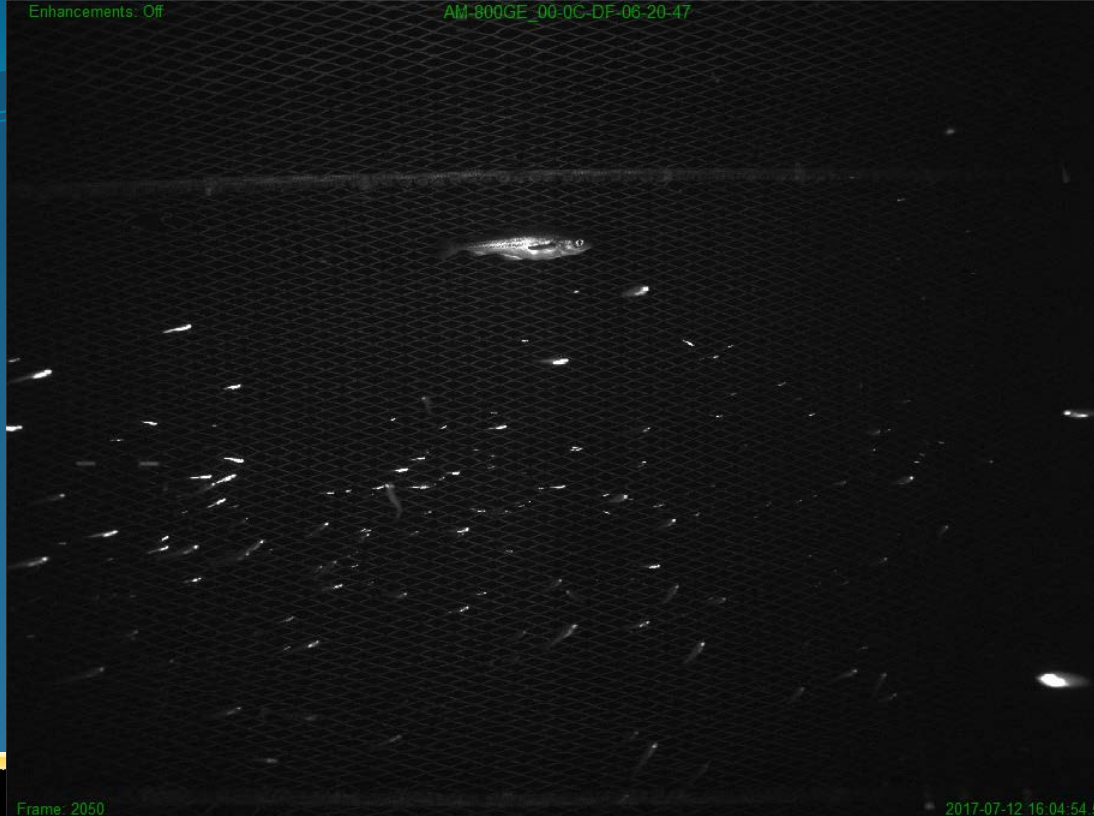
## CamTrawl Count

- Adult pollock – 104 (8%)
- Age-0 pollock – 1,156 (92%)



Enhancemts: Off

AM-800GE\_00-0G-DF-06-20-47

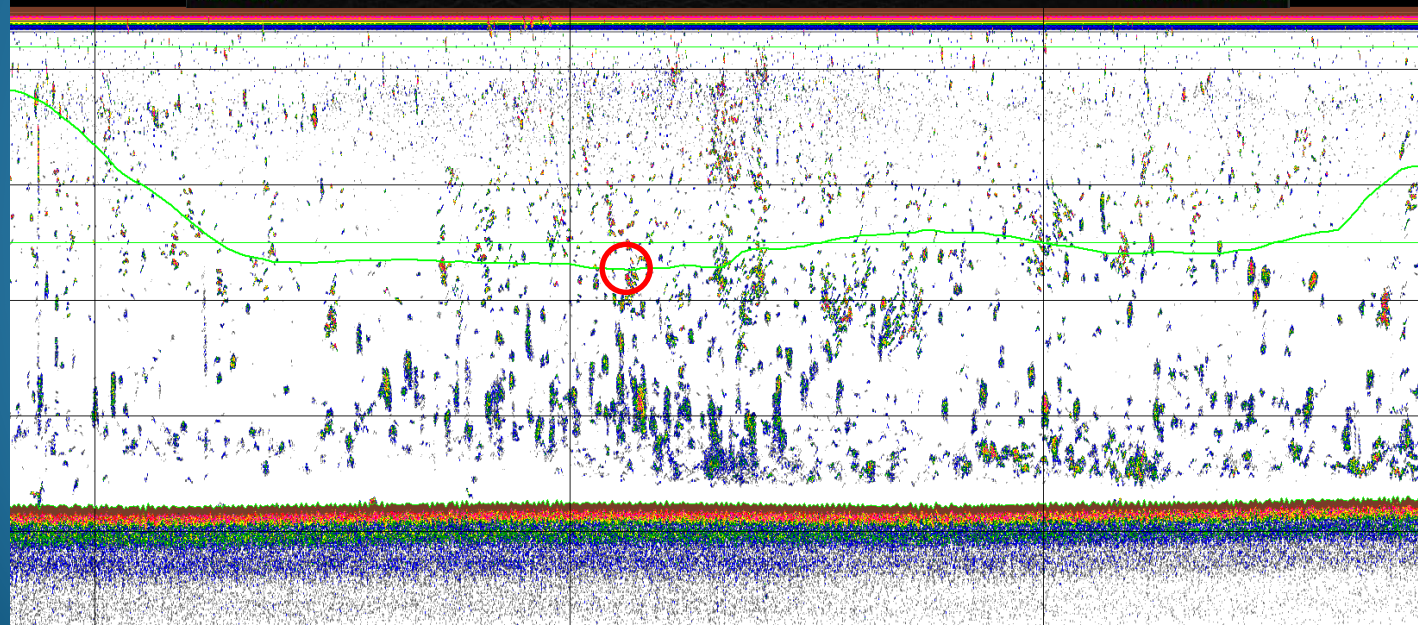


or survey

8806.0mm

Frame: 2050

2017-07-12 16:04:54.59



# Example Counts - Haul 113

## Codend Catch

- Adult pollock – 1,021 (85%)
- Age-0 pollock – 185 (15%)

## CamTrawl Count

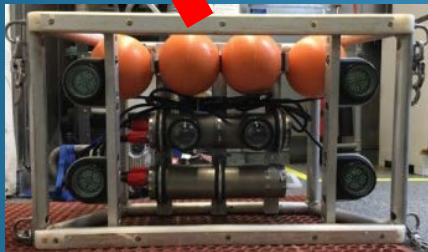
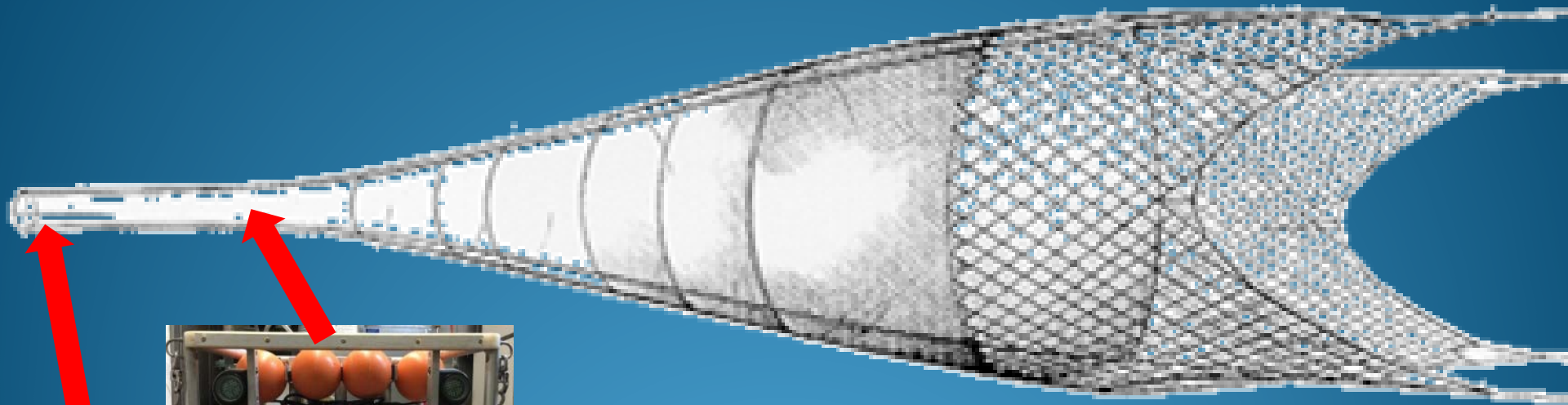
- Adult pollock – 335 (25%)
- Age-0 pollock – 1,012 (75%)

## Pollock Abundance Estimates

- No correction for mixed layers  
~2 million t
- Age-0 corrected with average  
from CamTrawl counts in mix layer  
age-0:adult ratio 36:1  
~1.8 million t

Now will present refinement

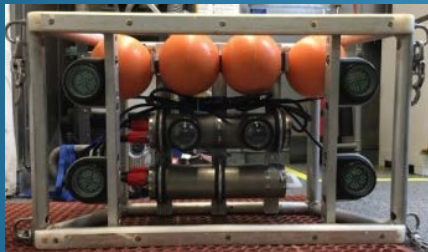
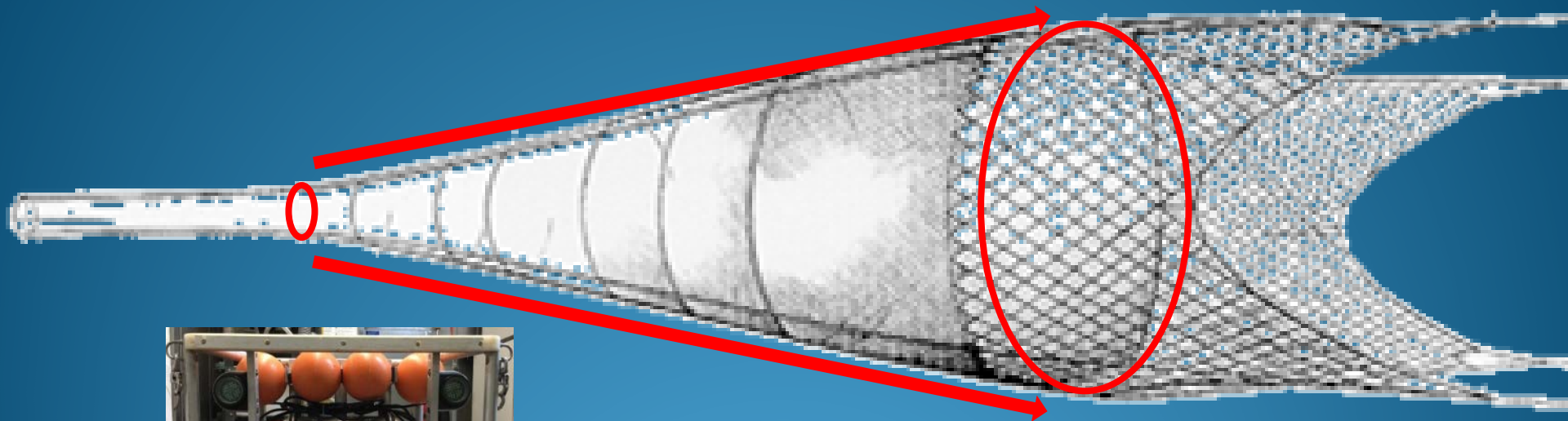
# Expansion of Age-0 Numbers



$$\begin{array}{l} \# \text{ Adults} \\ \text{in} \\ \text{codend} \end{array} \times \begin{array}{l} \text{Age-0/Adult} \\ \text{ratio in} \\ \text{CamTrawl} \end{array} = \begin{array}{l} \# \text{ Age-0} \\ \text{passing} \\ \text{CamTrawl} \end{array}$$



# Expansion of Age-0 Numbers (Assumes age-0 fish DO NOT herd)



# Age-0  
passing  
CamTrawl

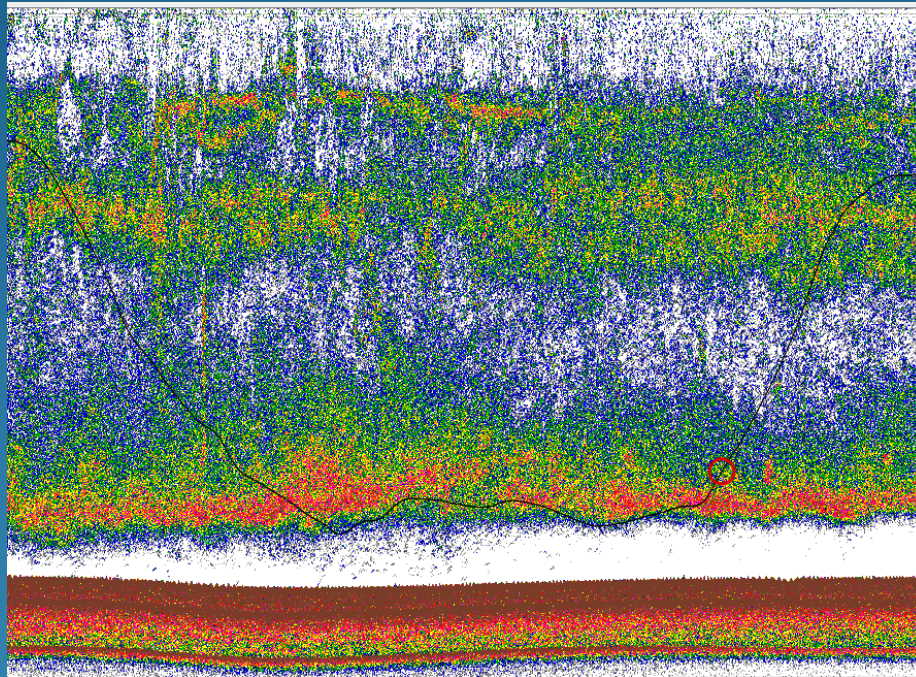
X

Ratio of Net  
Diameter at  
CamTrawl vs.  
Mouth Opening  
(~175x)

=

# Age-0 in  
Trawl Path

# Estimating backscatter from age-0



Amount of  
backscatter  
attributed to  
Age-0 in that  
area

=

Age-0  
backscattering  
cross section  
( $\sigma$ )

x

# Age-0 in  
Trawl Path

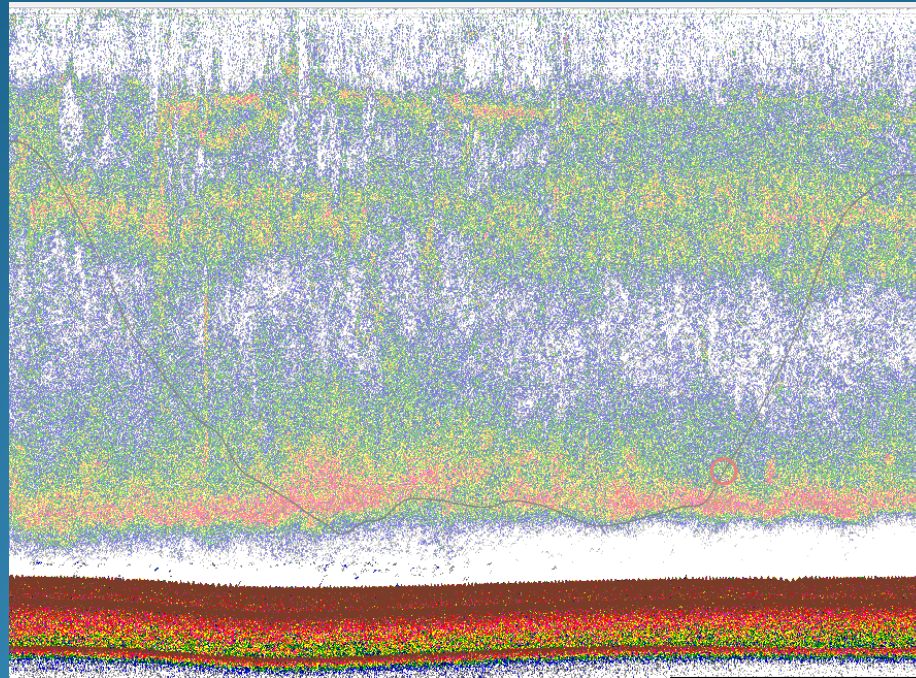


# Proportion of Backscatter from Age-0 Pollock

$$PB_{age0} = \frac{\sigma_{Age0} \cdot \#_{Age0}}{\sum_s (\sigma_{all\ species} \cdot \#_{all\ species})}$$

# Age-0 Backscatter Removed

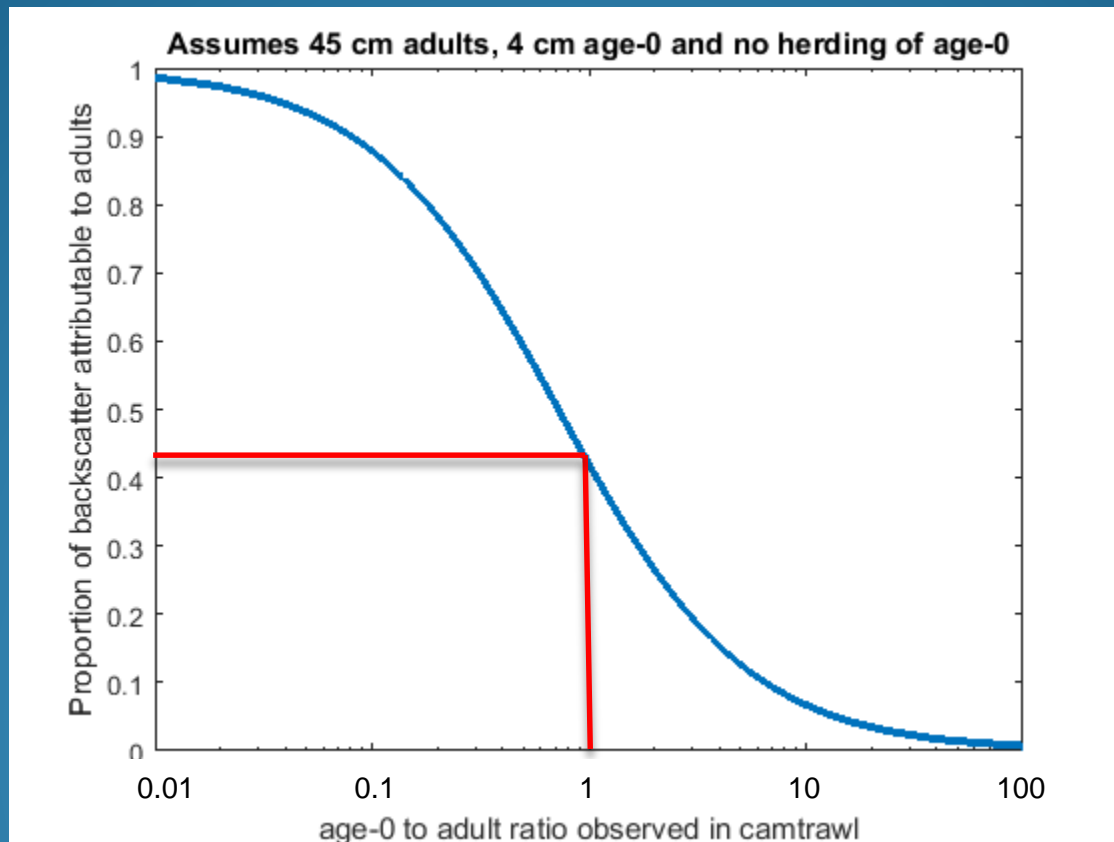
Backscatter  
is reduced  
to account  
for age-0  
fish not  
retained in  
trawls



$$(1 - PB_{\text{age-0}}) \times \text{Total backscatter} = \text{Backscatter with age-0 contribution removed}$$

$PB_{\text{age-0}}$  is the proportion of backscatter attributable to age-0 pollock

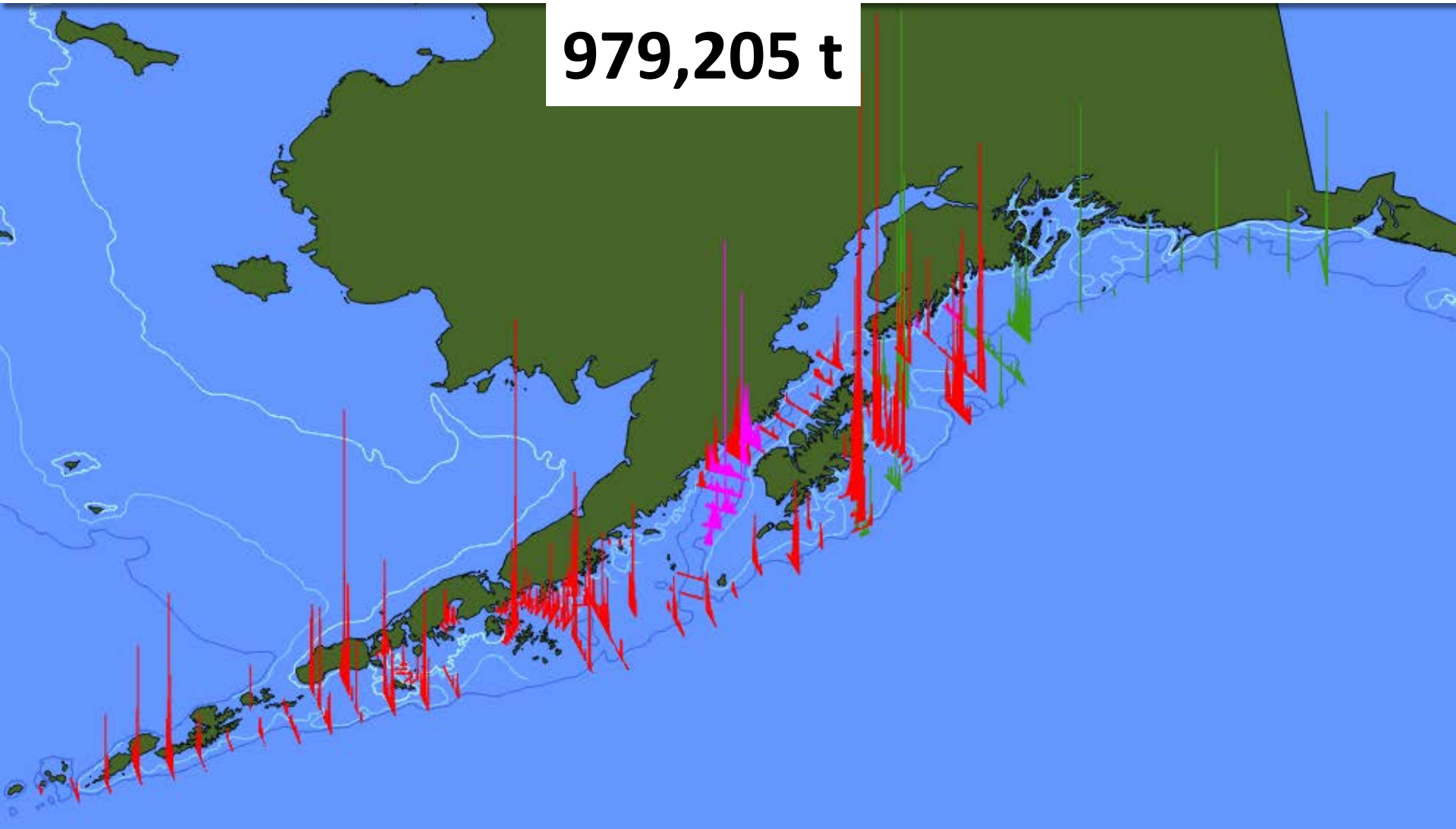
# Extrapolating from CamTrawl to Net Opening





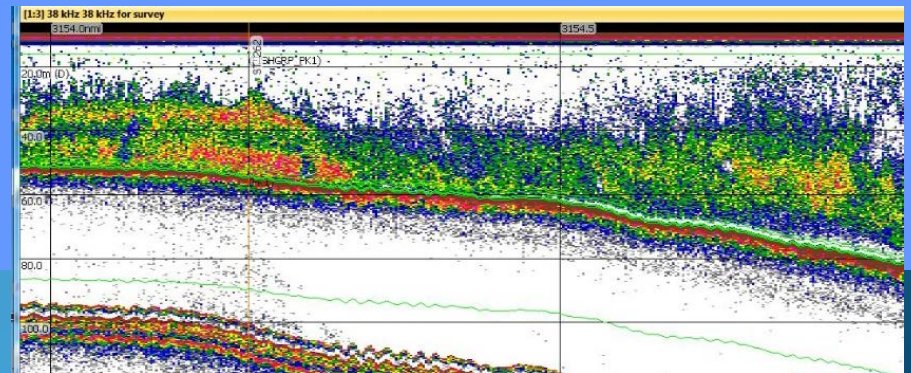
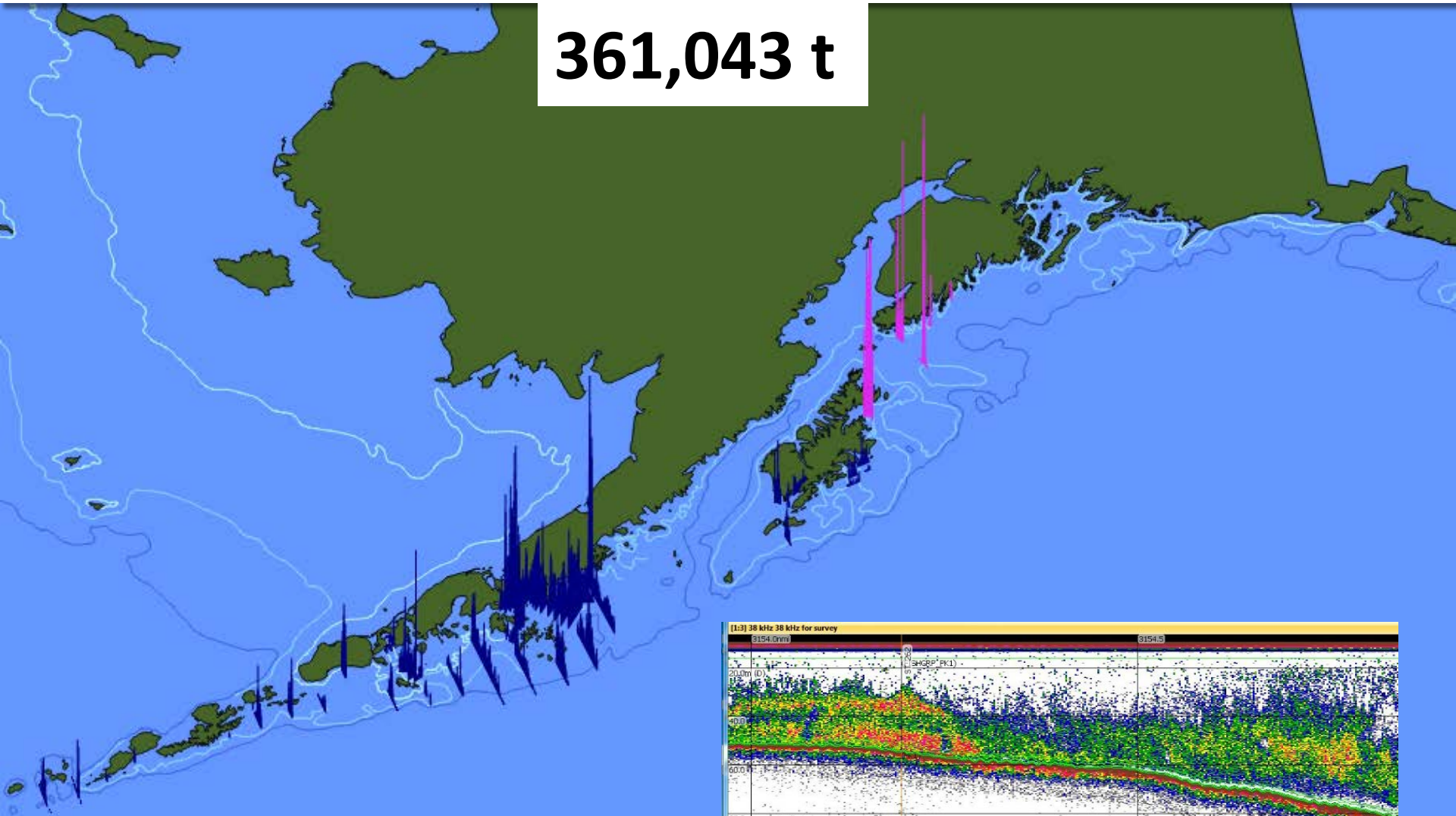
# Age1+ Pollock from areas with few age-0's

979,205 t

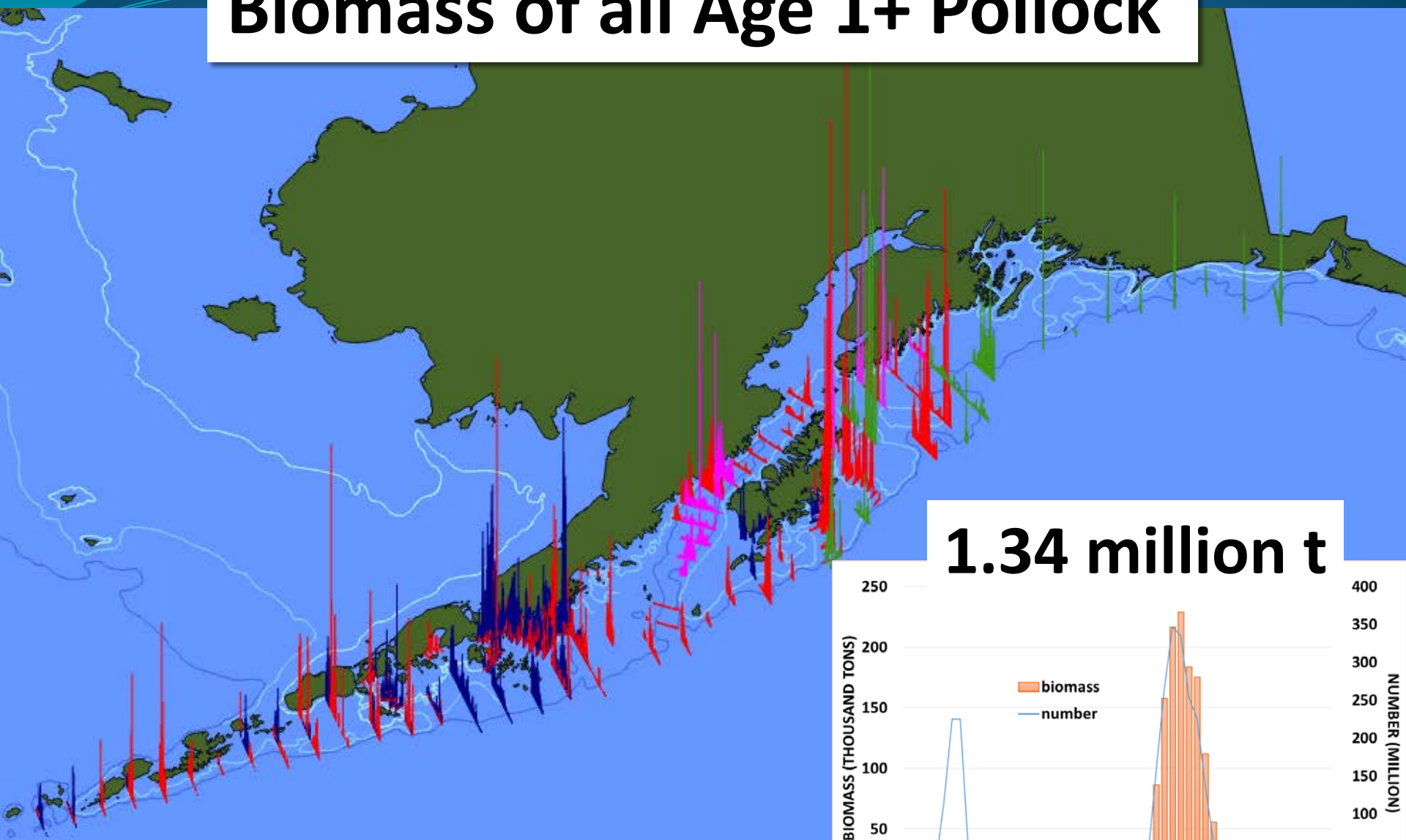


# Age1+ Pollock from areas containing age-0's

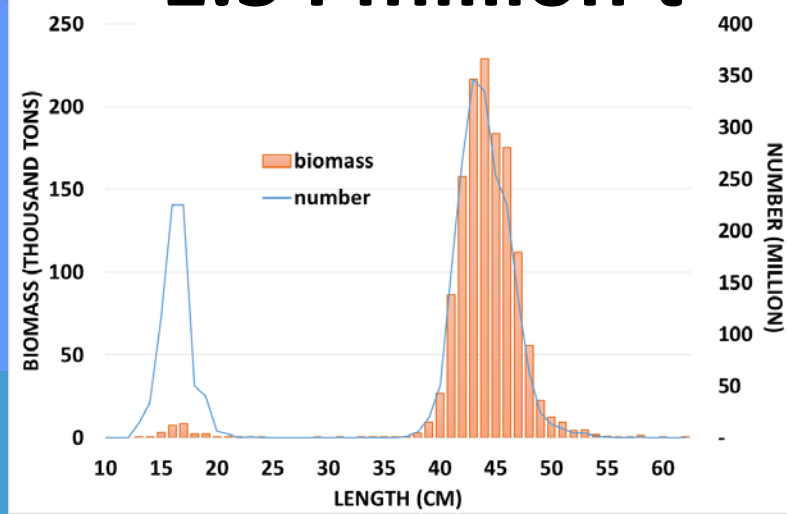
361,043 t



# Biomass of all Age 1+ Pollock



**1.34 million t**



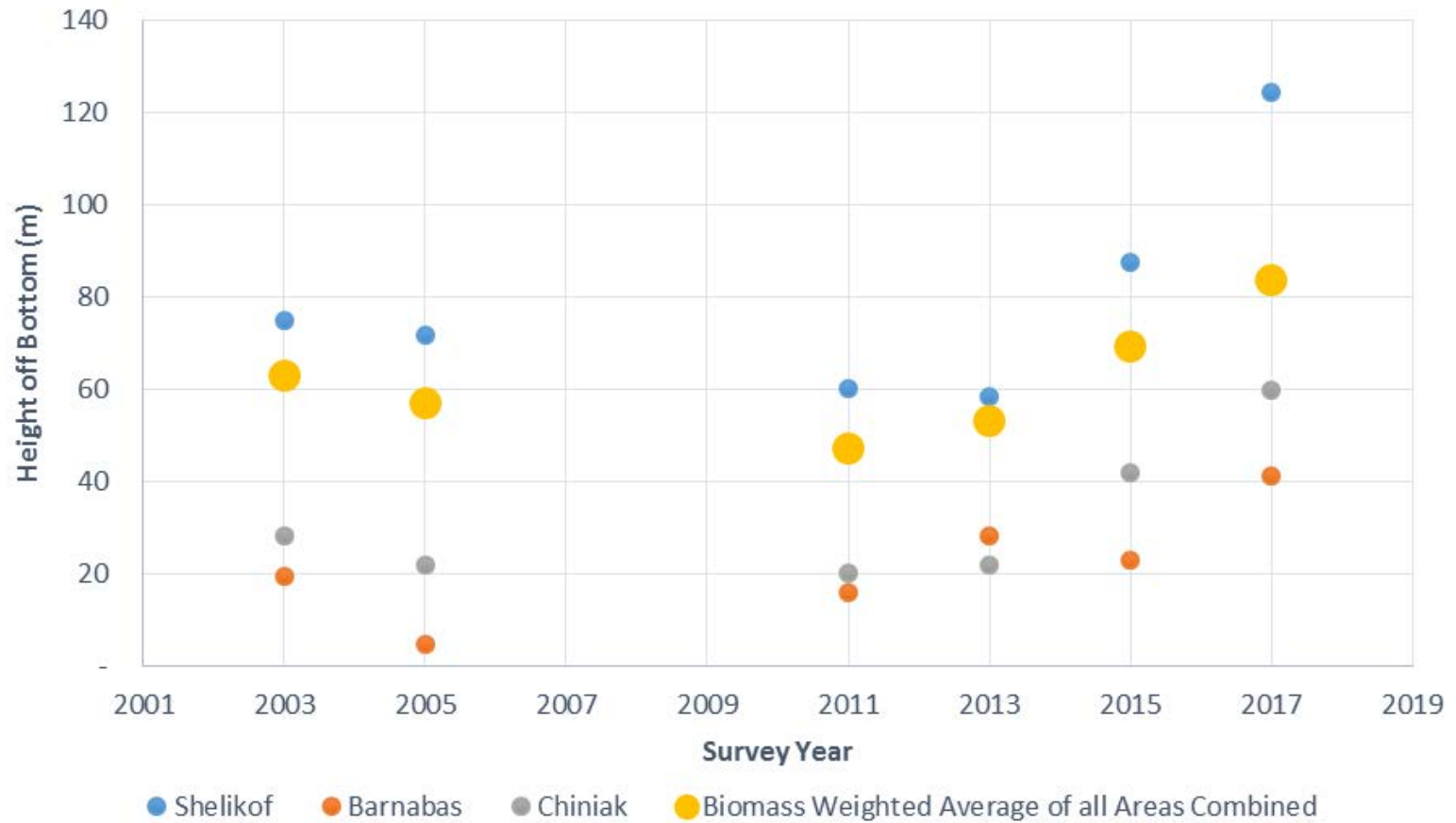


## Pollock Abundance Estimates

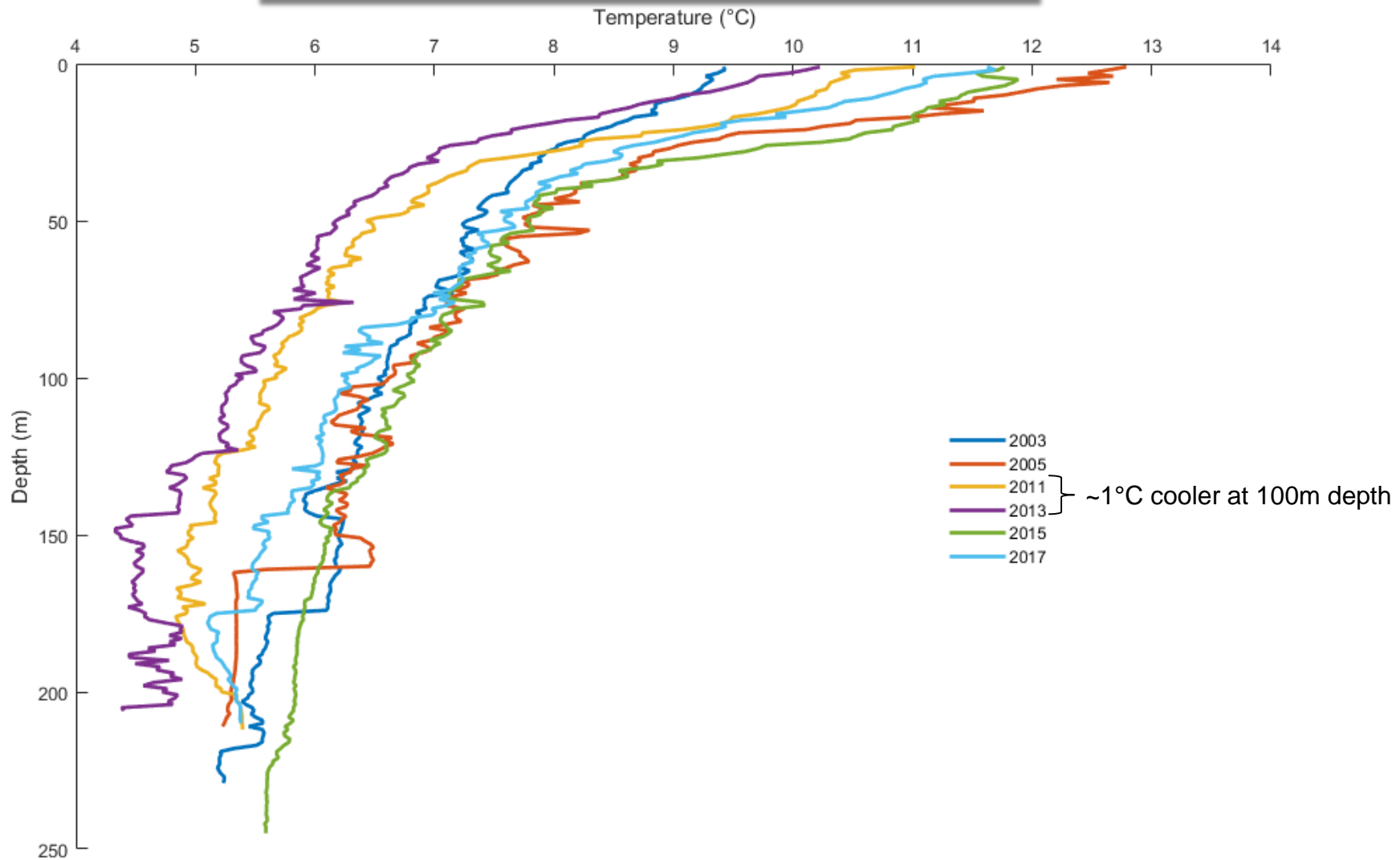
- No correction for mixed layers  
~2 million t
- Age-0 corrected with average  
from CamTrawl counts in mix layer  
age-0:adult ratio 36:1  
~1.8 million t

Best estimate with age-0 pollock removed  
**1.34 million t**

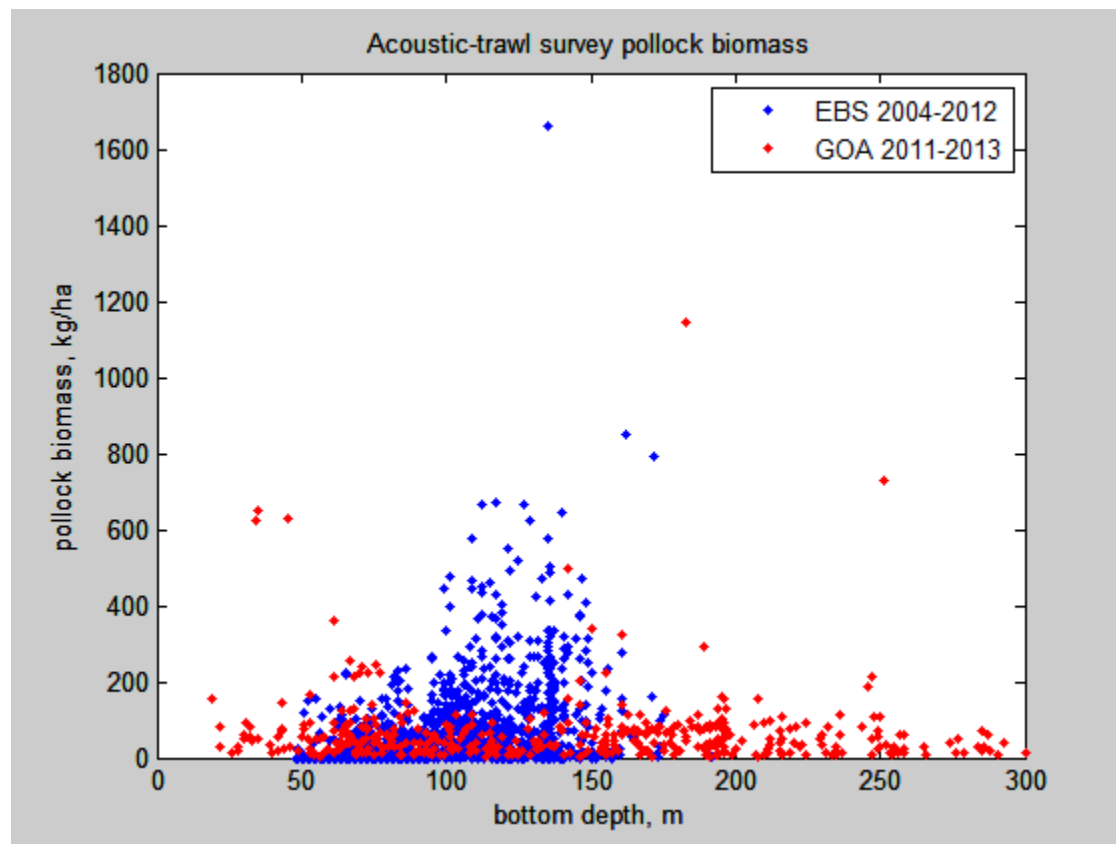
## Weighted Mean Height Off Bottom



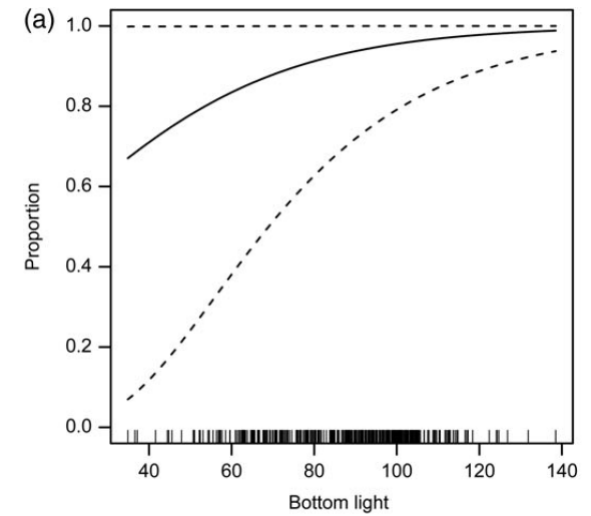
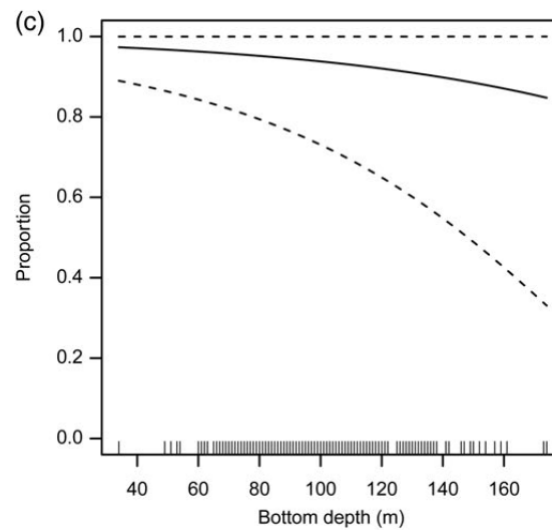
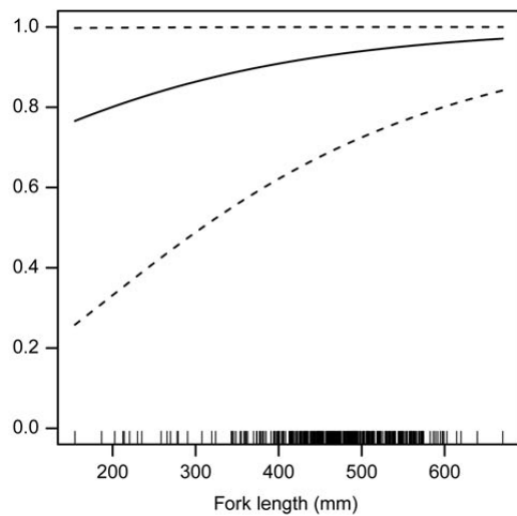
# Average Temperature by Year





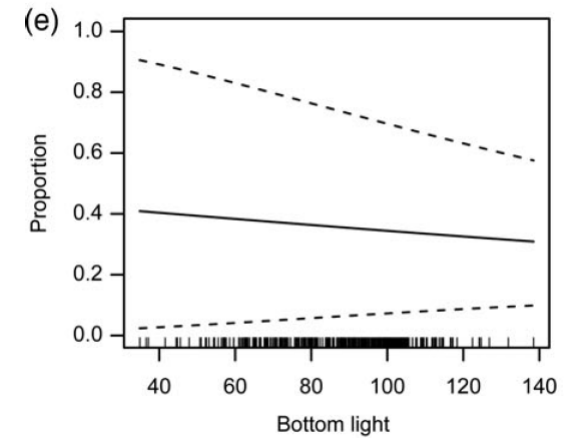
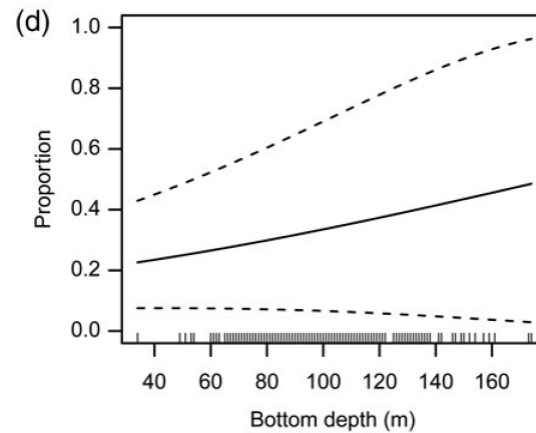
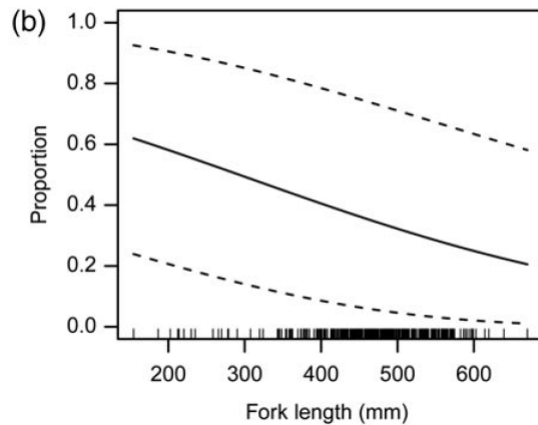


BT



**Figure 5.** Predictor effects on pollock availability to the bottom trawl ( $q_{a,BT}$ ; solid lines) with 95% confidence bounds (dashed lines). Proportion represents predicted  $q_{a,BT}$ .

AT



**Figure 7.** Predictor effects on pollock availability to the acoustics ( $q_{a,A}$ ; solid lines) with 95% confidence bounds (dashed lines). Proportion represents predicted  $q_{a,A}$ .