Results from the 33rd Eastern Bering Sea Shelf Bottom Trawl Survey in 2014

NOAA FISHERIES
Alaska Fisheries Science Center

Resource Assessment &
Conservation Engineering Division
Groundfish Assessment Program

September 24, 2014

2014 EBS Bottom Trawl Survey

- General
- EBS shelf environment
- BT survey results
- miscellaneous

General
Charter vessels

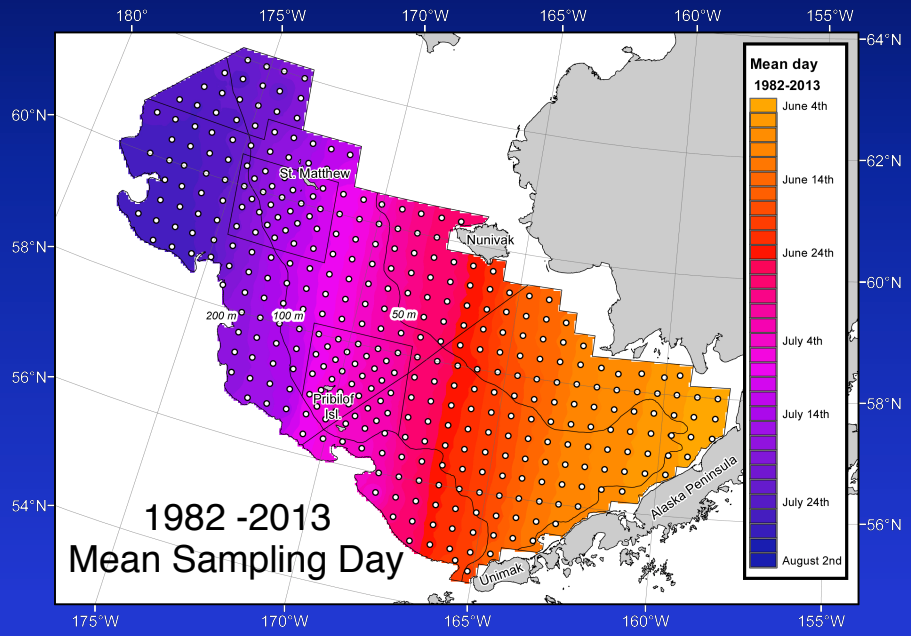
New contracts EBS shelf BT survey charter vessels (2014 to 2018)

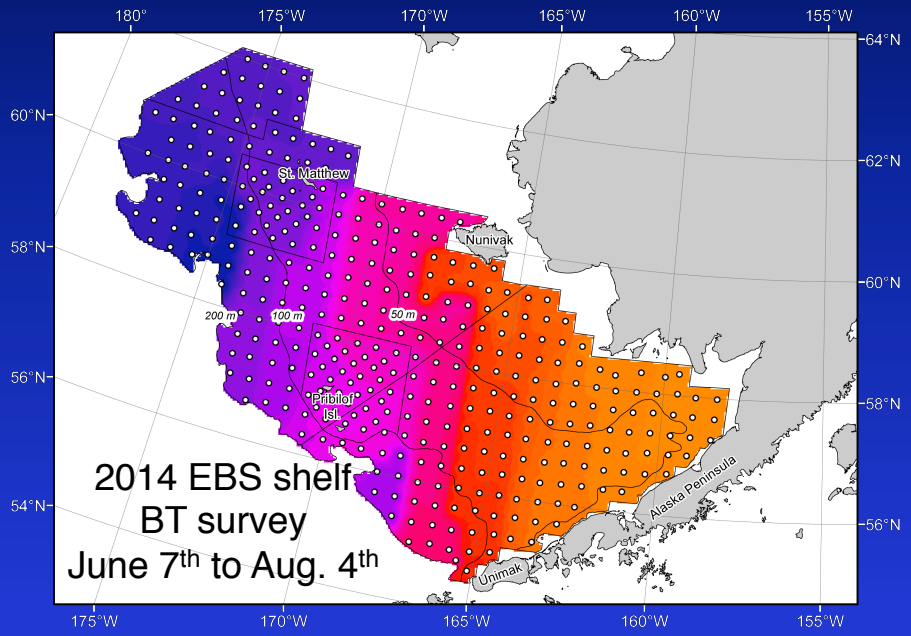
FV *Alaska Knight*
EBS shelf since 2010

FV *Vesteraalen*
WC 3 years
AI 4 years
GOA 5 years
EBS slope 5 years

General

Survey timing



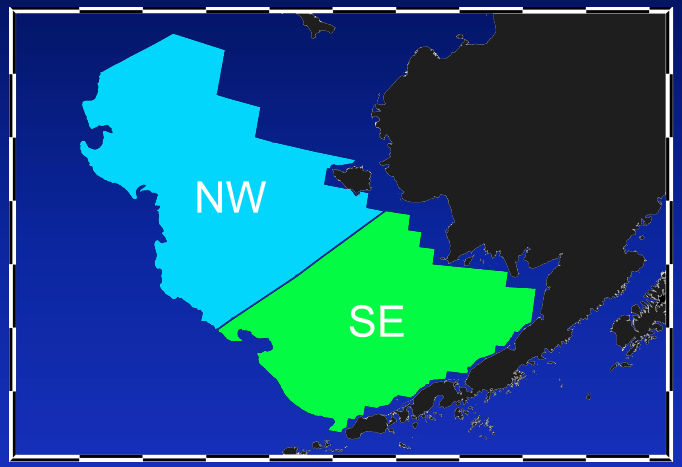


General

Age structure collections (total 8,451)

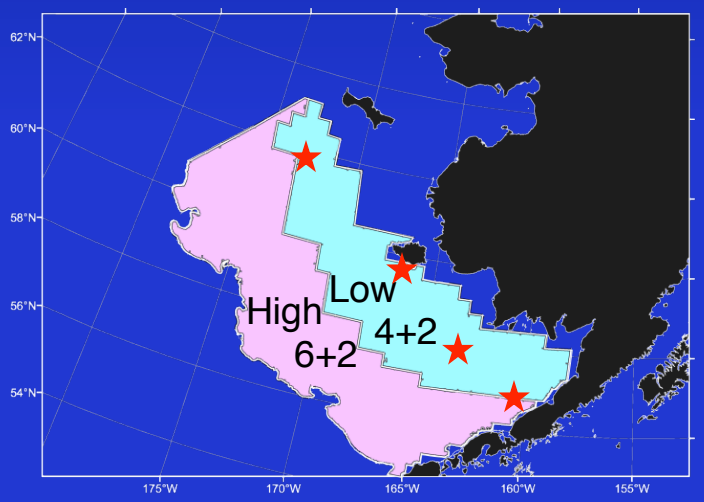
Otolith pairs/sex/cm/area/vessel

Pacific cod	1,241
Yellowfin sole	799
Northern rock sole	283
Flathead sole	703
Pacific halibut	~1,000
Alaska plaice	502
Arrowtooth flounder	392
Kamchatka flounder	314
Greenland turbot	359
Yellow Irish lord	75



Otolith pairs – random

Walleye pollock	2,106 (2,099 aged!)
Pcod (20-50 cm)	4 ★ of 50 each



General

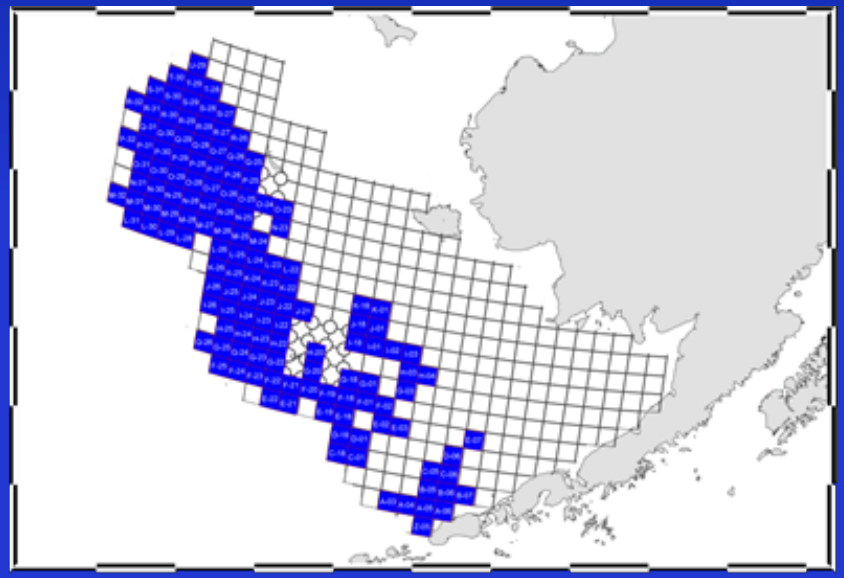
Length measurements (total 144,847)

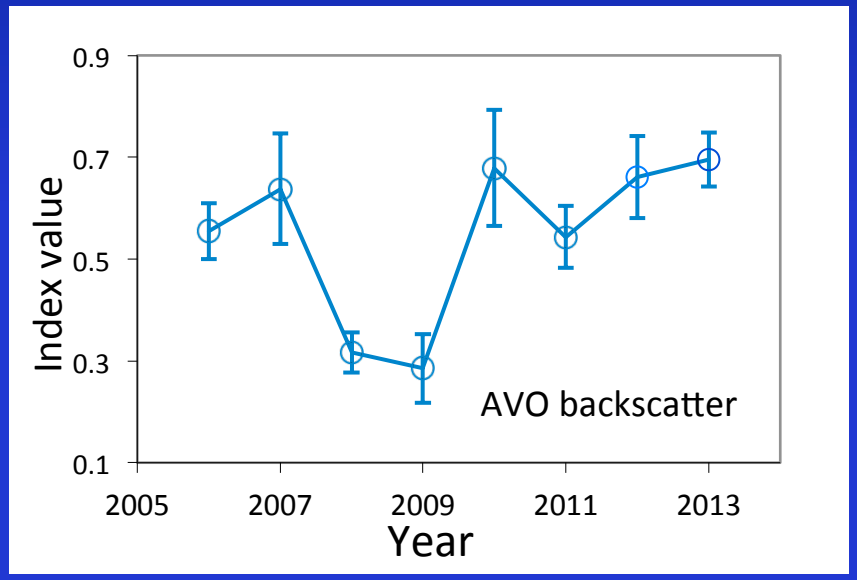
Walleye pollock	43,042
Pacific cod	17,946
Yellowfin sole	20,229
Northern rock sole	17,765
Flathead sole	13,405
Arrowtooth flounder	8,131
Alaska plaice	7,296
Kamchatka flounder	2,490
Bering flounder	2,403
Pacific halibut	2,018
Greenland turbot	976
Alaska skate	3,576
Plain sculpin	1,933
Great sculpin	453
Bigmouth sculpin	207
Yellow Irish lord	196
Warty sculpin	161
Other fishes	2,620

General

Acoustic data collection

- Acoustic data collection with Simrad ES60
- Collaboration with MACE
- Data collected since 2006 - 9th consecutive year
- Acoustic Vessels of Opportunity (AVO) index
- Used in pollock assessment since 2010
- Additional midwater tows for length information

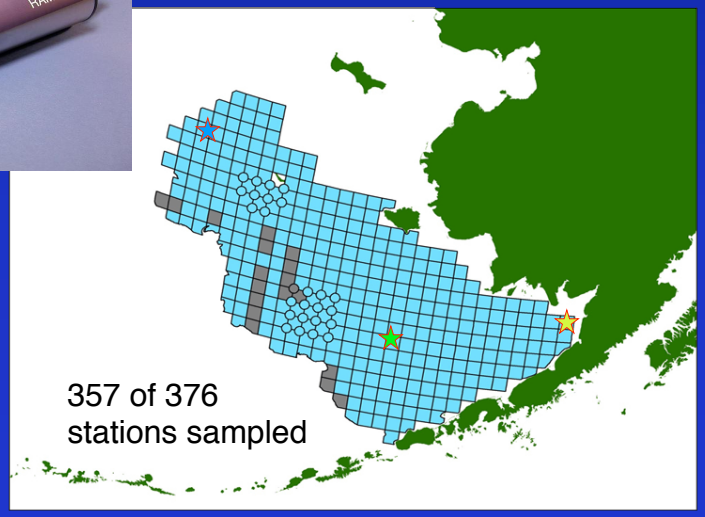


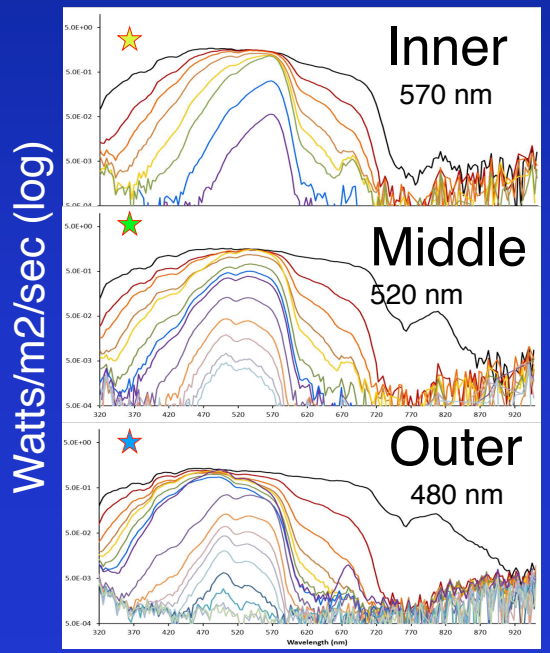


General

Environmental data collections

- Headrope-mounted CTDs since 2008 (7 yrs)
- MK9 light intensity since 2005 (10 yrs)
- Spectral Irradiance Logger NEW





General

Fish stomachs (total 5,817)

- Number by species
  - 2,950 walleye pollock
  - 1,707 Pacific cod
  - 463 Pacific halibut
  - 697 ATF/Kamchatka flounder

General

Other Special Collections

- Prey availability in juvenile flatfish nursery habitat
- Observer training collection
- Fall Fishermen's Festival collection
- Walrus diets in Bristol Bay collections
- Osteology of fishes
- Bering flounder systematics
- Pacific cod size-at-age
- Skate egg case collections
- Evolution of fish vision

General

Commercial Crab Special Projects
Shellfish Assessment Program, Kodiak

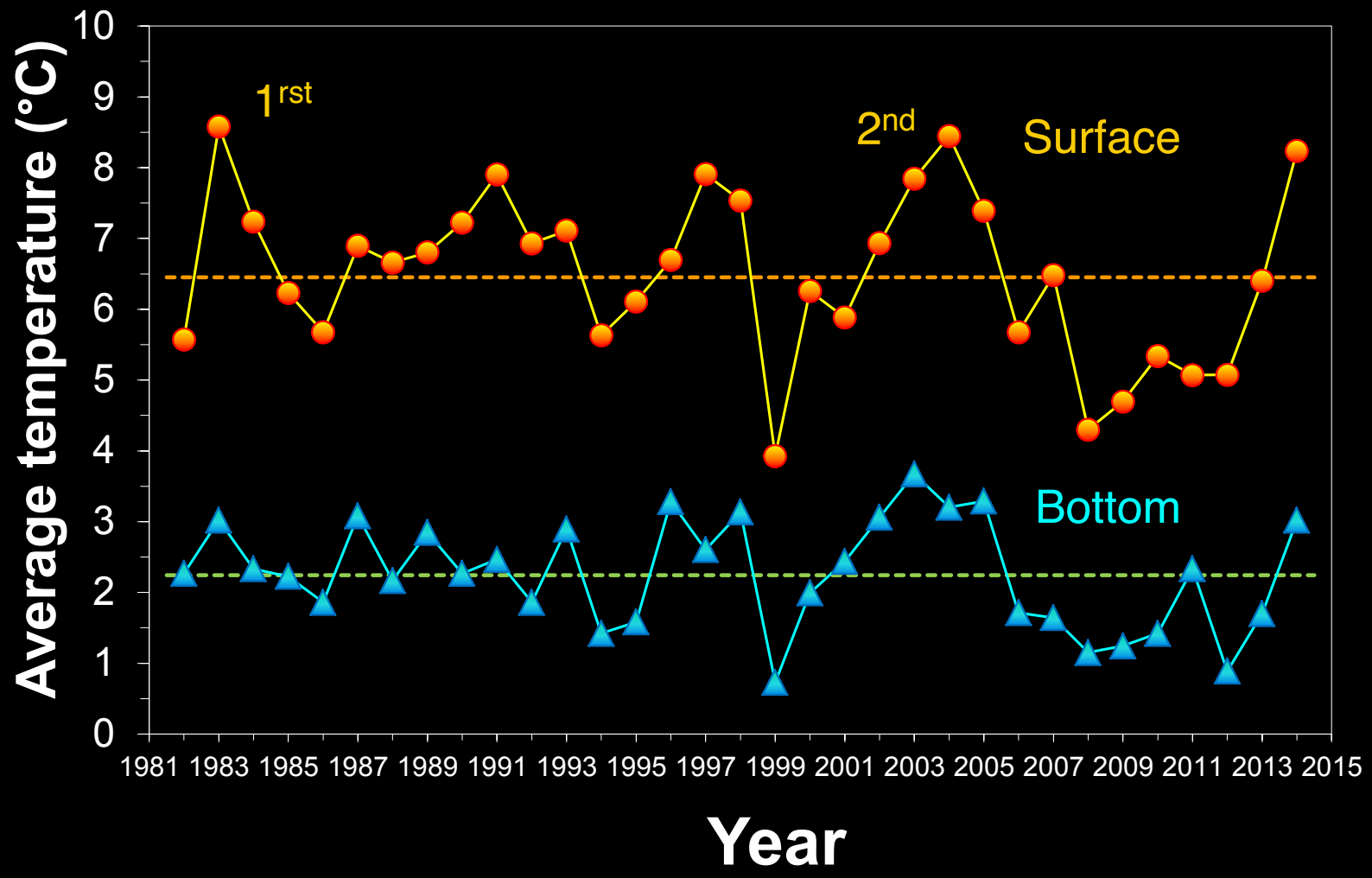
- Selectivity of BSFRF/NMFS survey trawls
- Bitter crab syndrome
- Age determination of snow crab
- RKC predation by Pacific cod
- Reprod. potential of female *Chionocetes* crab
- Annual/biennial reproduction of snow crab
- Effects of ocean acidification
- Male snow crab maturity
- Satellite tags on female RKC to locate spawning sites

2014 EBS Bottom Trawl Survey

- General
- EBS shelf environment
- BT survey results
- miscellaneous

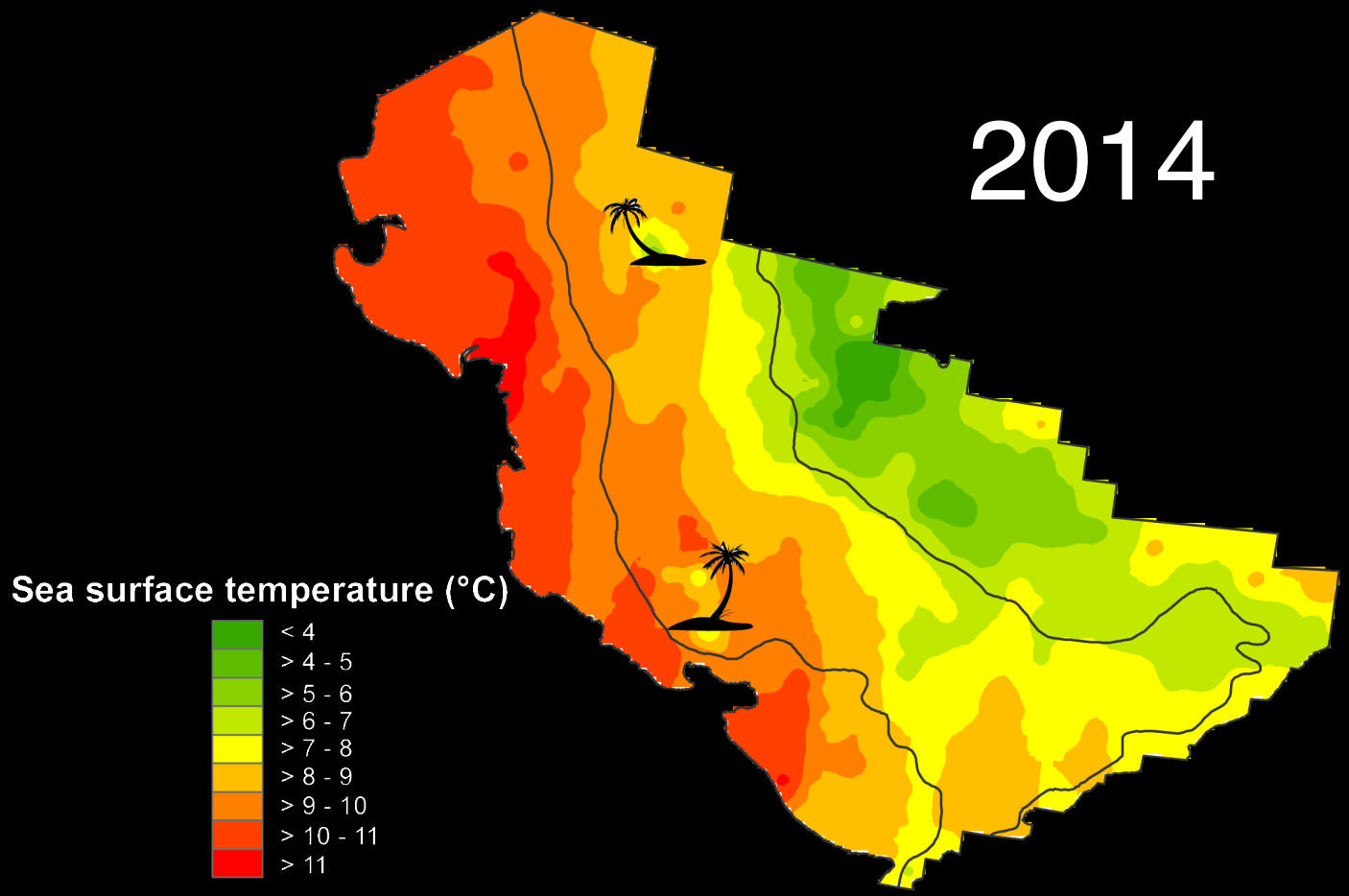
EBS shelf environment

Average SST and bottom temperatures



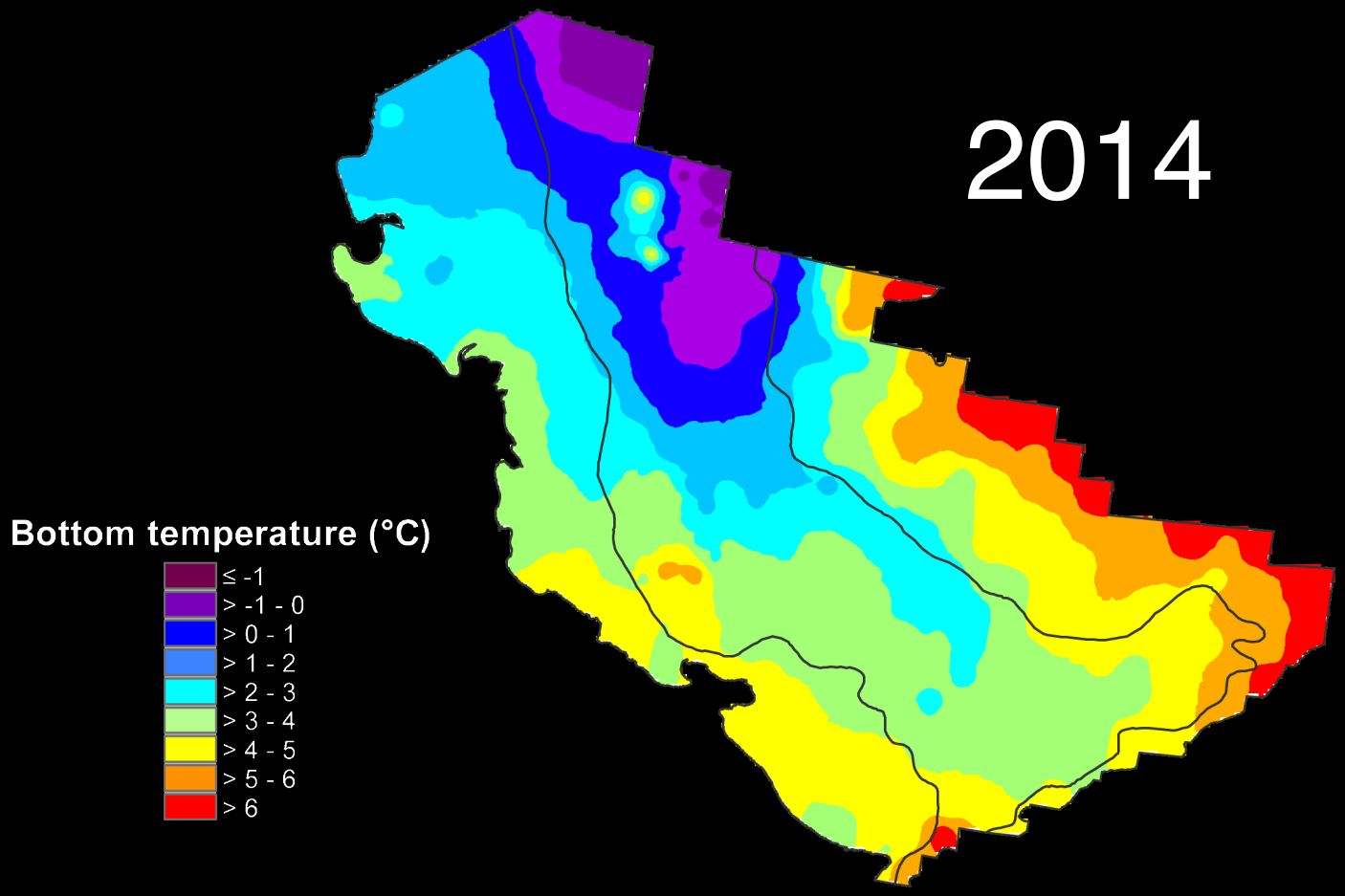
EBS shelf environment

Distribution of sea surface temperatures



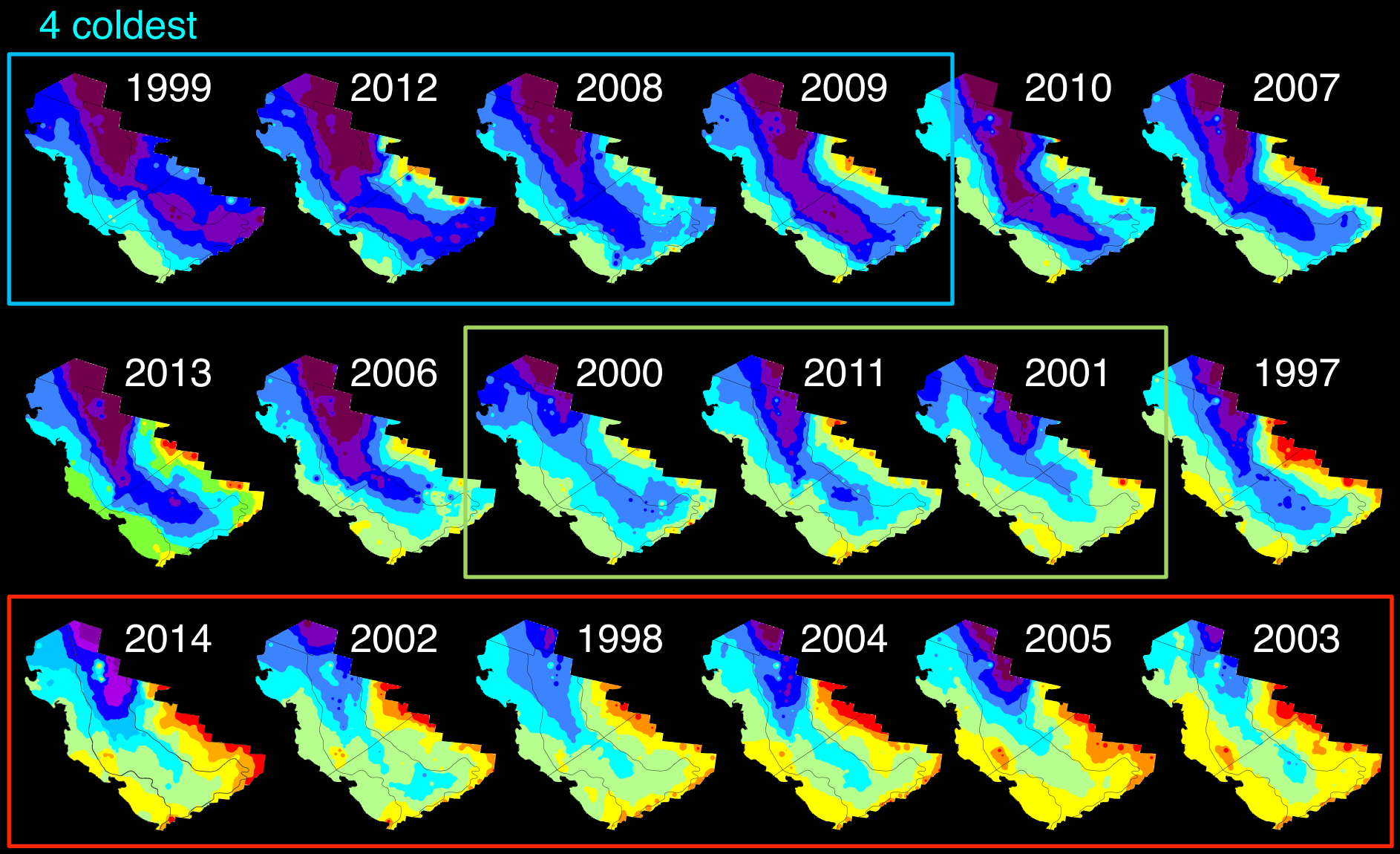
EBS shelf environment

Distribution of bottom temperature



EBS shelf environment

BT survey bottom temperature

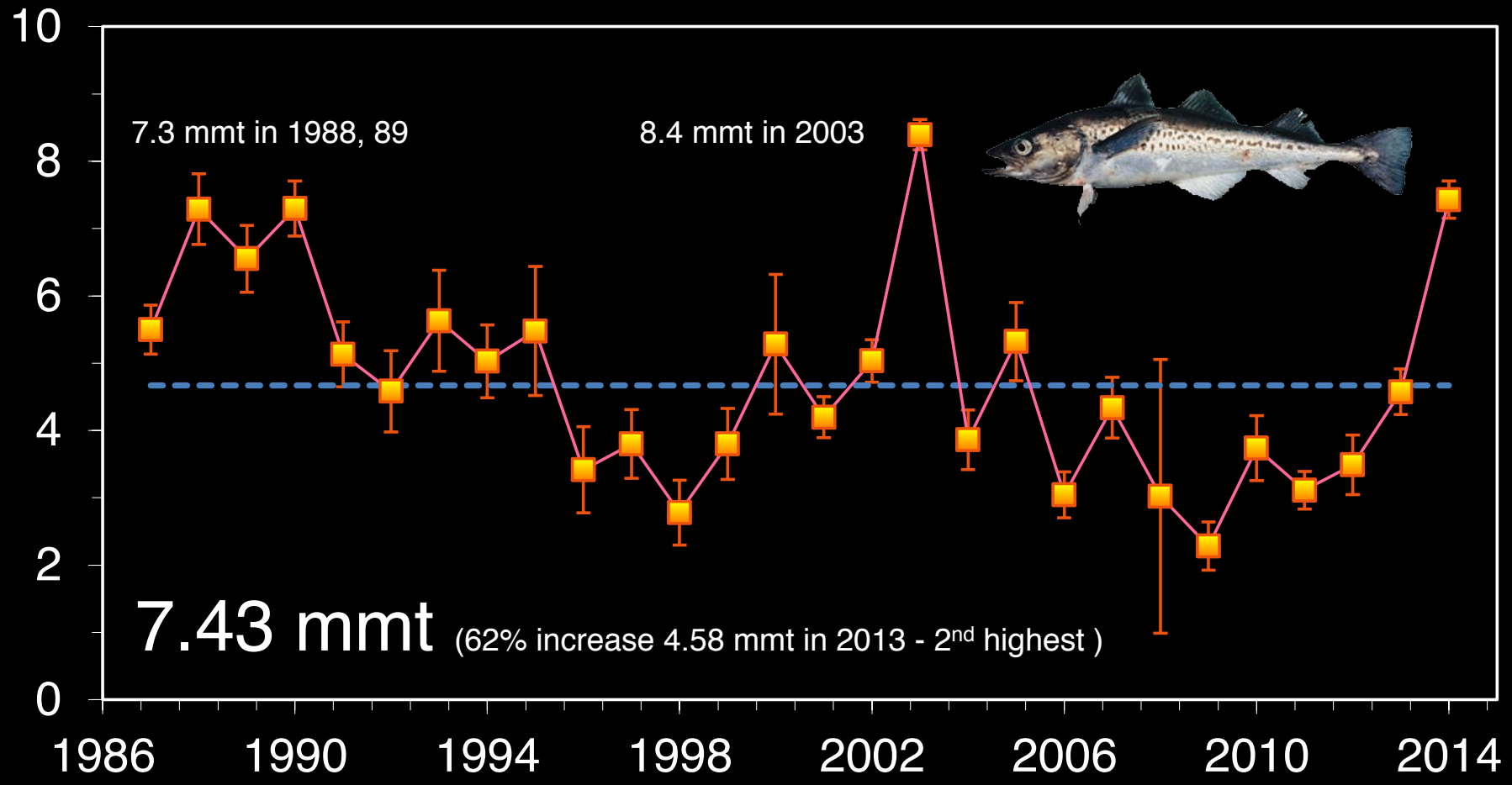


2014 EBS Bottom Trawl Survey

- General
- EBS environment
- BT survey results
- miscellaneous

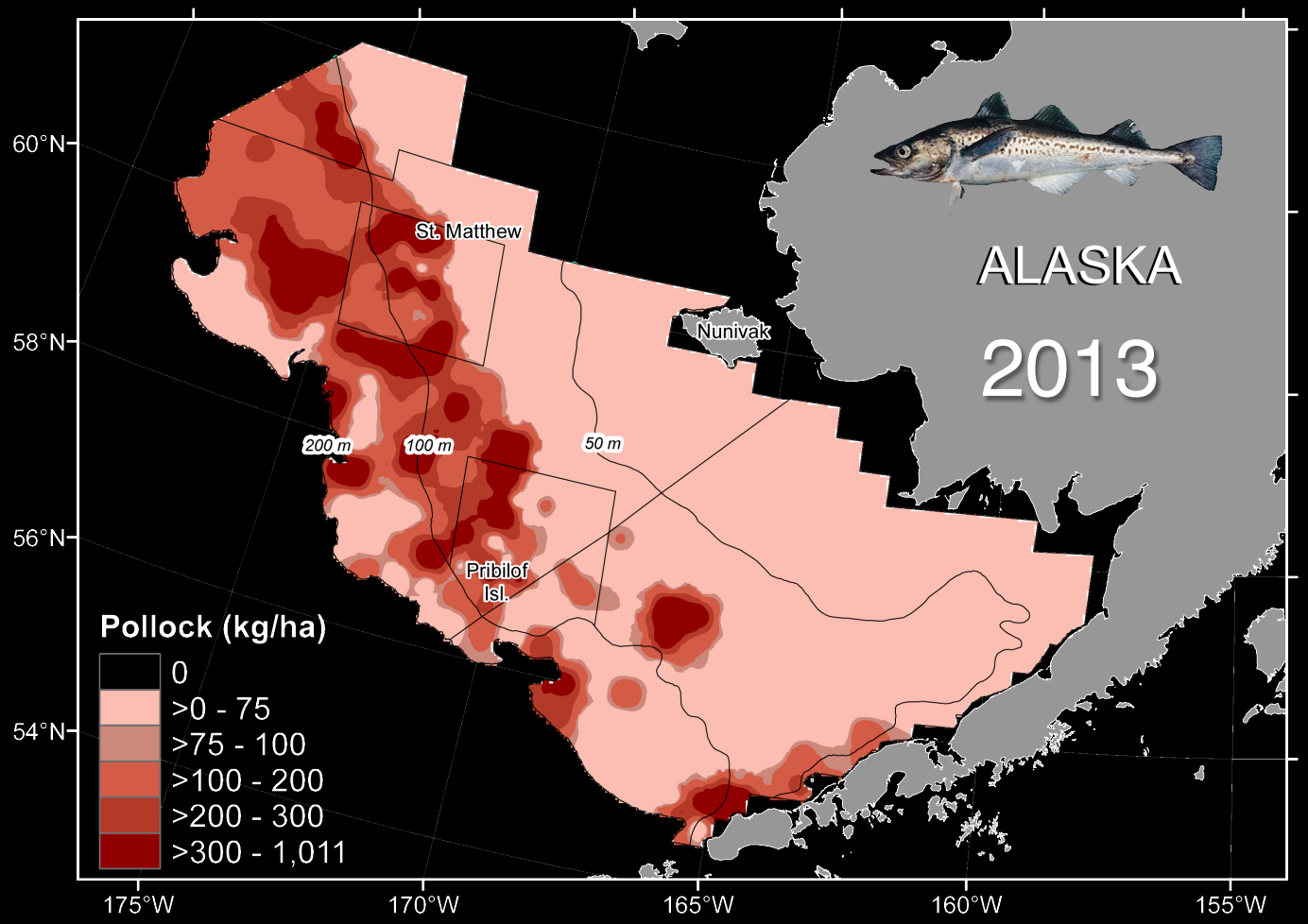
BT survey results

Walleye pollock



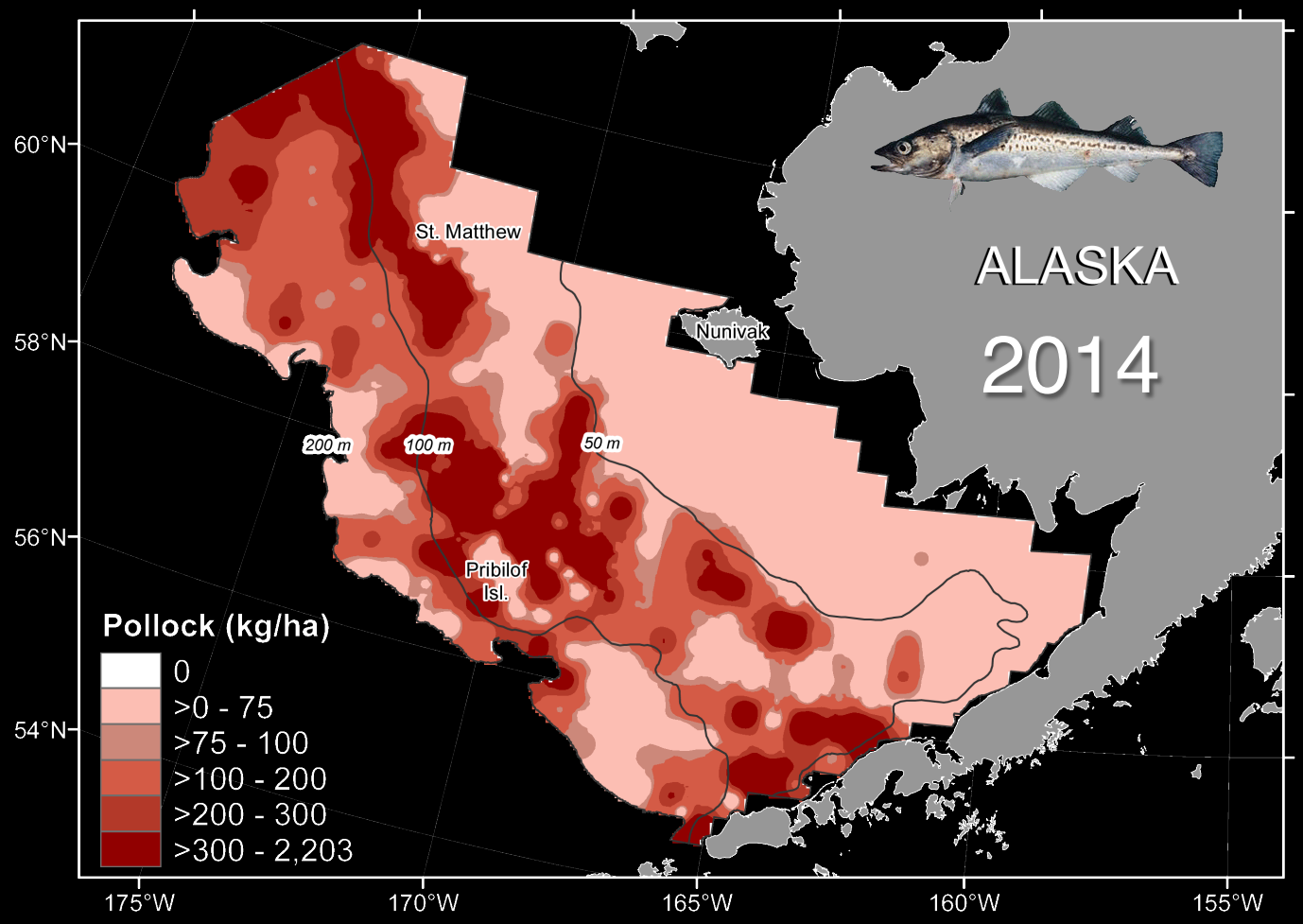
Distribution and Abundance

Walleye pollock



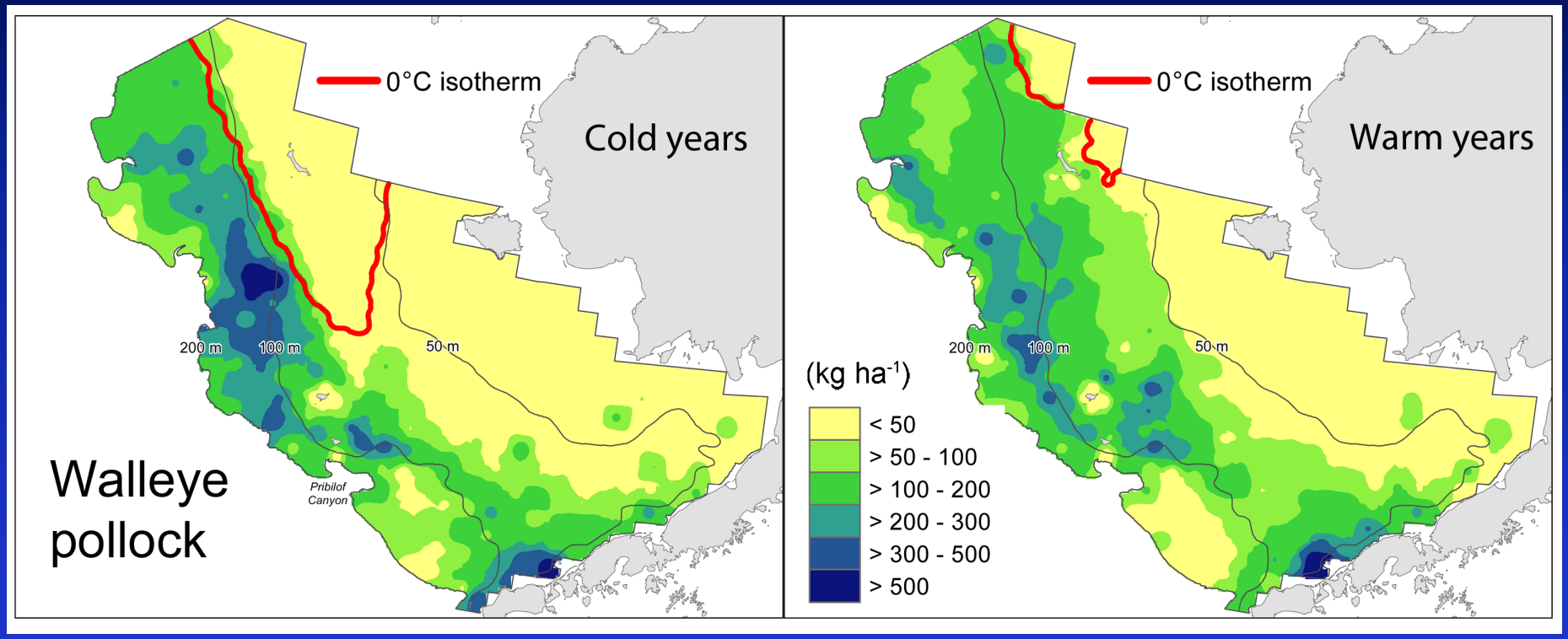
Distribution and Abundance

Walleye pollock



Distribution and Abundance

Average 1982-2013



16 coldest years

16 warmest years

(Kotwicki & Lauth 2013)

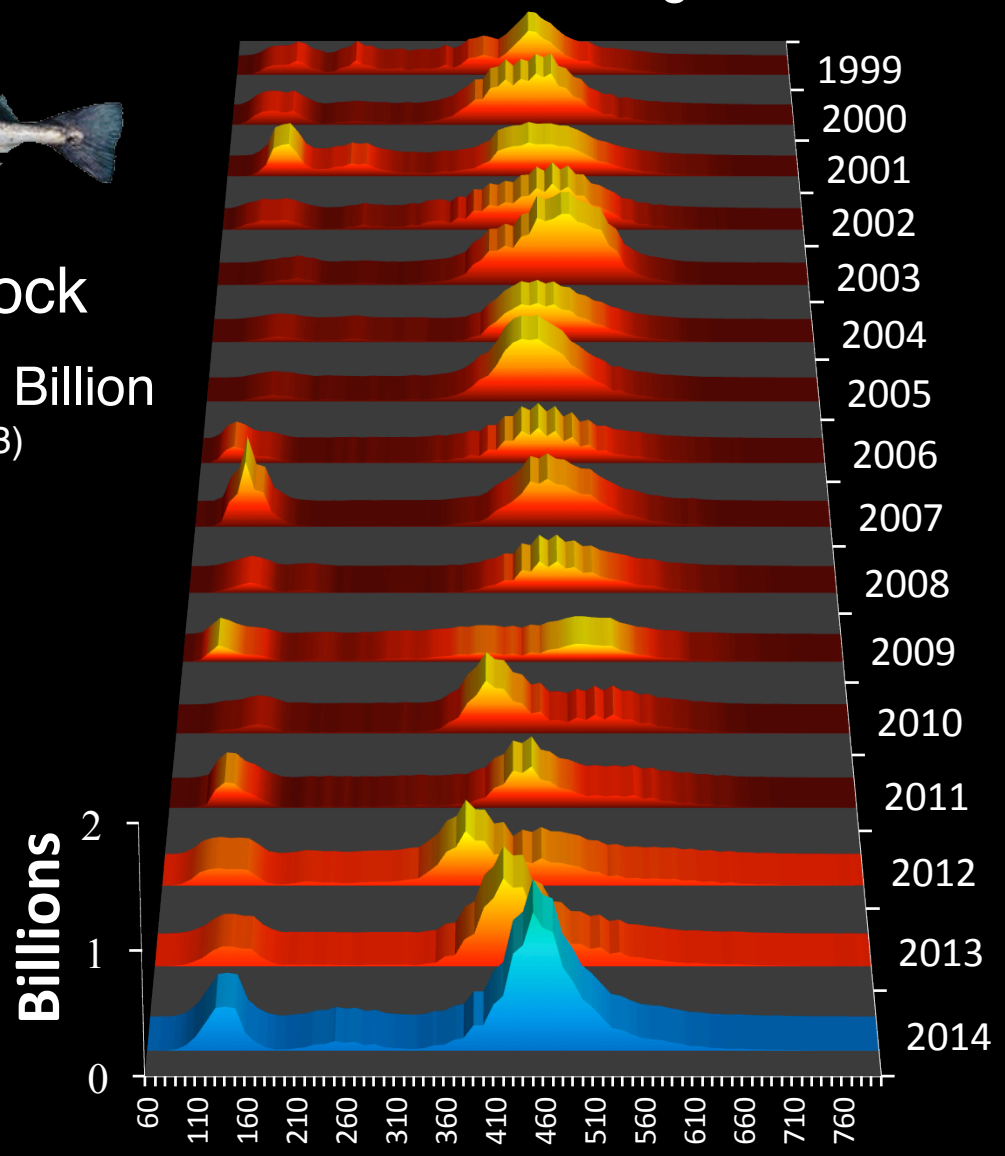
BT survey results

Abundance-at-length

Walleye pollock

Tot. abund. = 11.8 Billion

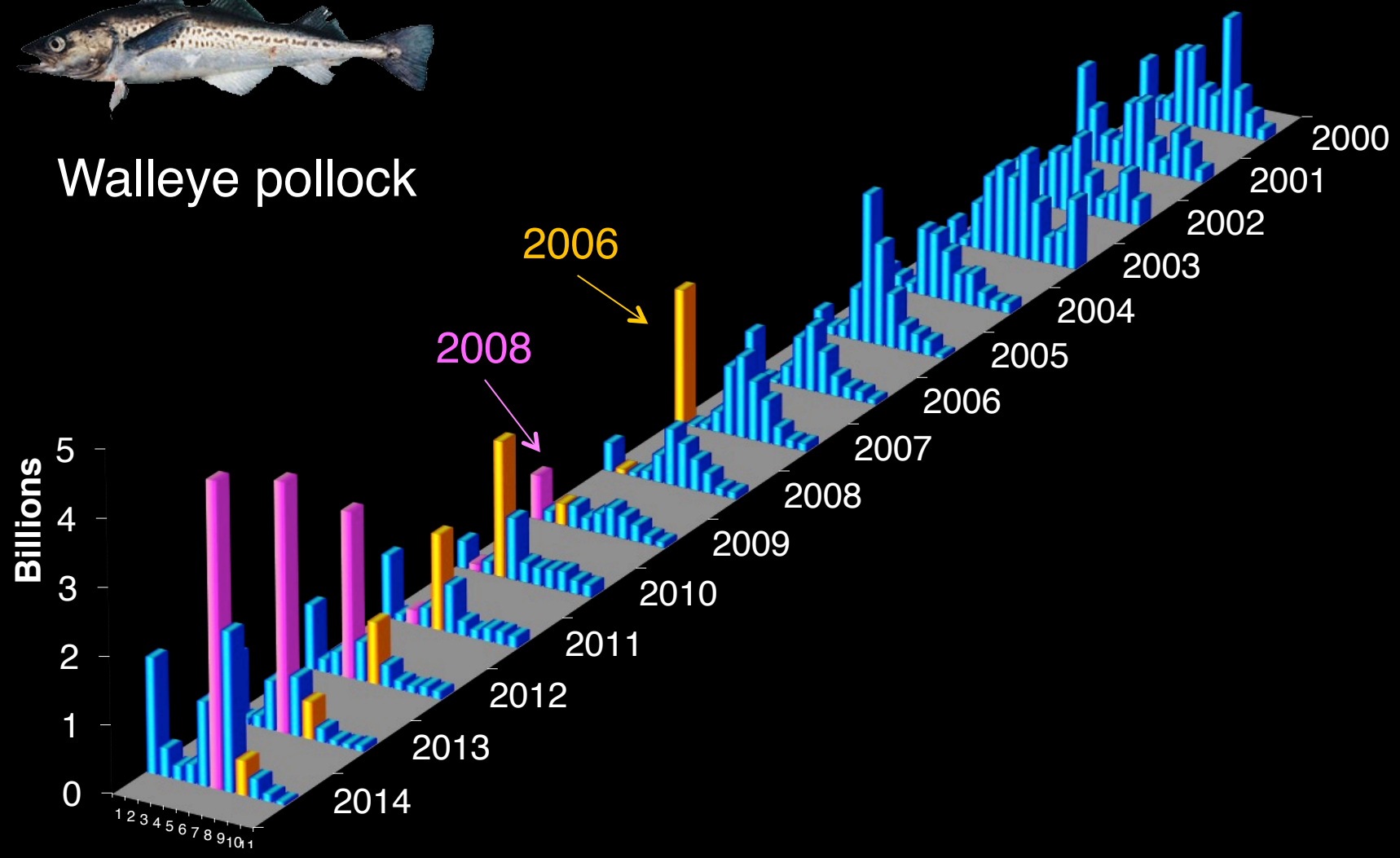
(7.7 Billion in 2013)



BT survey results

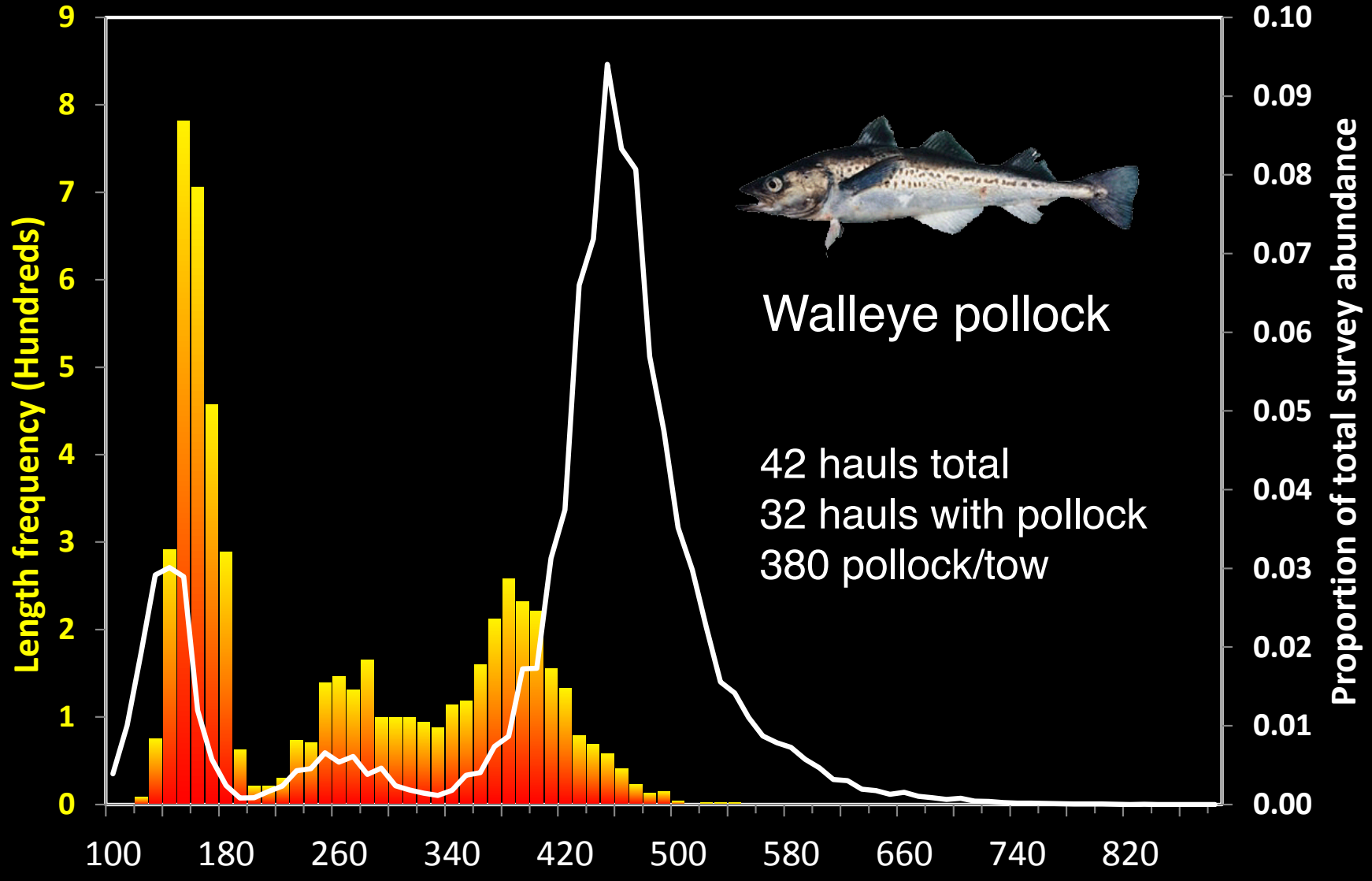
Abundance-at-age

Walleye pollock



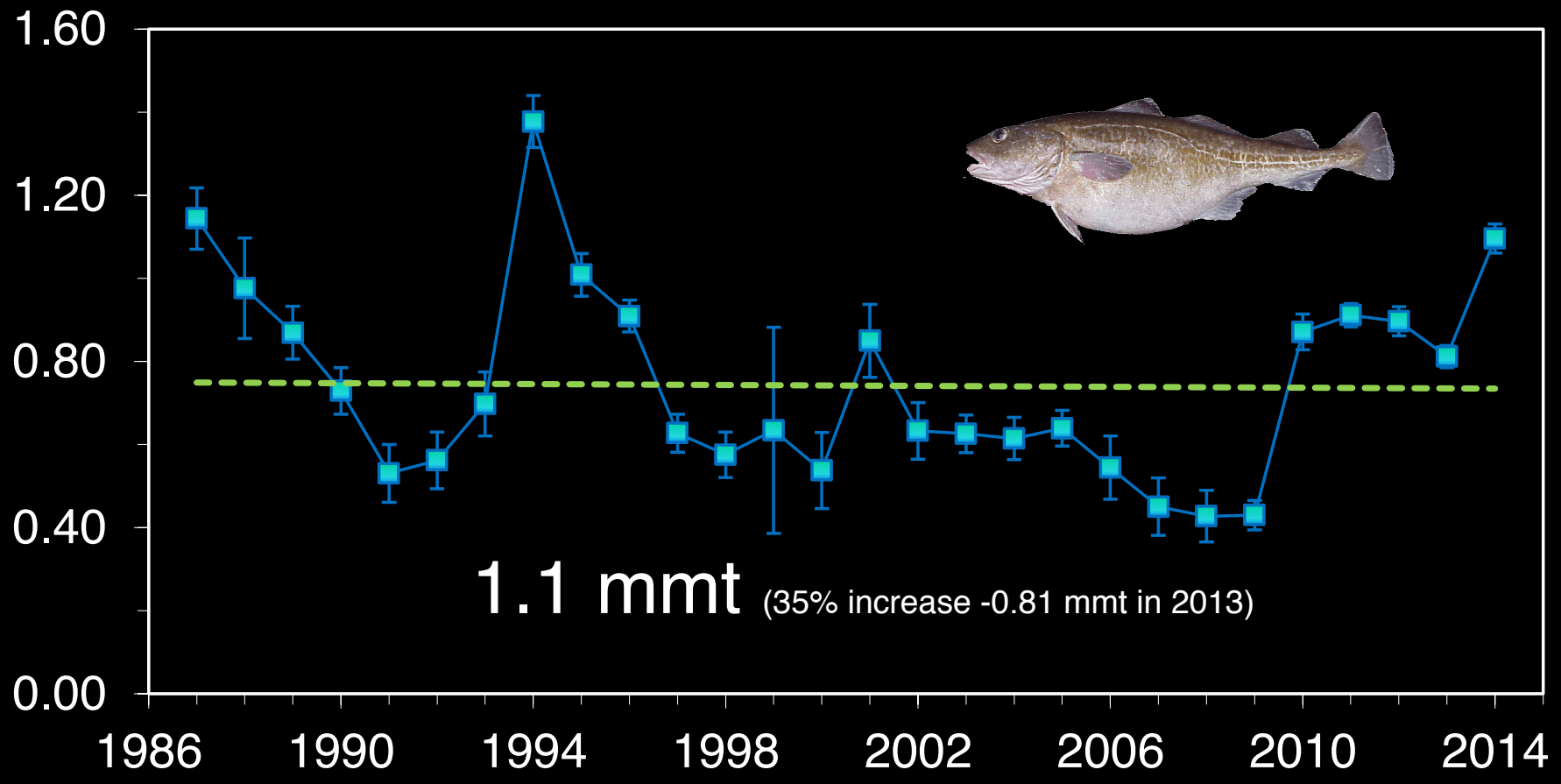
BT survey results

Learning to use BT for midwater tows to obtain length data



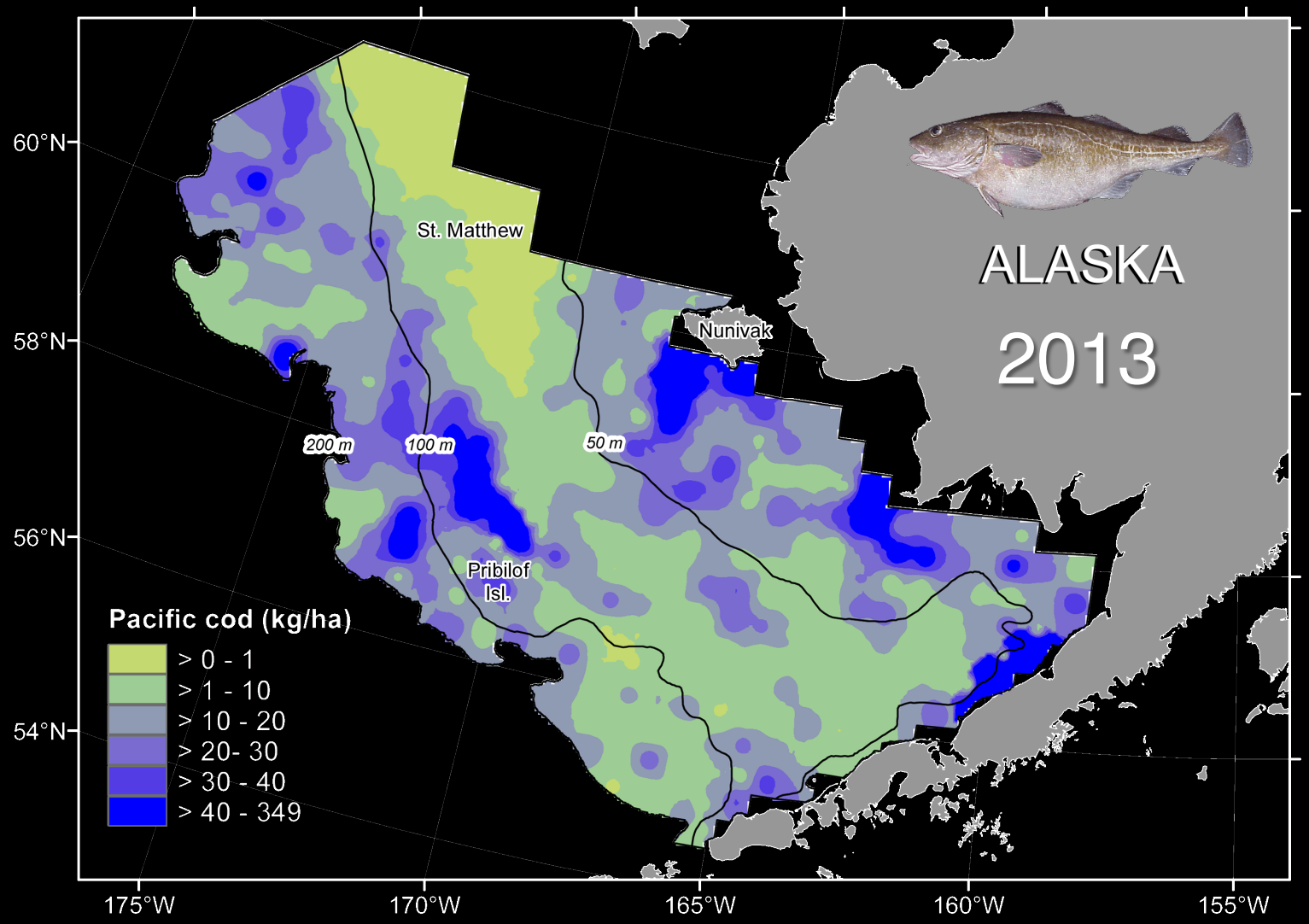
BT survey results

Pacific cod



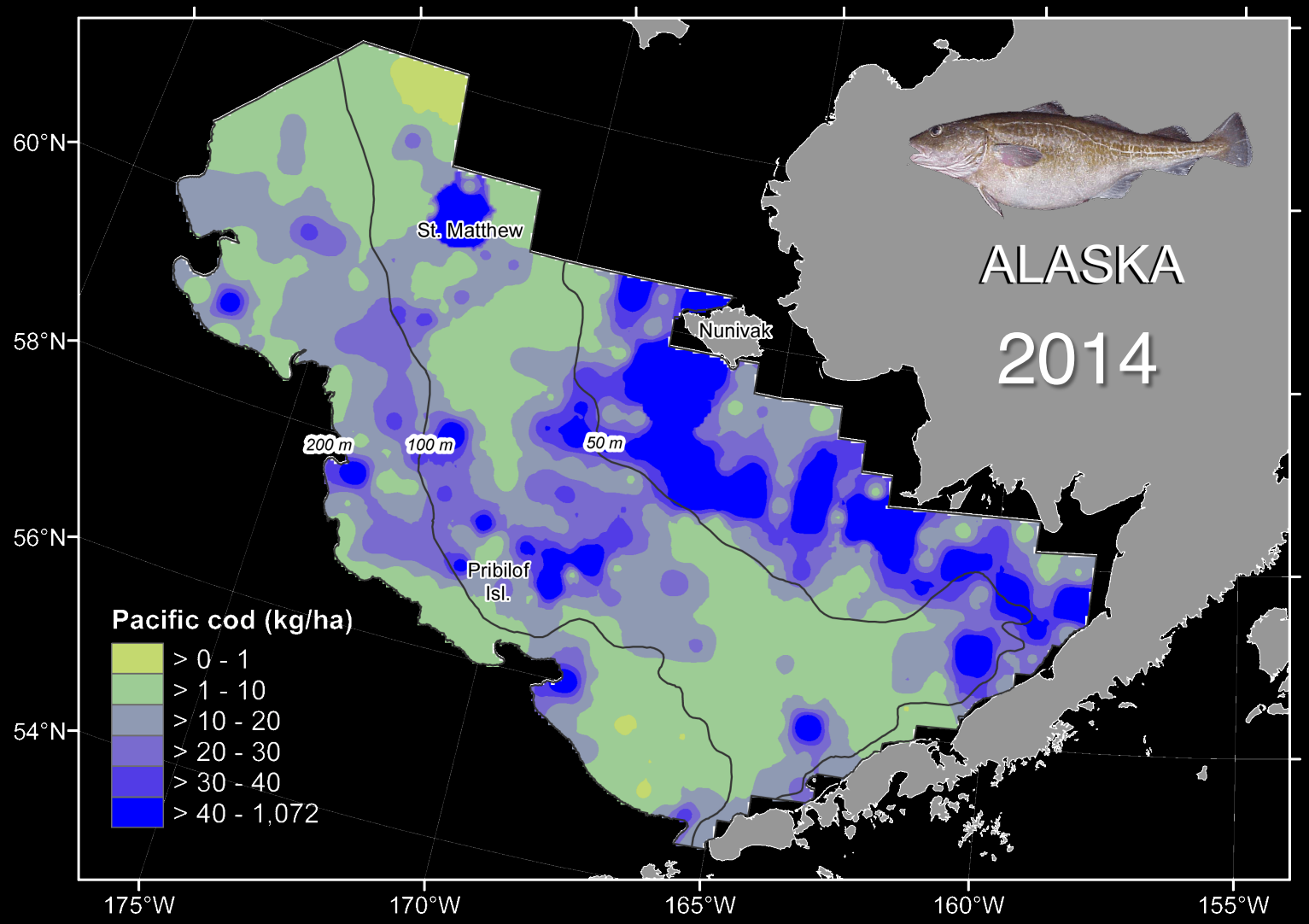
Distribution and Abundance

Pacific cod



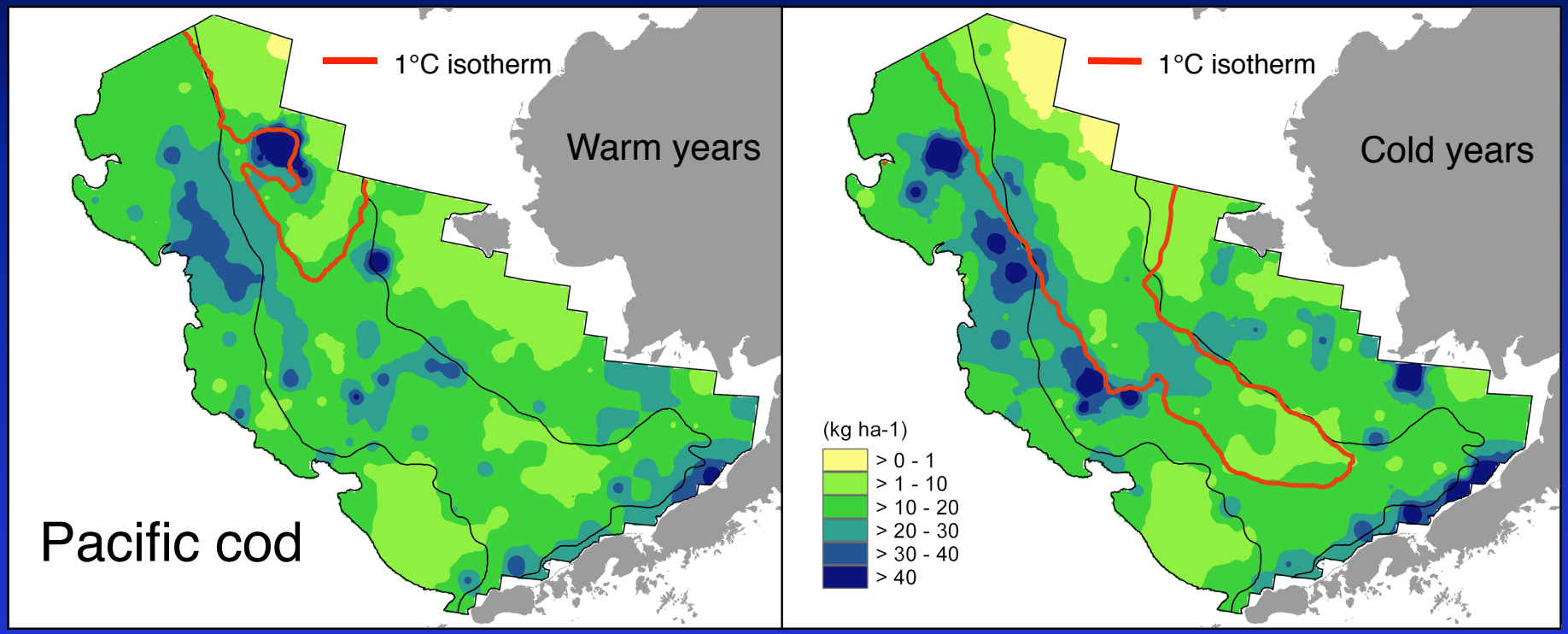
Distribution and Abundance

Pacific cod



Distribution and Abundance

Average 1982 to 2013



16 coldest years

16 warmest years

(Kotwicki & Lauth 2013)

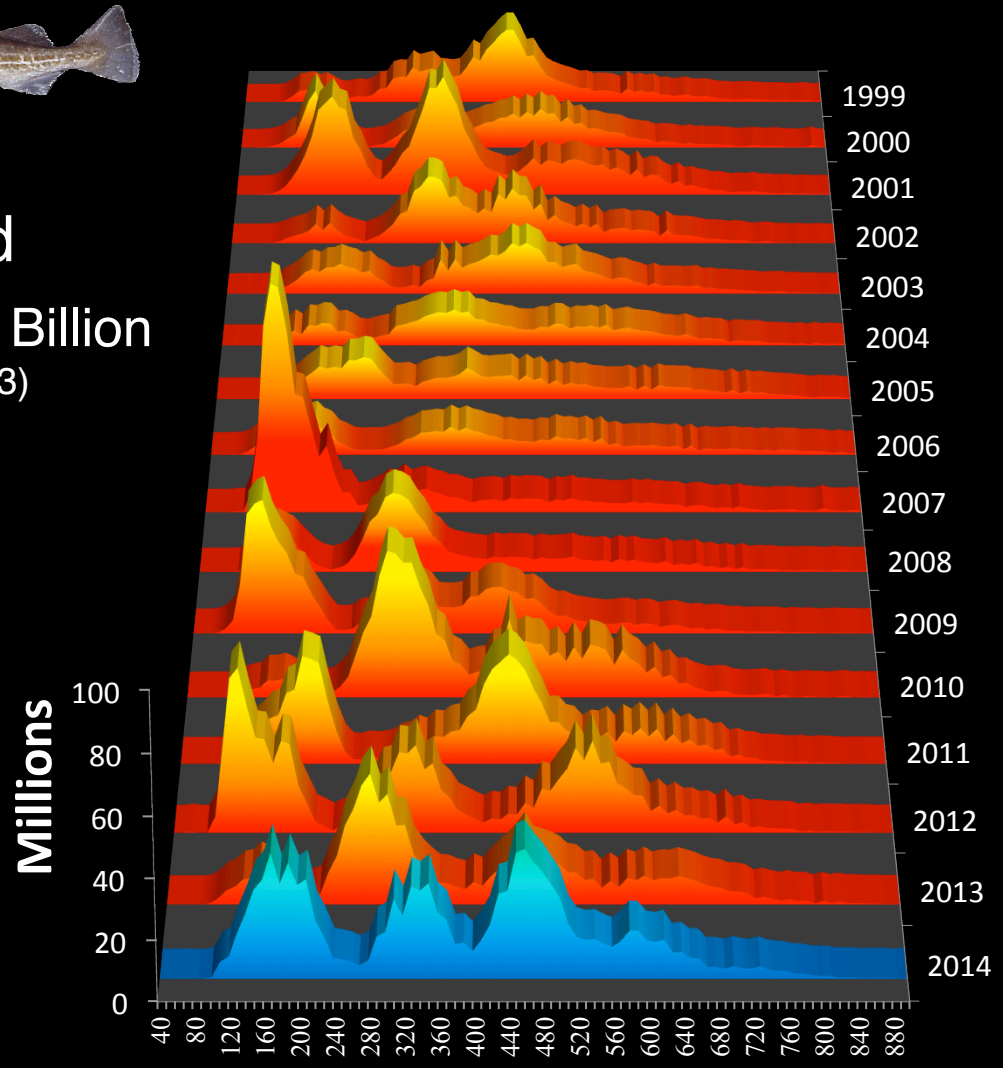
BT survey results

Total abundance-at-length

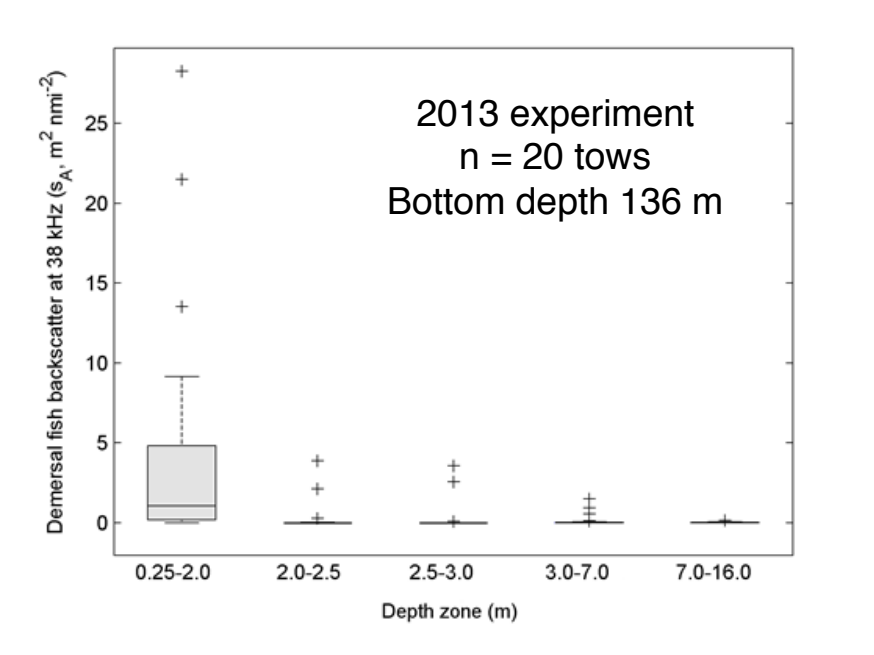
Pacific cod

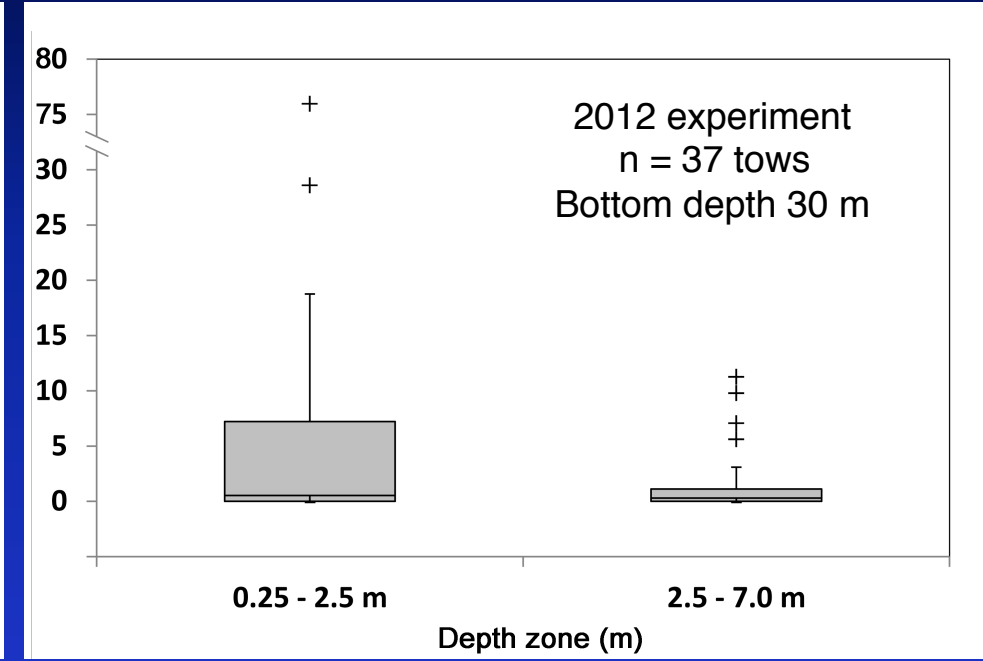
Tot. abund. = 1.13 Billion

(0.76 Billion in 2013)



Pacific cod vertical availability
Fish backscatter



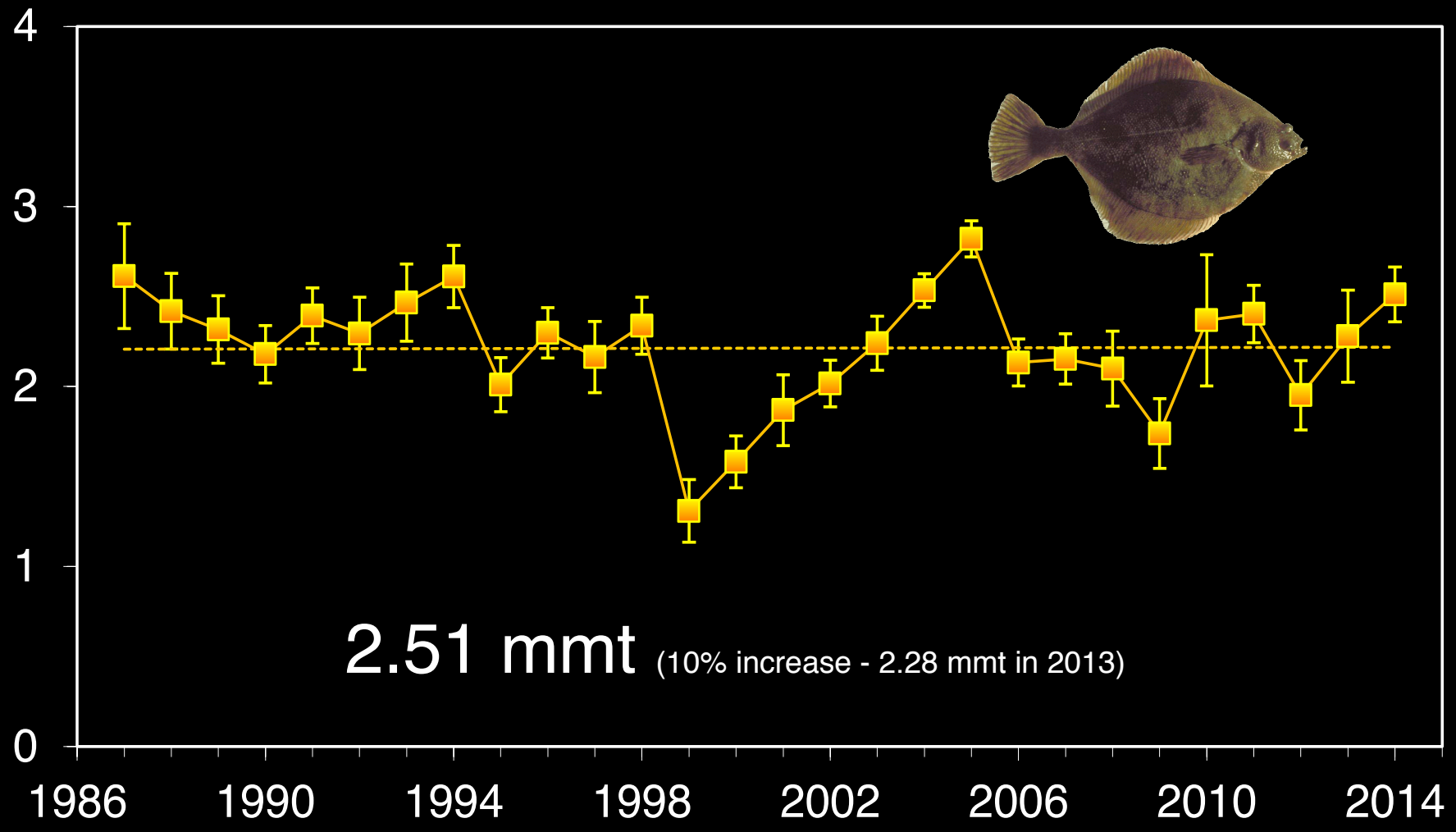


Analyzing ~50 additional tows from 2006-2014

- bottom depth range 23 -136 m
- greater than 250 kg of Pacific cod in catch sample
- minimal contamination from other fish with air bladders

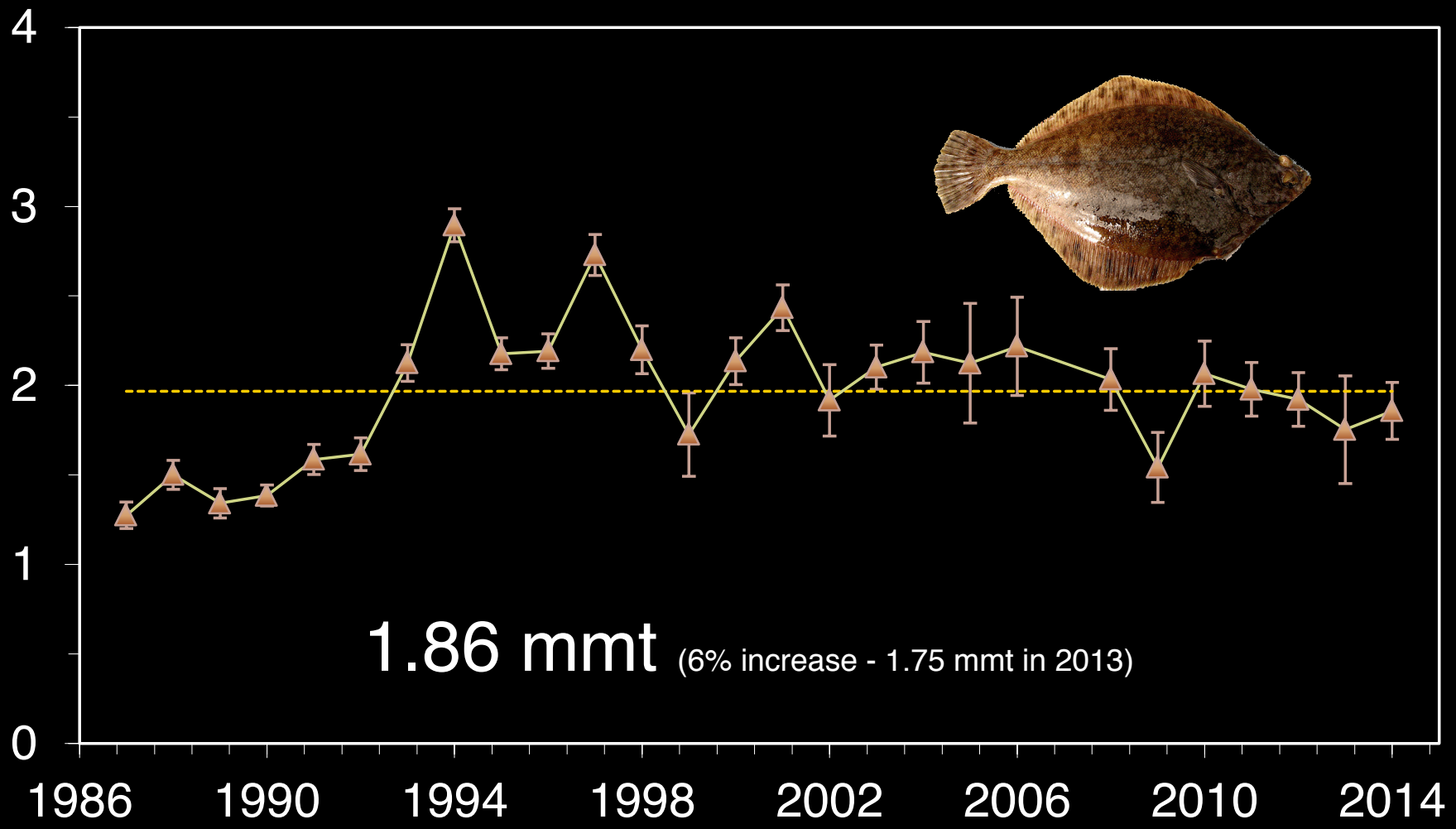
BT survey results

Yellowfin sole



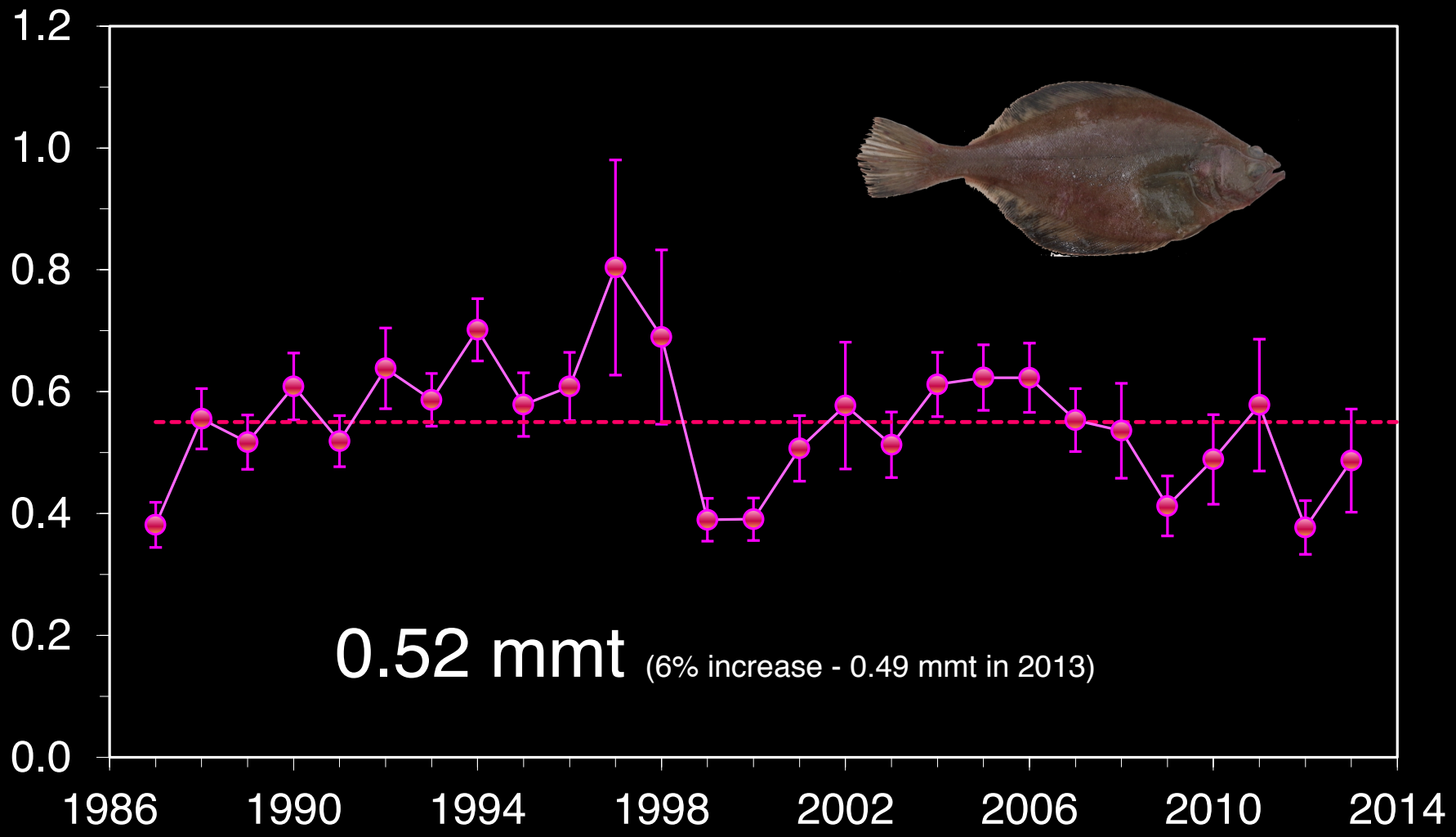
BT survey results

Northern rock sole



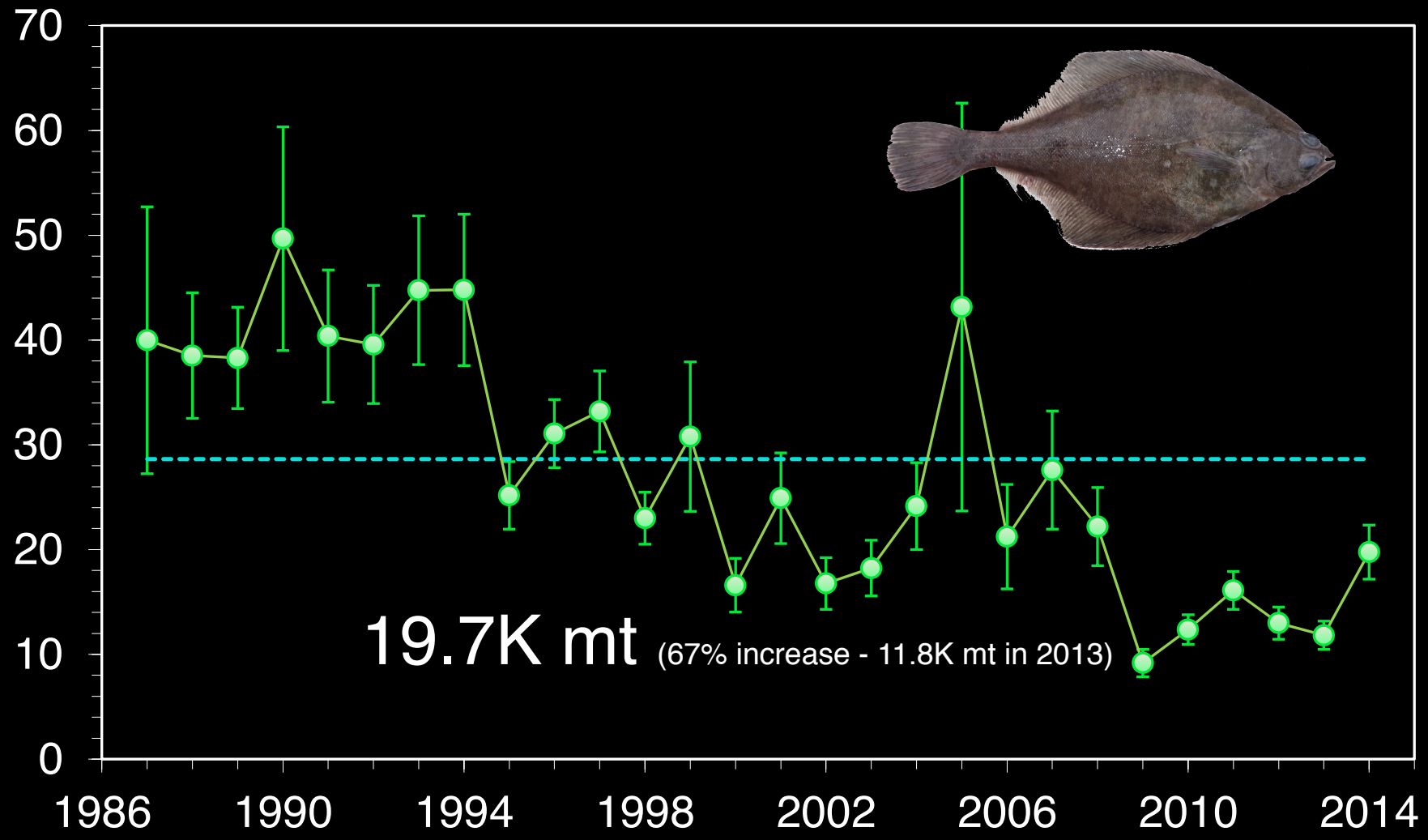
BT survey results

Flathead sole



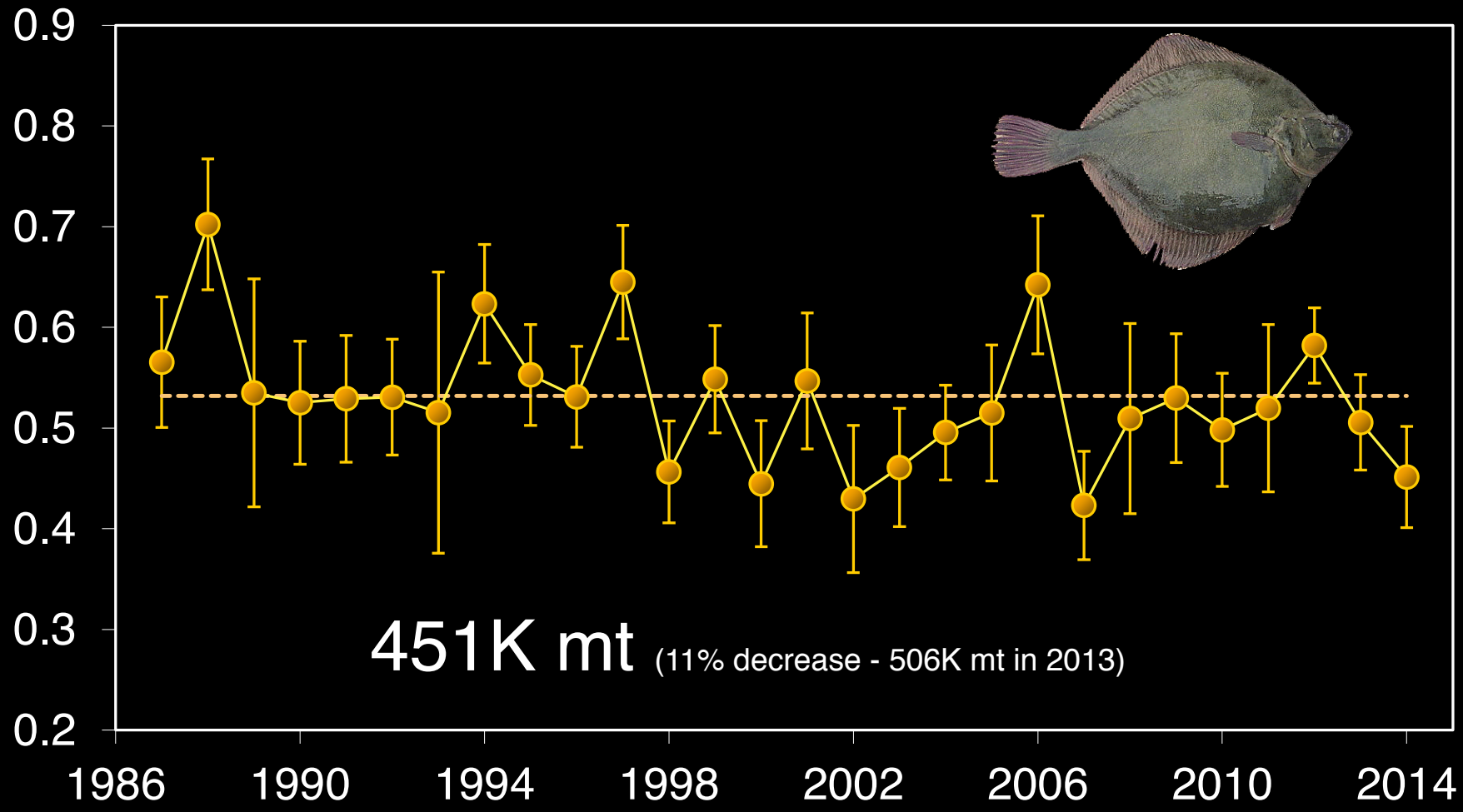
BT survey results

Bering flounder



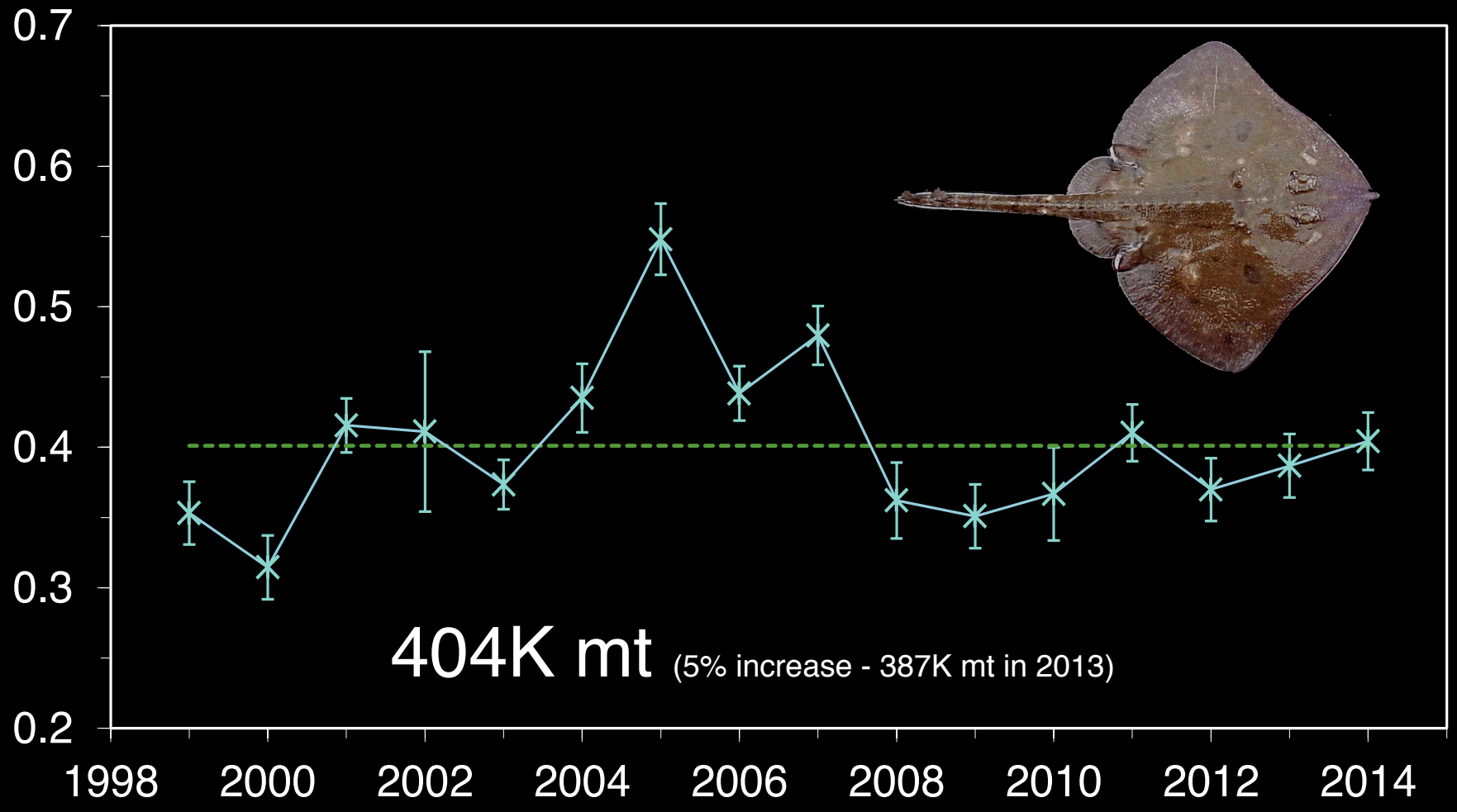
BT survey results

Alaska plaice



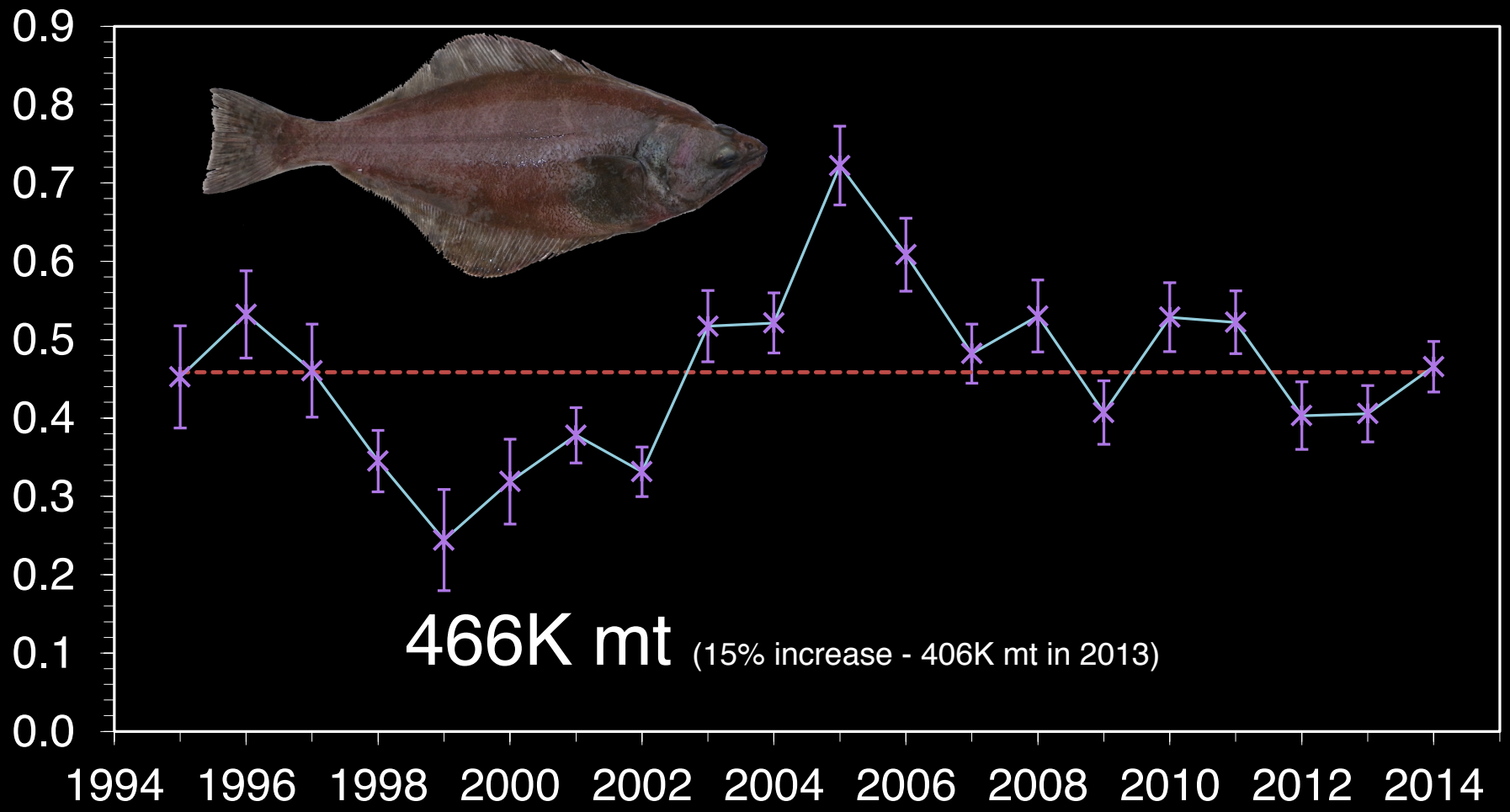
BT survey results

Alaska skate



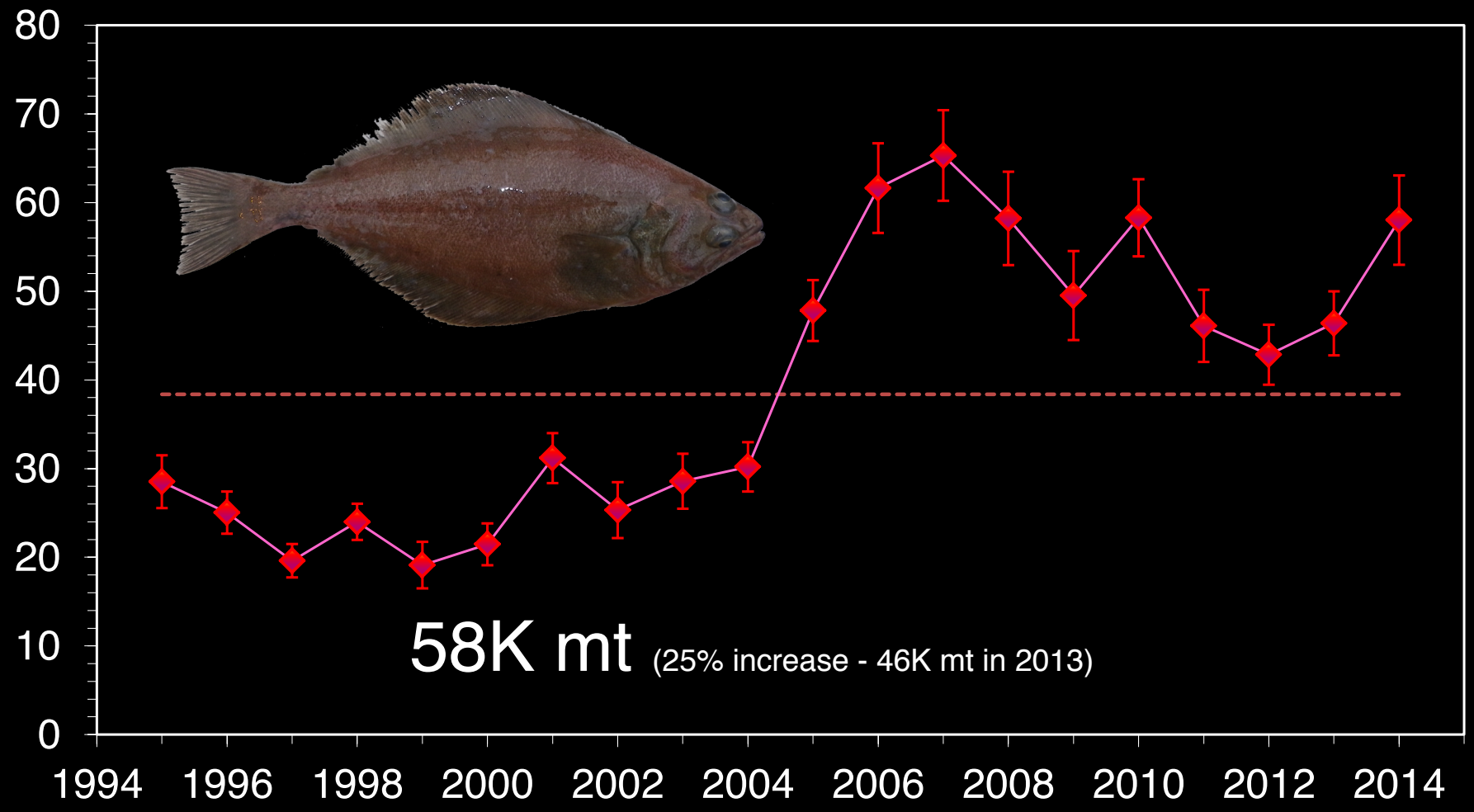
BT survey results

Arrowtooth flounder



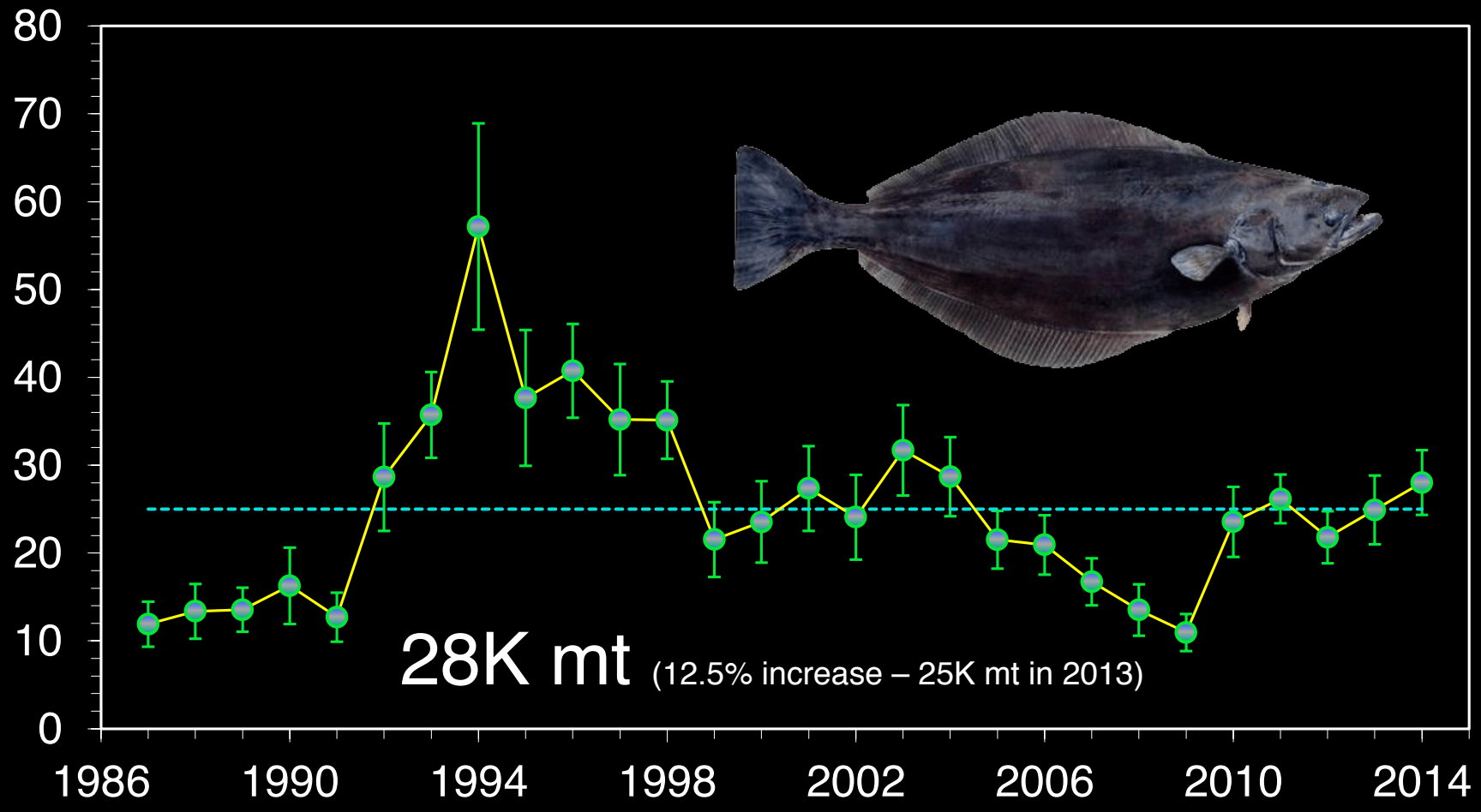
BT survey results

Kamchatka flounder



BT survey results

Greenland turbot



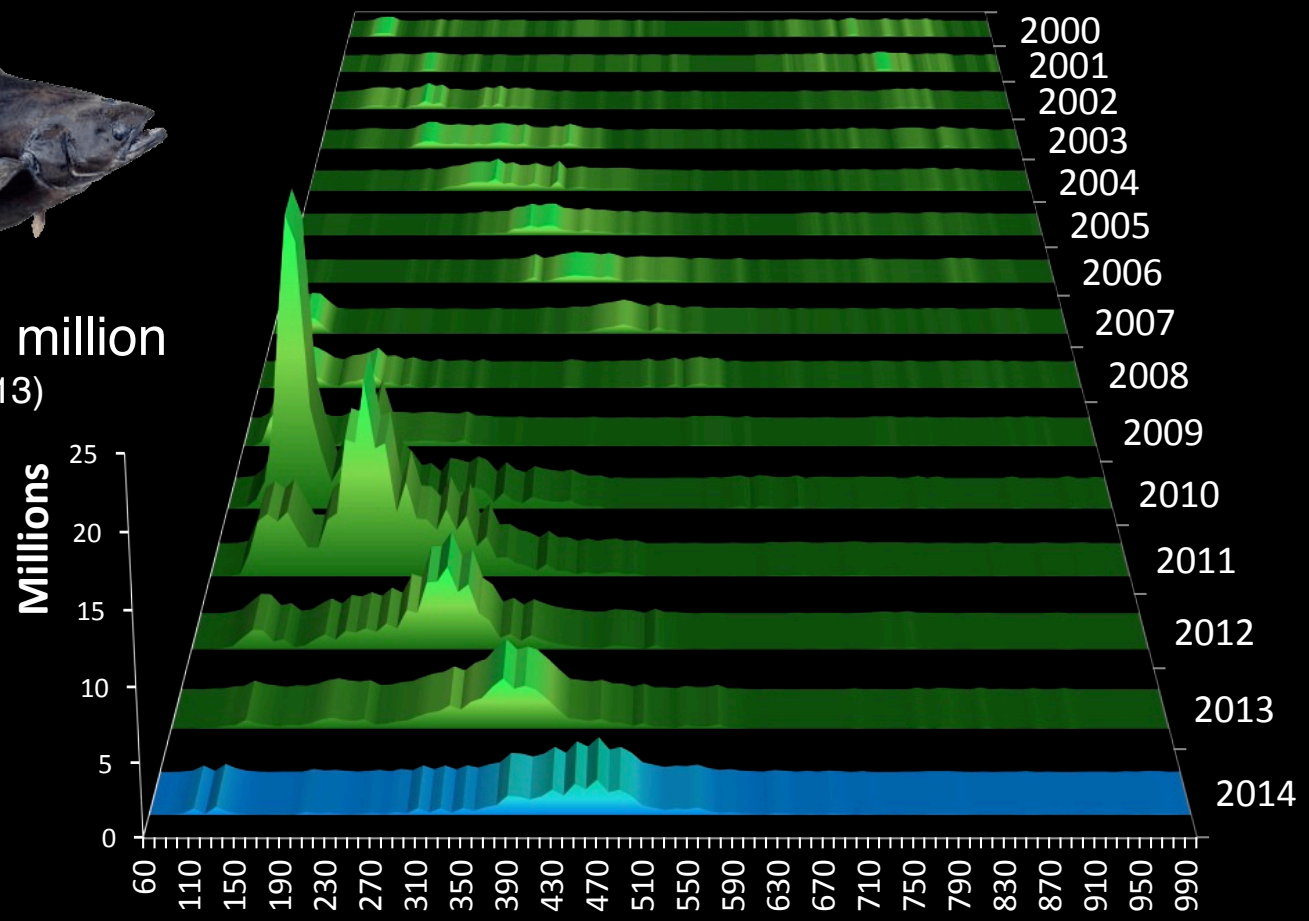
BT survey results

Total abundance-at-length

Greenland turbot

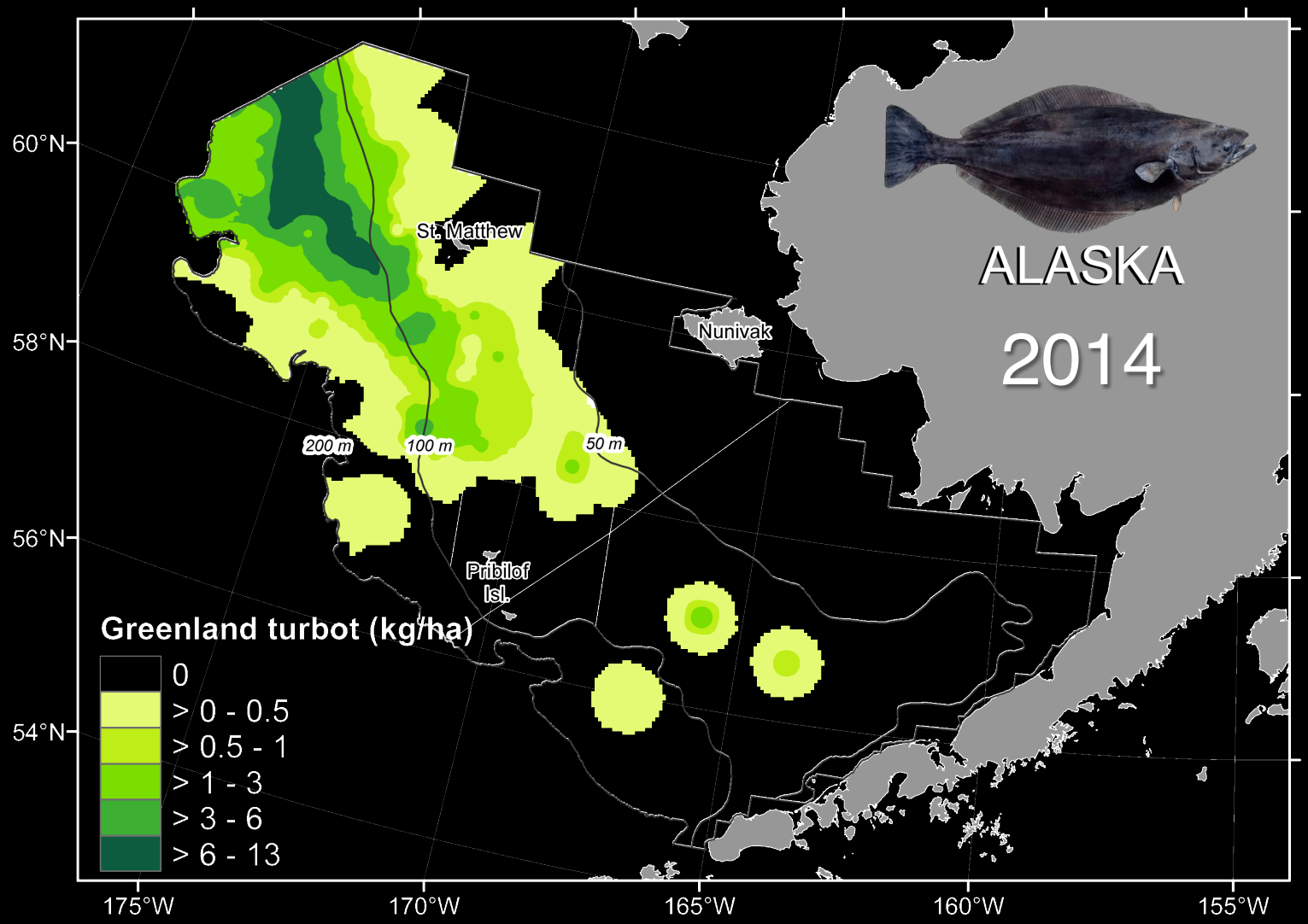
Tot. abund. = 30.2 million

(43.9 million in 2013)



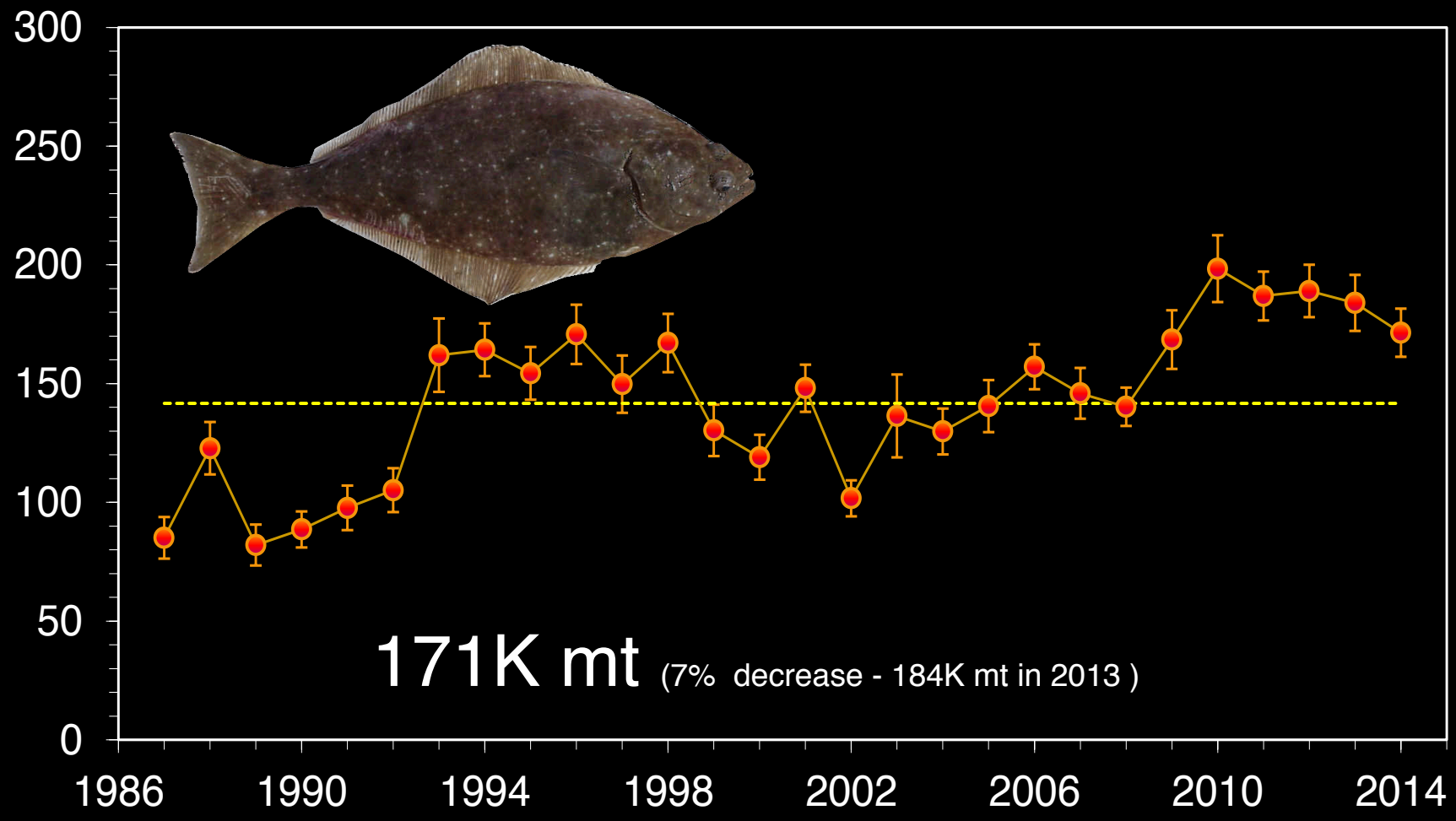
Distribution and Abundance

Greenland turbot



BT survey results

Pacific halibut



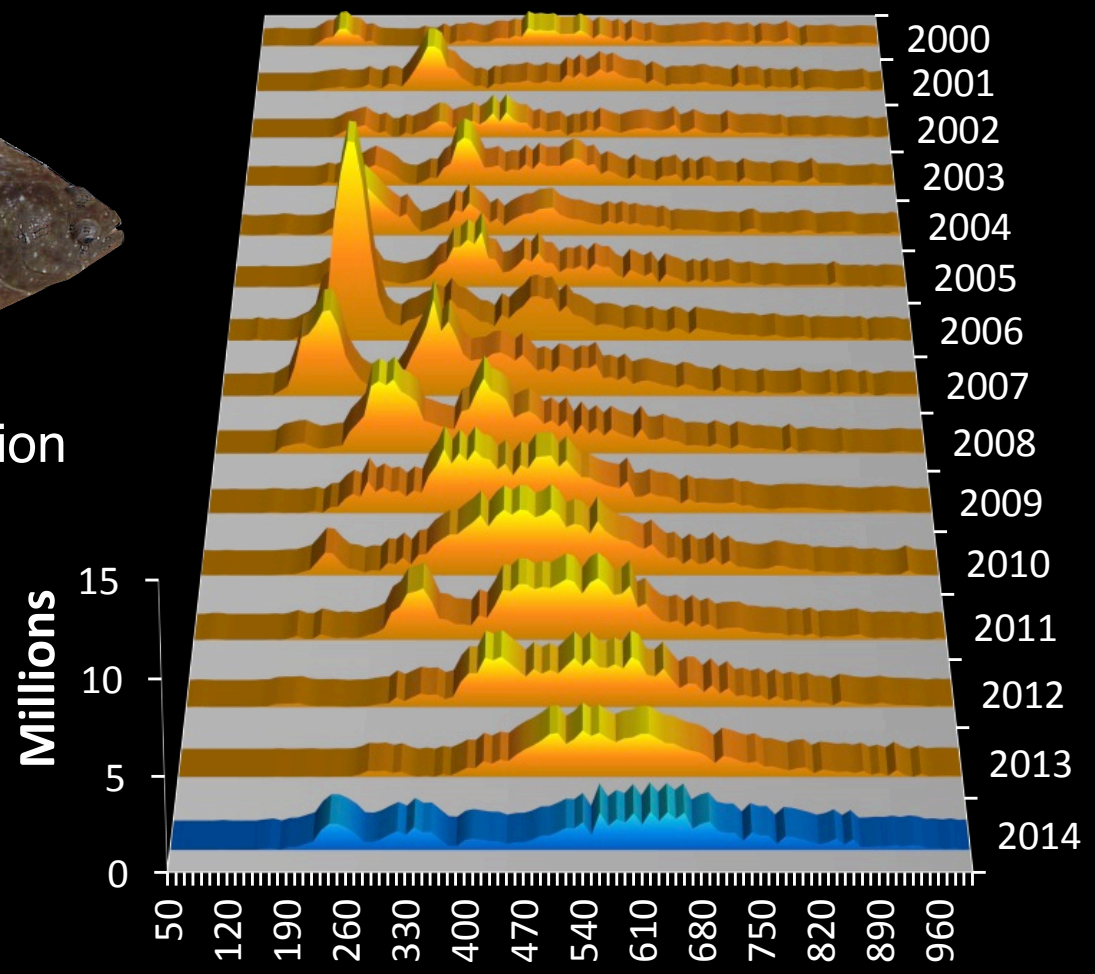
BT survey results

Total abundance-at-length

Pacific halibut

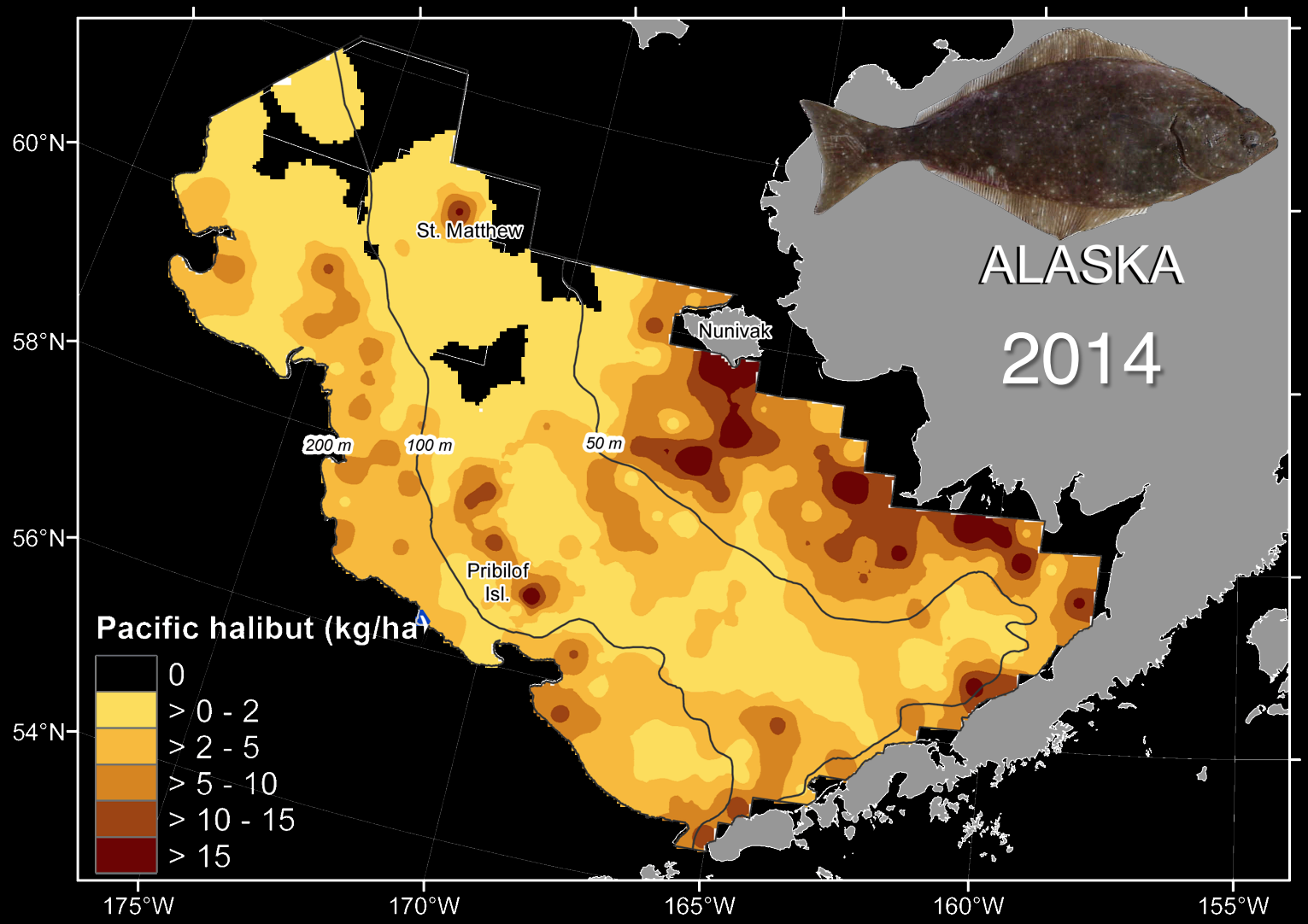
Tot. abund. = 62 million

(64.4 million in 2013)



Distribution and Abundance

Pacific halibut



miscellaneous

New variance estimator

-Variance due to species-specific catchability likely larger than variance estimates for survey catch samples

- research focus will be on understanding catchability rather than finding new variance estimator