

Science, Service, Stewardship



Otolith Workshop
19-20 April 2011 - Juneau AK

Southeast Coastal Monitoring (SECM) surveys to sample otolith-marked salmon stocks

*Emily Fergusson, Joe Orsi, and
Molly Sturdevant
Auke Bay Laboratories*

**NOAA
FISHERIES
SERVICE**



National Oceanic & Atmospheric Administration
U.S. Department of Commerce

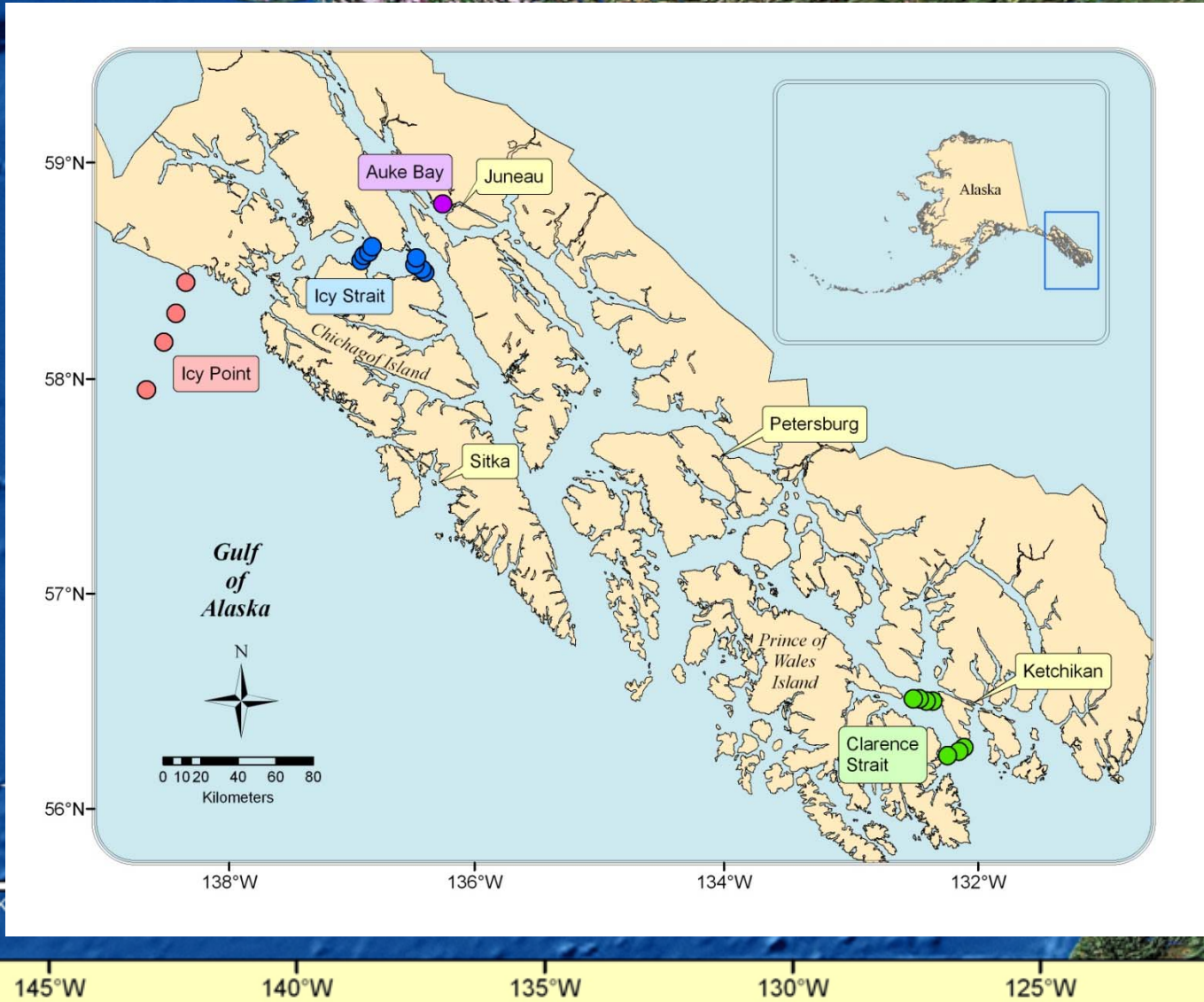


Presentation outline

- ❖ What is SECM ?...project overview
- ❖ Recoveries of otolith-marked juveniles
- ❖ Stock composition observed in catches
- ❖ Stock-specific migration patterns
- ❖ Process studies using otolith marks
- ❖ Questions?

SECM sampling stations in Southeast Alaska

May, June, July, August

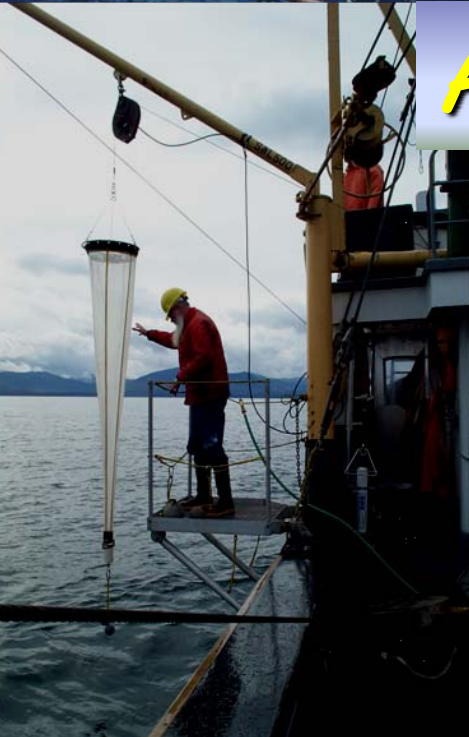


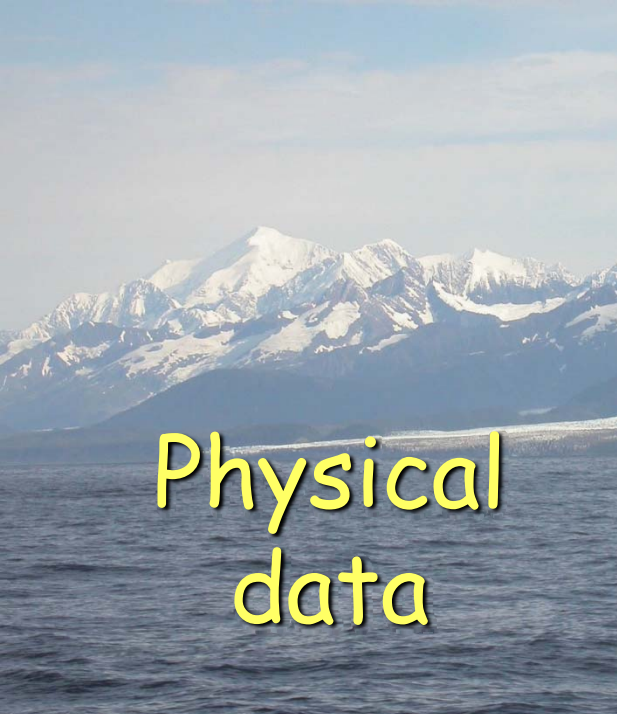


Routine sampling at each station includes:

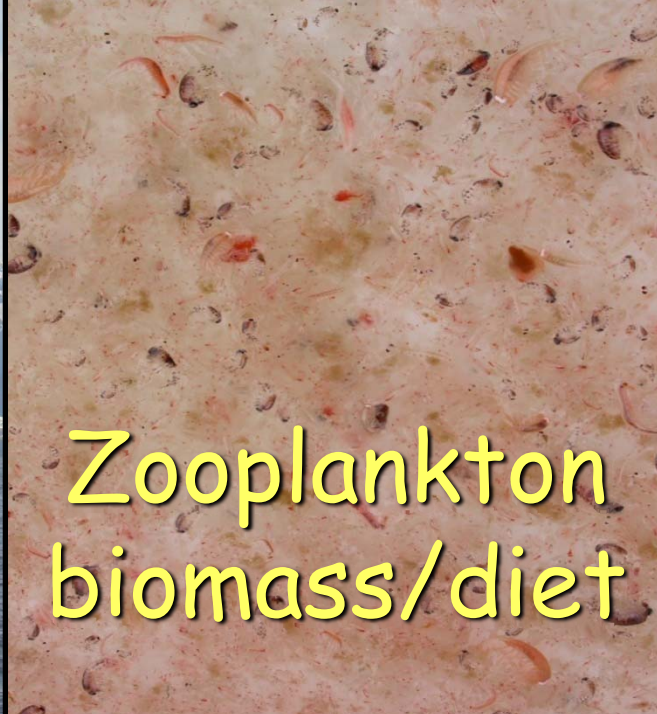
- CTD profile to 200 m
- 20-m vertical NORPAC
- 200-m oblique Bongo
- 20 min rope trawl haul

ABL's SECM project





Physical
data



Zooplankton
biomass/diet



Catches
(CPUE)



Pink

Chum

Size & growth



Pink

Chum

Sockeye

Coho

Stock comp



Predation

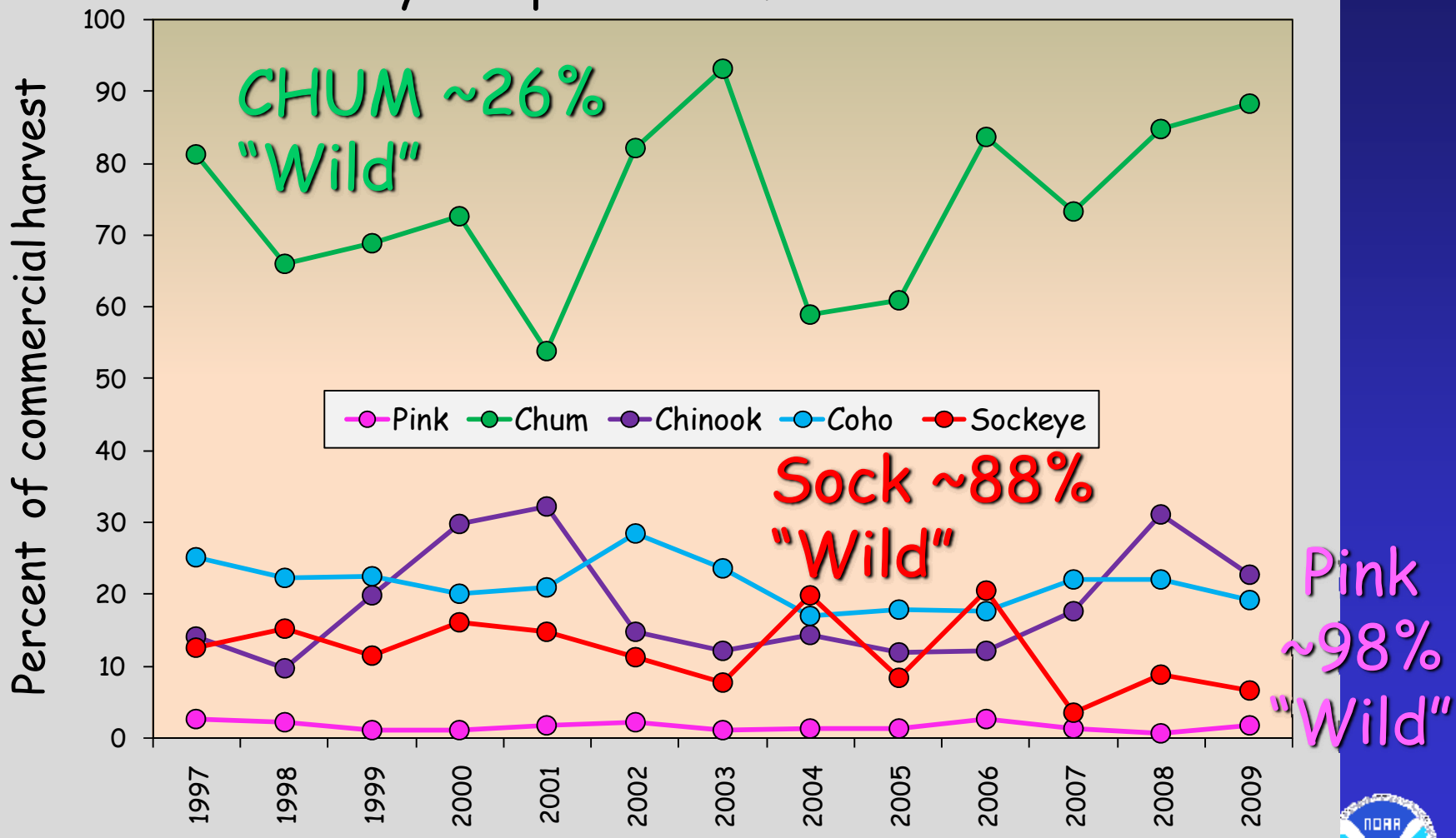
Otolith mark recoveries from juvenile salmon in SE 1997-2009

Region	Pink		Sockeye		Chum	
	Catch	Sample	Catch	Sample	Catch	Sample
NSE 97-09	59,731	129	5,275	3,565	32,060	10,115
SSE 05-07, 09	7,098	106	2,660	1,184	3,294	1,830
Icy Point 97...04	1,971	0	559	251	1,187	898



Harvest reports - annual stock contributions to SEAK 1997-2009

Hatchery composition of salmon in SEAK

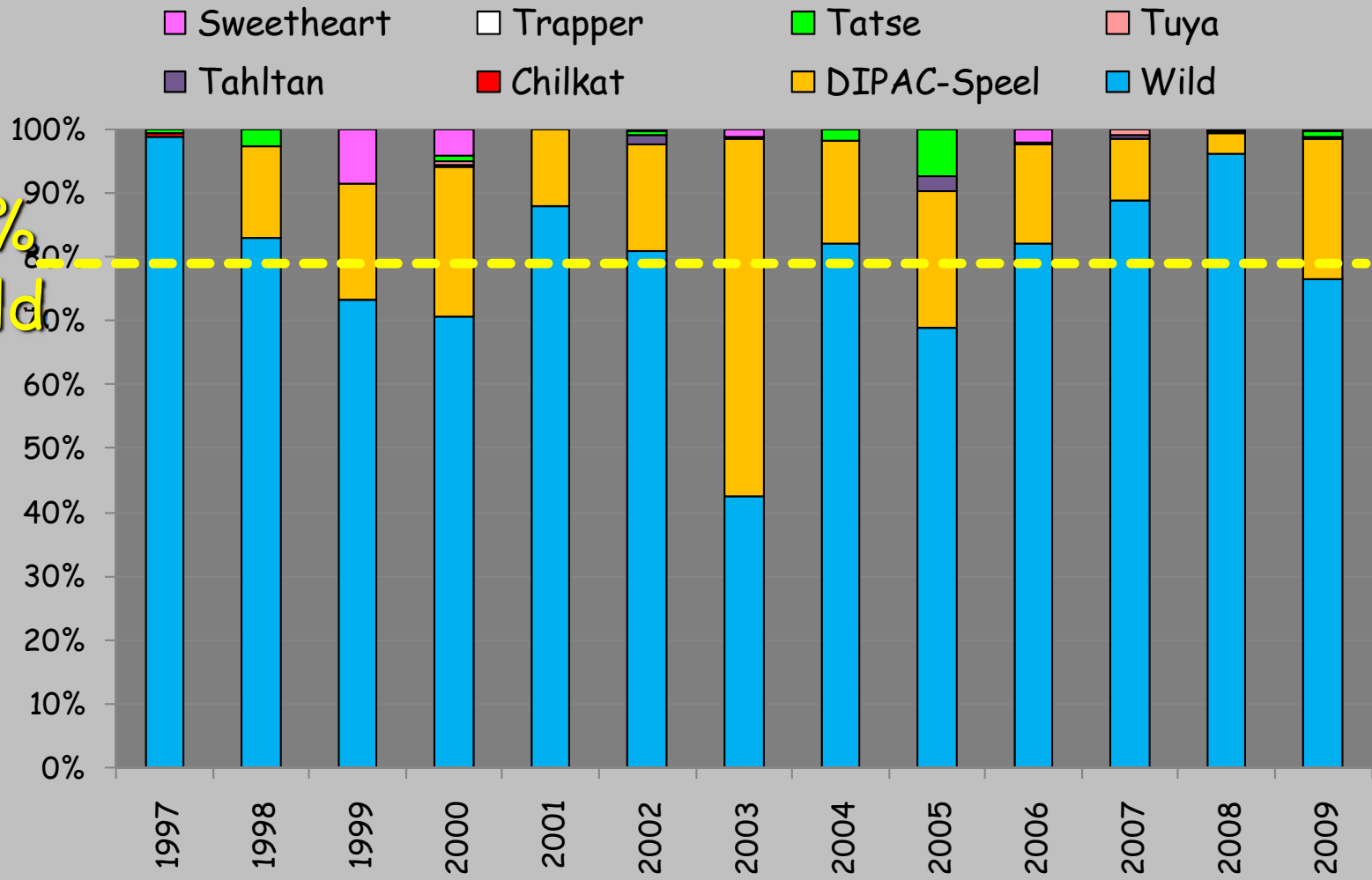


Data sources: ADFG Reg Inf. Reps. (98-04) and AK Enhanc. Prog An. Reps. (05-10)



Icy Strait, stock composition j-SOCKEYE n = 3,553 (June-Aug+)

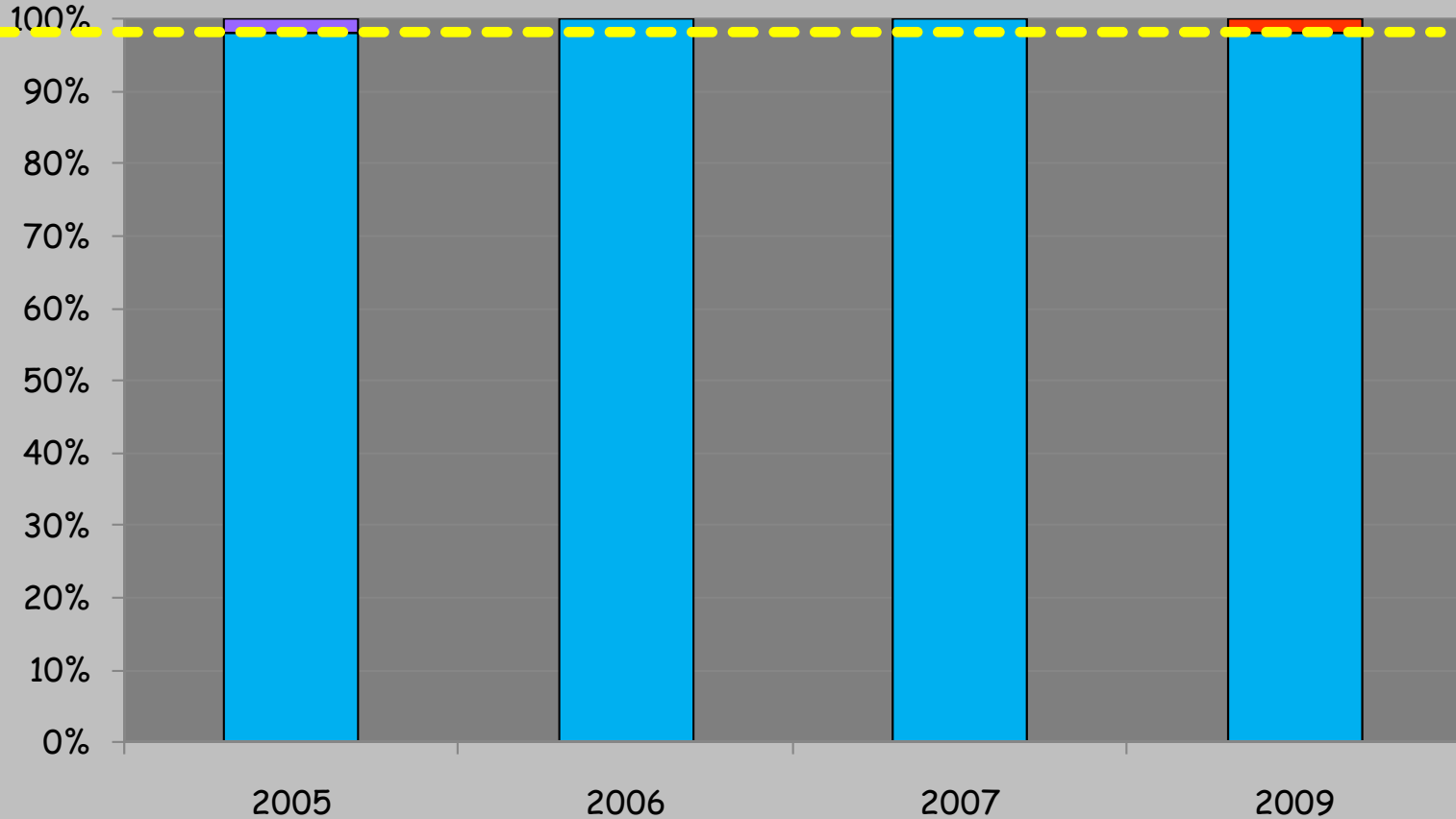
78%
Wild



Clarence Strait, stock composition j-SOCKEYE n = 1,184

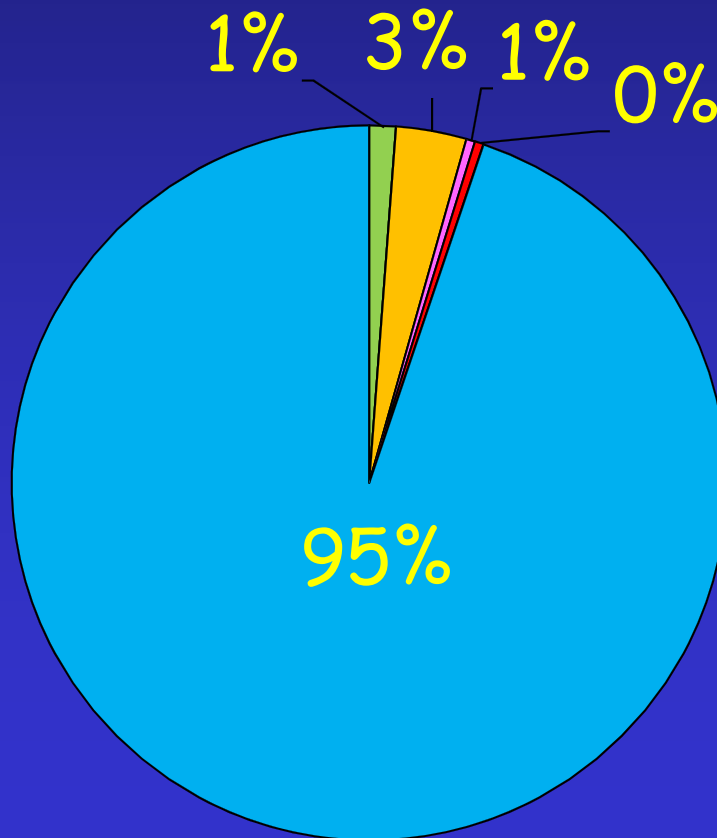
99%
Wild

McDonald -June-July Tahltan -June-July Wild -June-July

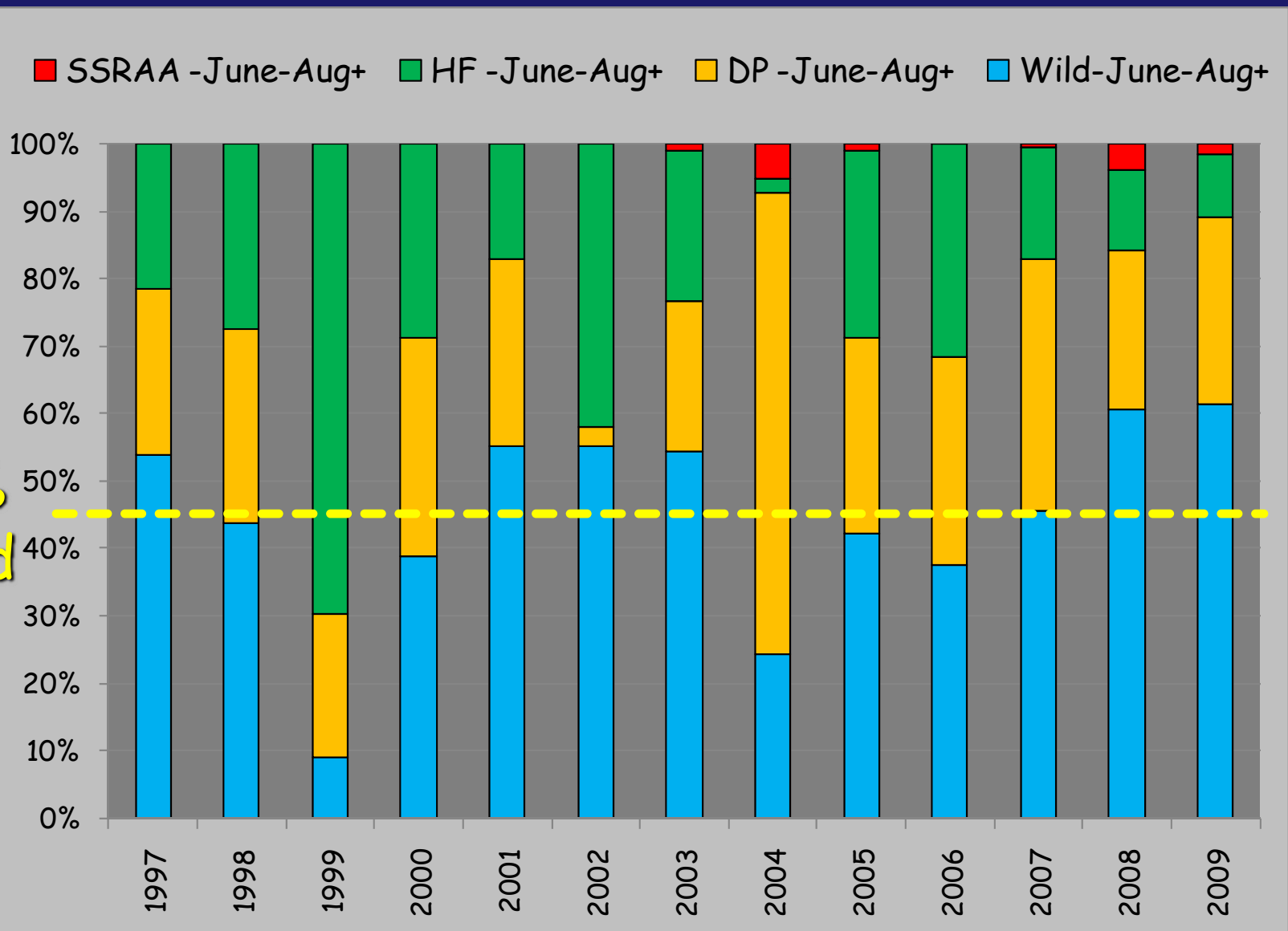


Icy Point, stock composition j-SOCKEYE n = 898 (June-August+)

- Tahltan
- Sweetheart
- Wild
- DIPAC
- Hugh Smith



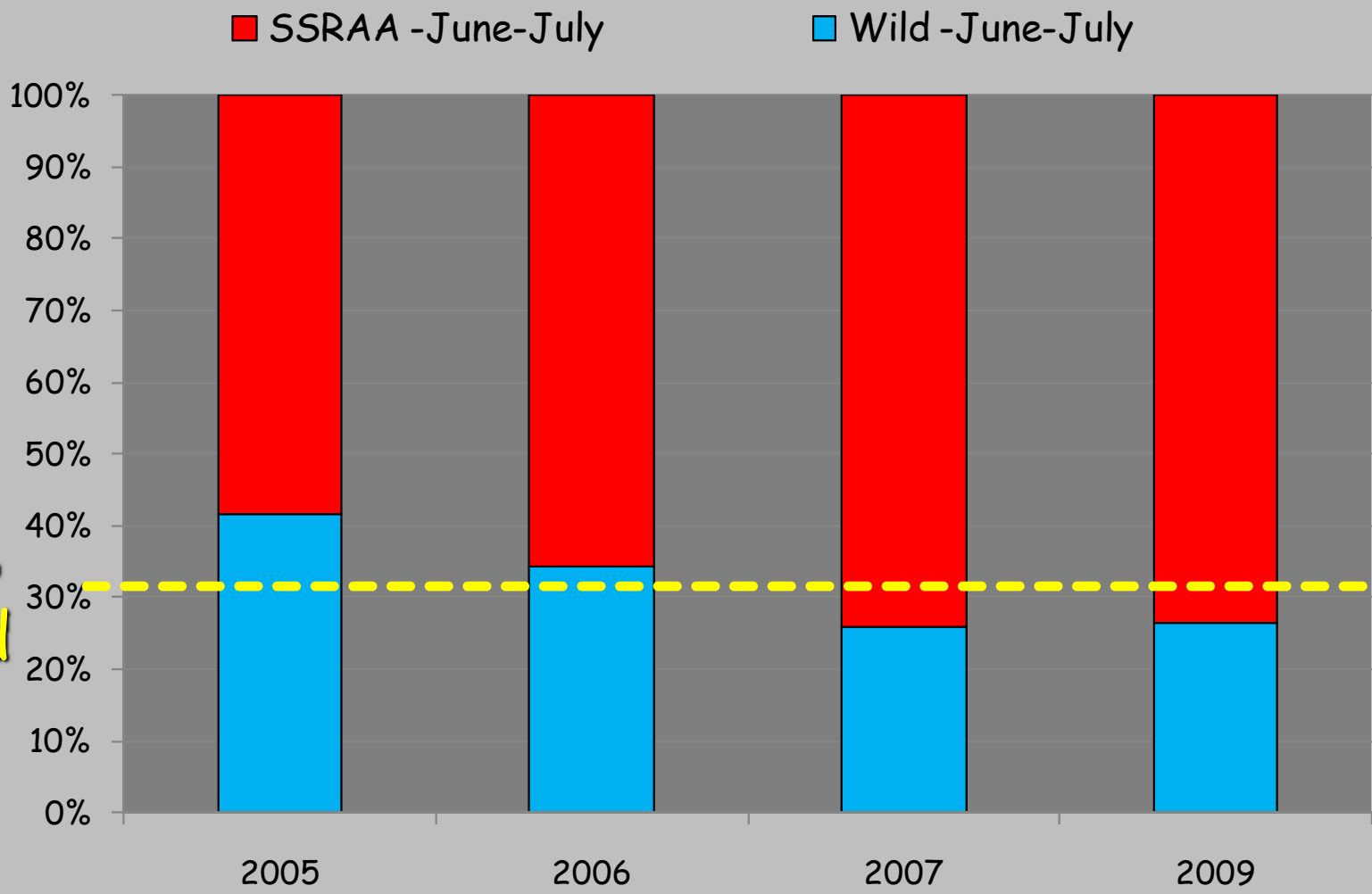
Icy Strait, stock composition of j-CHUM n = 10,115



45%
Wild



Clarence Strait, stock composition j-CHUM n = 1,830

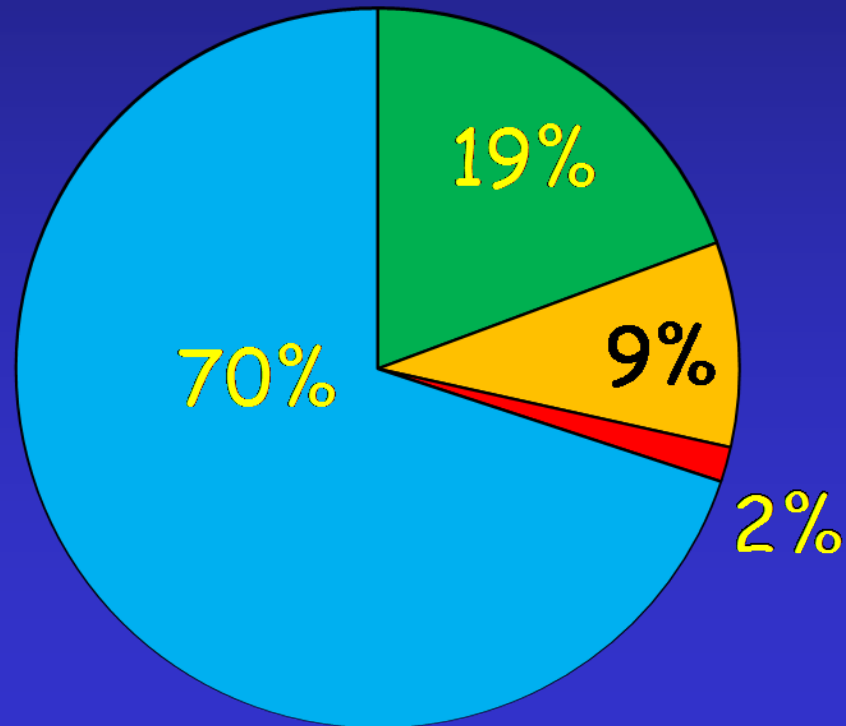


32%
Wild



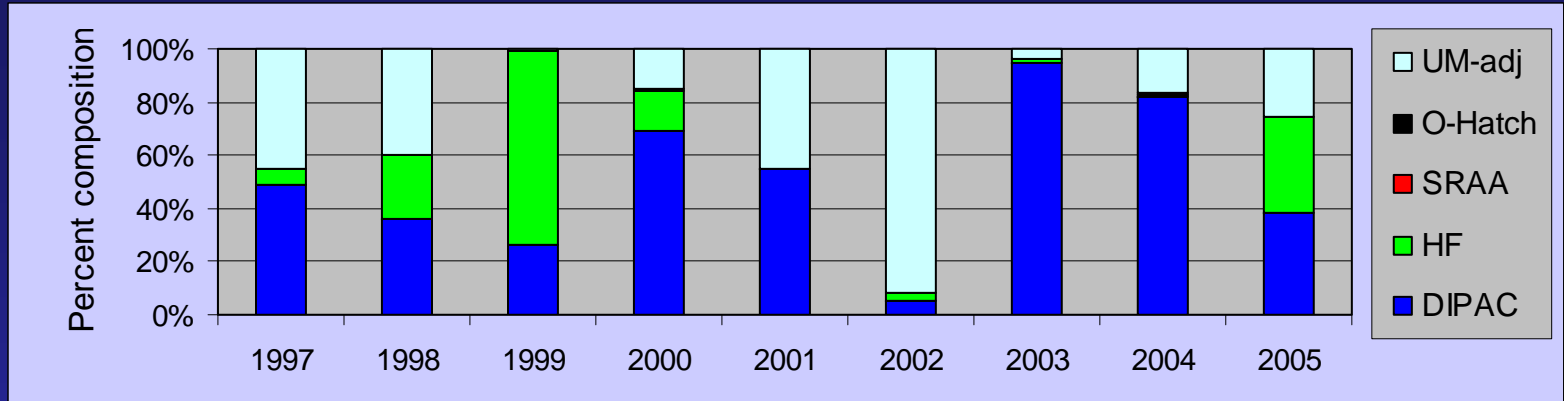
Icy Point, stock composition j-CHUM n = 898 (June-August+)

■ HF ■ DIPAC
■ SRAA ■ Wild

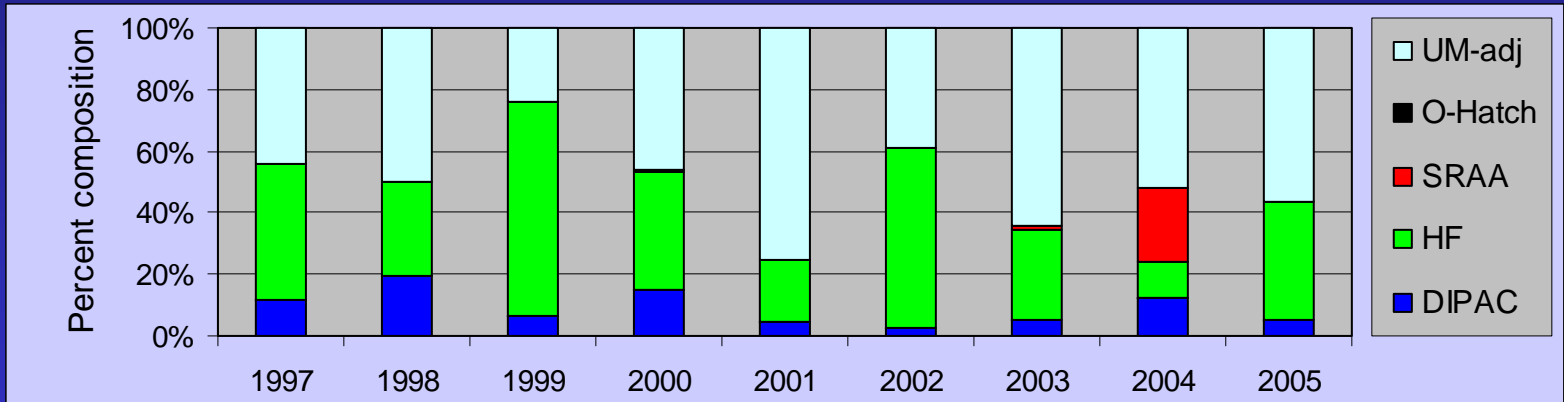


Chum stock composition in Icy Strait, 97-05

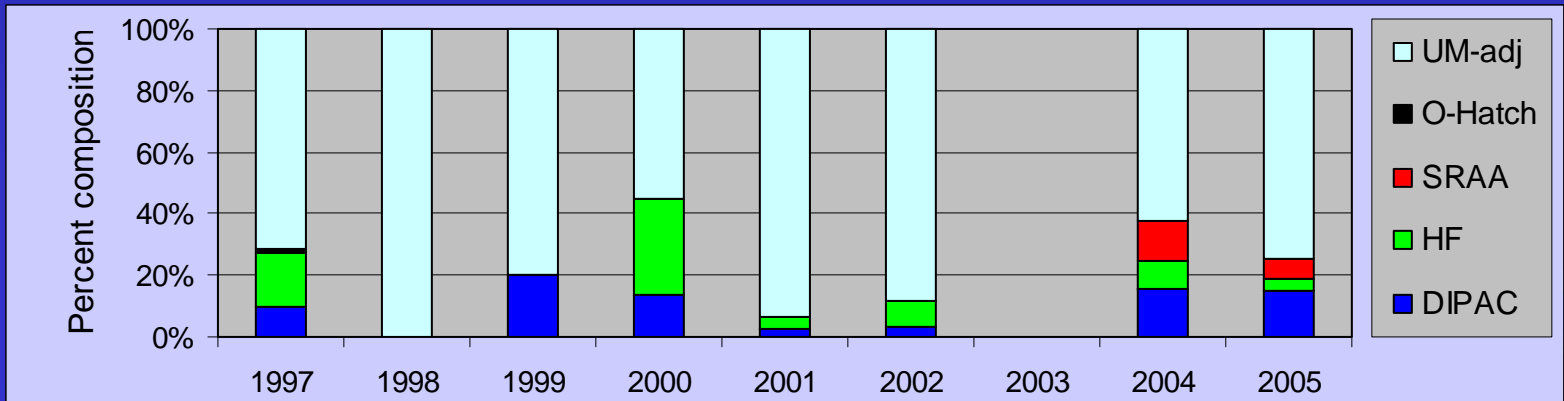
June



July



Aug.



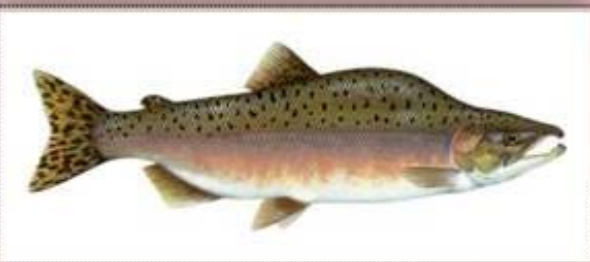
Shameless news flash for 2012...



The Northeast Pacific
~ 25th ~
Pink & Chum Workshop



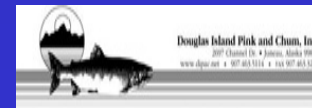
Coming next year...
13-15 February 2012



★ Juneau
Alaska ★



School of
Fisheries &
Ocean Sciences



Using otoliths for salmon process studies

Stock-specific energy density

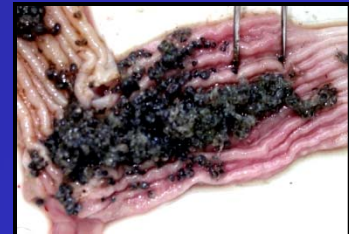
Calorimetry on juv. subsamples selected by marks



Stock-specific diets

Stomach analysis on juv. subsamples

Bioenergetic modeling of zooplankton consumption



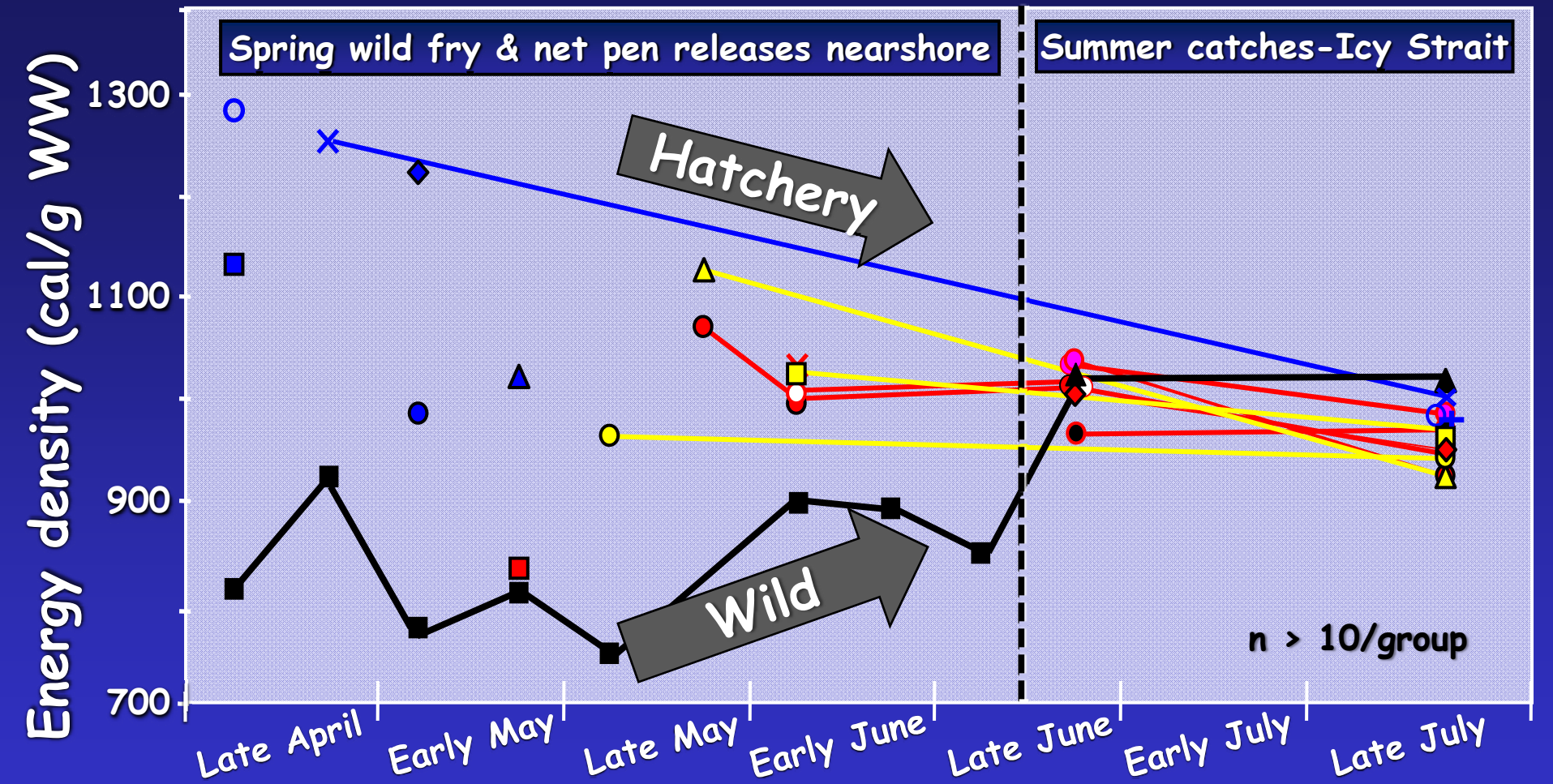
Predation interactions between salmon

Stomach analysis

ID origins of salmon predators & salmon prey



Seasonal energy density of W & H juv. chum salmon



DIPAC

NSRAA

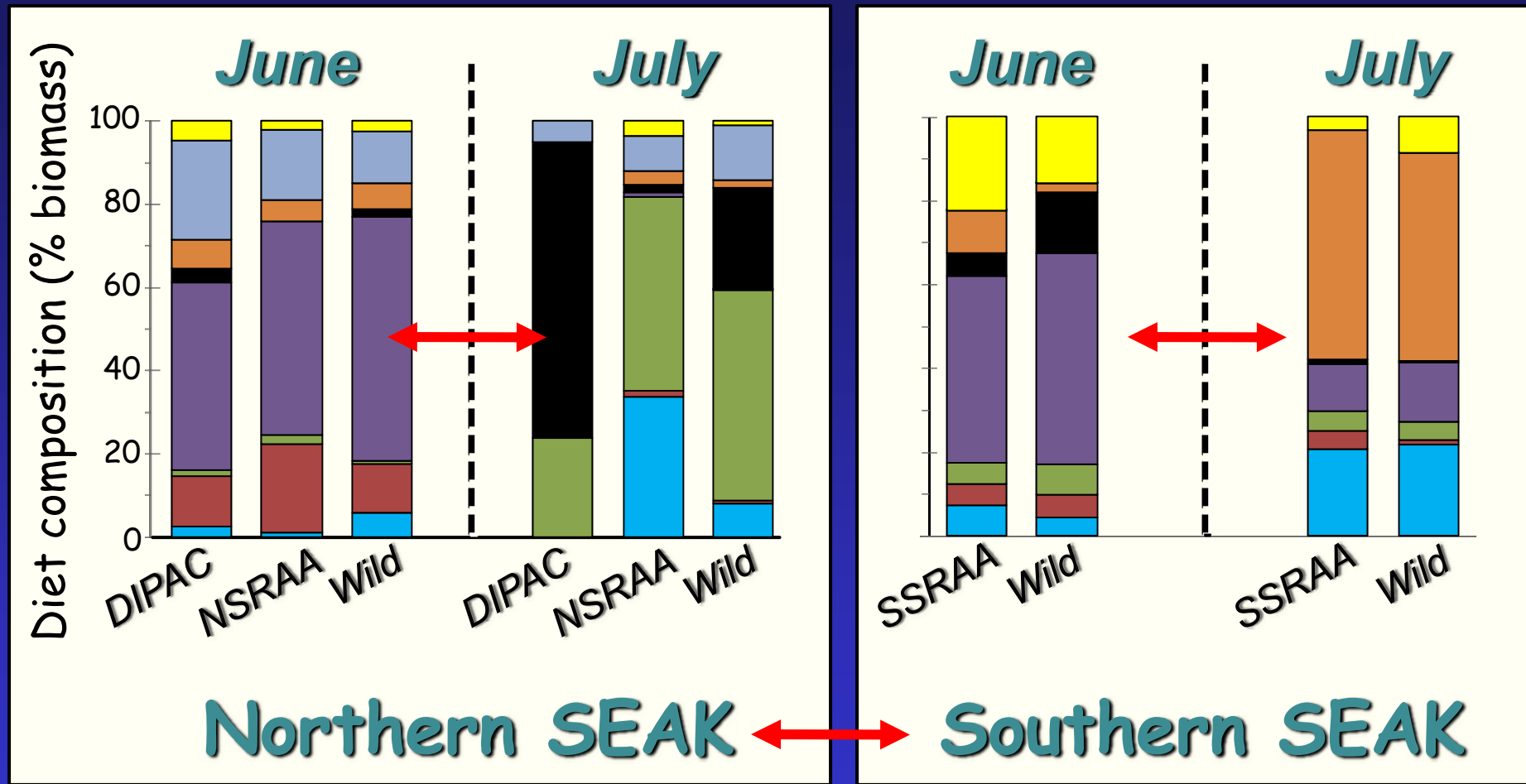
SSRAA

Wild

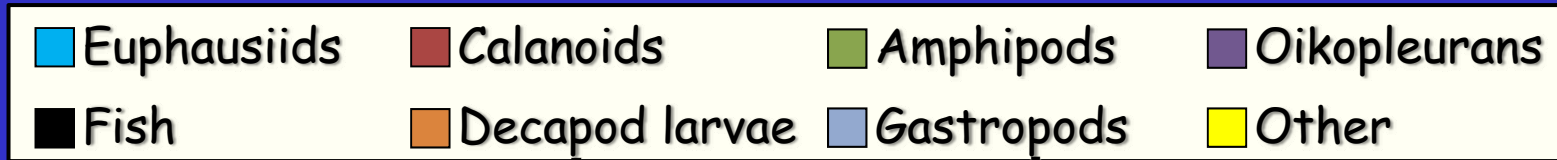
- Amalga ER ✕ Boat Hbr. L/L ▲ Kasnyku ◆ Anita-summer ○ Anita ■ Wild-Taku Inlet
- Amalga L/L ● Boat Hbr. □ Keenyku L/L ○ Kendrick-summer + Kendrick ▲ Wild-Icy Strait
- Gastineau L/L ◆ Limestone ■ Nakat-summer ● Nakat-fall

Take home message: W & H chum energy density converges by summer

Diet of W & H juvenile chum salmon stocks, 2005



n > 10/group



Take home message: diet differs little between salmon stocks in summer

Stock-specific consumption of zooplankton from bioenergetic modeling of juv. W & H chum salmon



Zooplankton consumed (MT/km²)

0.0020
0.0010
0.0000

Icy Strait
2001

- Hidden Falls Hatchery
- Macaulay Hatchery
- Unmarked ("wild")

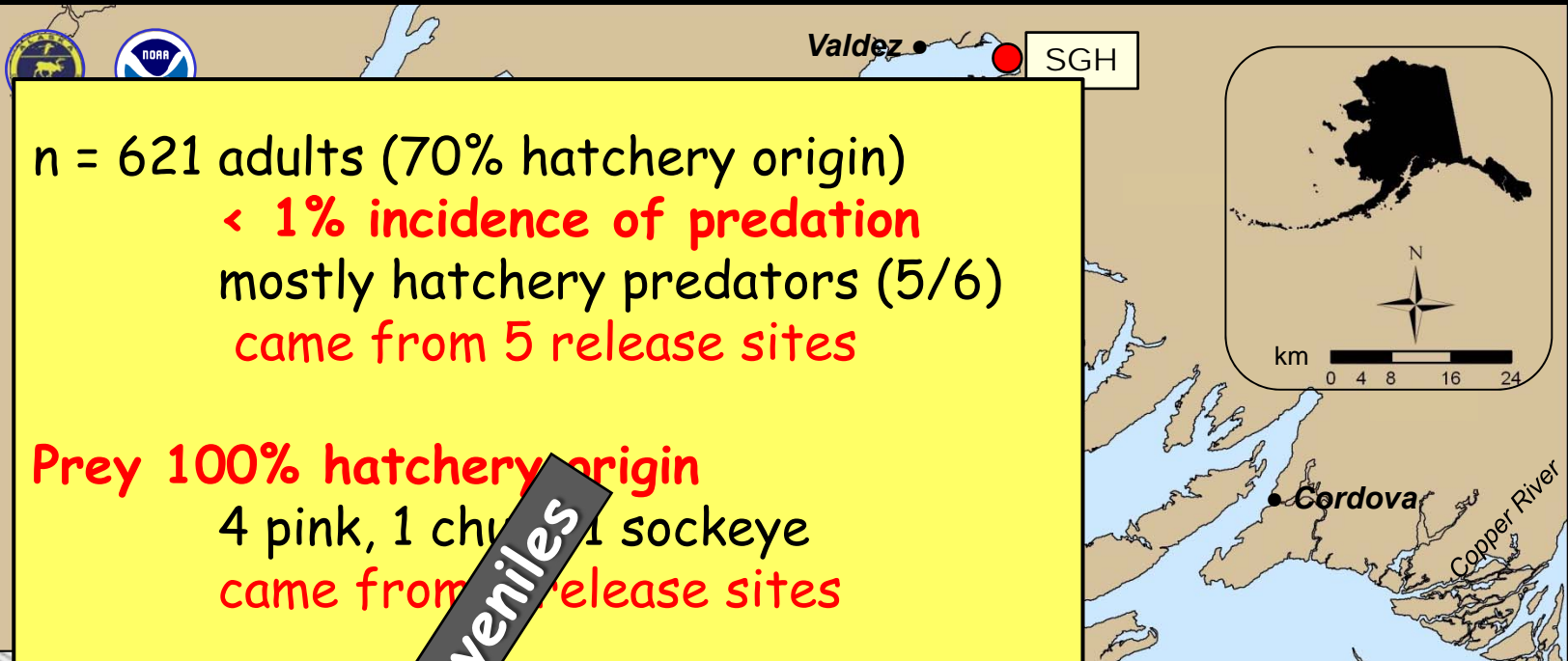
Orsi et al. 2004
Rev. Fish. Biol. & Fisheries

June July August September



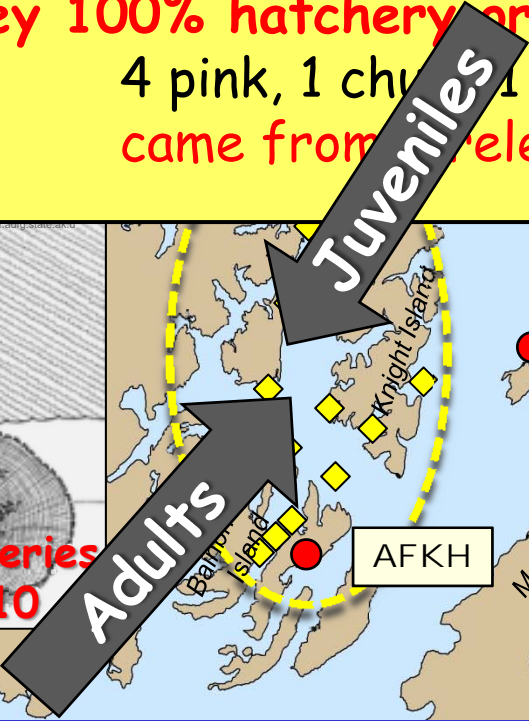
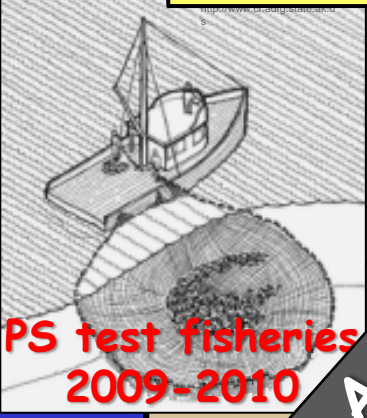
Take home message: chum salmon consume < 0.1% of available zooplankton

Predator-prey salmon interactions in PWS



n = 621 adults (70% hatchery origin)
 < 1% incidence of predation
 mostly hatchery predators (5/6)
 came from 5 release sites

Prey 100% hatchery origin
 4 pink, 1 chum, 1 sockeye
 came from 5 release sites



Origin		Predators	
		Wild	Hatchery
Prey	Wild	0	0
	Hatchery	1	5

Take home message: Low rates, but many stocks interact via predation in SW

Science, Service, Stewardship



For more of our research
information:

Google:

**Southeast Alaska
Coastal Monitoring**

**NOAA
FISHERIES
SERVICE**

NOAA



DIPAC, NSRAA, & SSRAA Hatcheries

ADFG Cordova, Ketchikan, Juneau

Biologist, technician & student help

Vessel captains & crews

Funding: AKSSF & PSC-Northern Fund

Ecotrust Copper River Program

NOAA Admin.

Thanks! - Questions?



**NOAA
FISHERIES
SERVICE**

Otolith Workshop
19-20 April 2011
Juneau, AK

