

# NPRB GOA IERP



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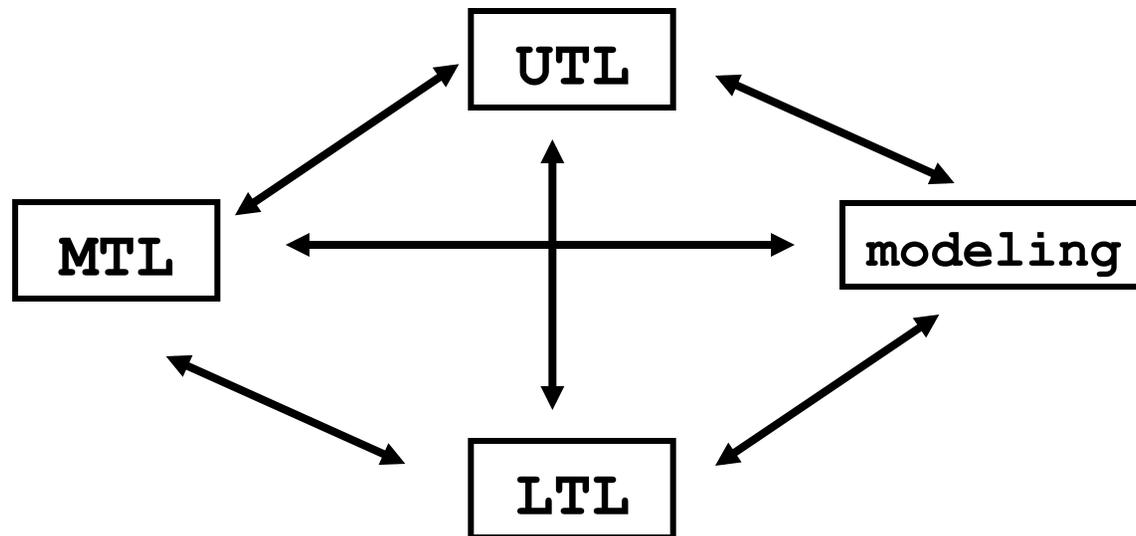
# overview

- 1) creation
- 2) goals and hypotheses
- 3) objectives
- 4) summary

# creation: origins

## GOA IERP implementation plan:

"How do environmental and anthropogenic processes, including climate change, affect trophic levels and dynamic linkages among trophic levels, with emphasis on fish and fisheries, marine mammals, and seabirds within the Gulf of Alaska?"



# creation: timeline

June 2009: UTL awarded to Moss et al.

January 2010: MTL and LTL provisional awards

March 2010: revised MTL & LTL, modeling due

May 2010: MTL & LTL awards, 1<sup>st</sup> big meeting

June 2010: modeling awarded

April - October 2010: pilot studies

May 2010 - present: PIs wrangle endlessly..

July 2010 - present: NOAA PIs tear hair out over budget

April 2011: fieldwork begins

# project management

## the "GABI":

Jamal Moss (UTL; AFSC; chair)

Olav Ormseth (MTL; AFSC)

Russ Hopcroft (LTL; UAF)

Sarah Hinckley (modeling; AFSC)

## institutions:

AFSC (Seattle and ABL)

UAF

PMEL

UW

Dalhousie

USGS

USFWS

OSU

# component goals

**UTL:** improve our understanding of the variability in this ecosystem through regional comparison of recruitment variability in five predatory fish species

**MTL:** describe spatial and temporal variability in the structure of forage communities in the GOA and the effects of this variability on UTL predators.

**LTL:** determine how physical transport mechanisms influence lower trophic levels, and subsequently the survival and recruitment of five species of groundfish targeted by the GOA-IERP UTL program.

**MODELING:** identify how recruitment of five target groundfish species in the GOA is affected by environmental variability in the region.

# almost-finalized IERP hypotheses

## the gauntlet

The primary determinant of year-class strength for marine groundfishes in the GOA is early life survival, which is regulated by climate-driven variability in a biophysical gauntlet comprising offshore and nearshore productivity, larval and juvenile transport, and settlement into suitable demersal habitat.

## regional comparison

Bottom-up regulation of juvenile groundfishes and forage fishes is common to the eastern GOA and central GOA, but the physical and biological mechanisms of that regulation differ between the two regions.

## interactions

Interactions among species (including predation and competition) are influenced by the population trajectories of individual species and by their habitat requirements, which vary with life stage and season.

# focal species

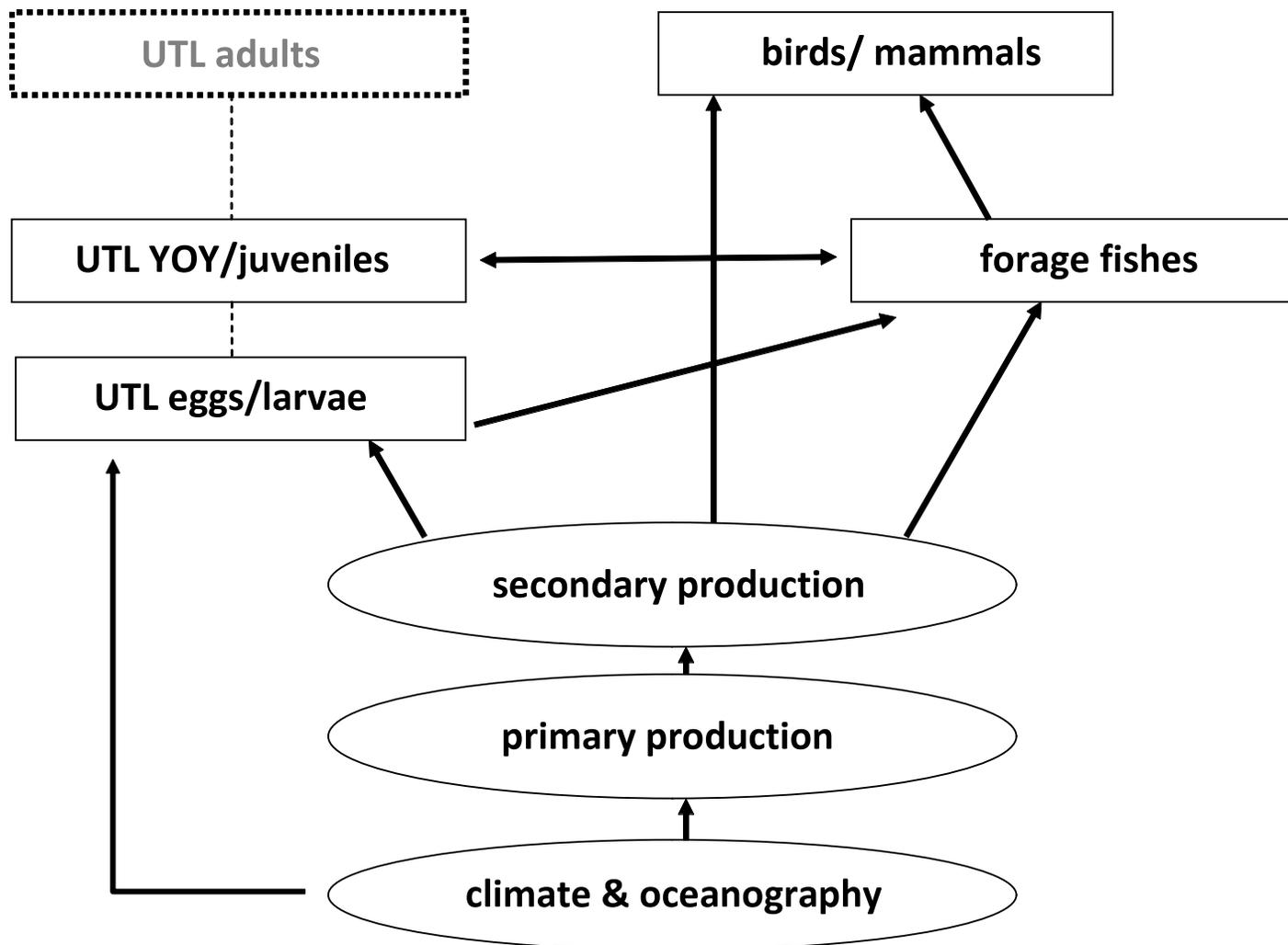
## UTL

Pacific ocean perch  
arrowtooth flounder  
sablefish  
Pacific cod  
walleye pollock

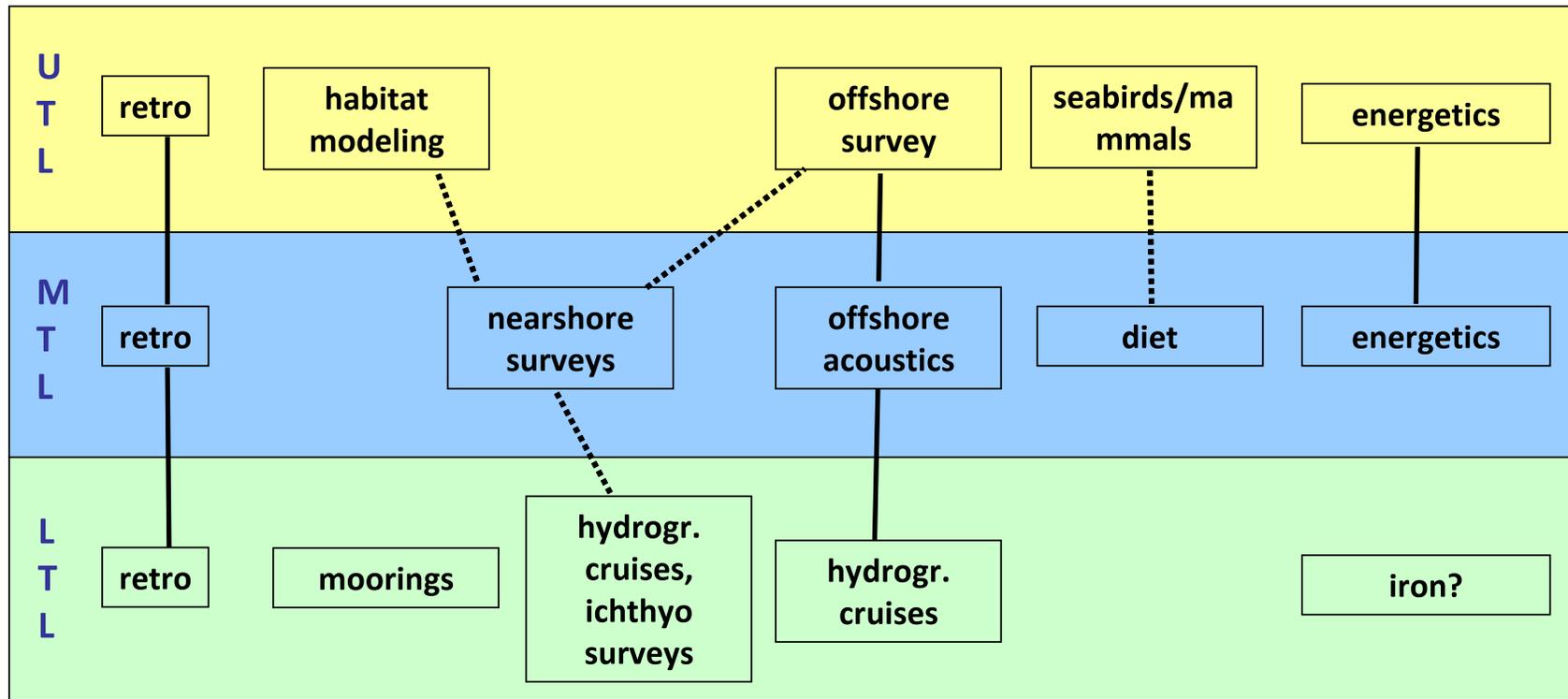
## MTL

capelin  
Pacific sand lance  
Pacific herring  
juvenile cod  
juvenile pollock  
...and?

# GOA IERP conceptual model



# research plan (observations)



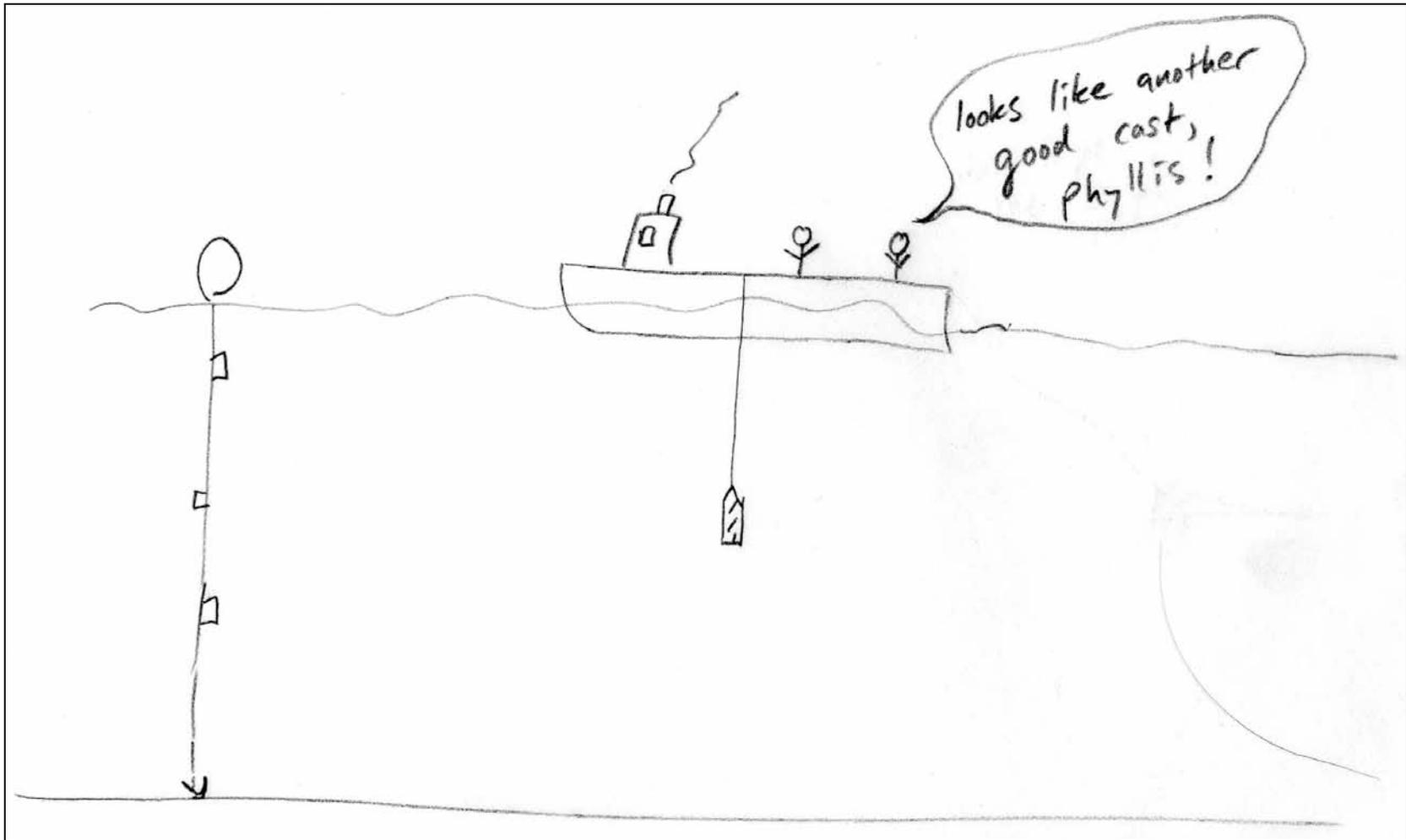
———— direct connection

..... indirect connection

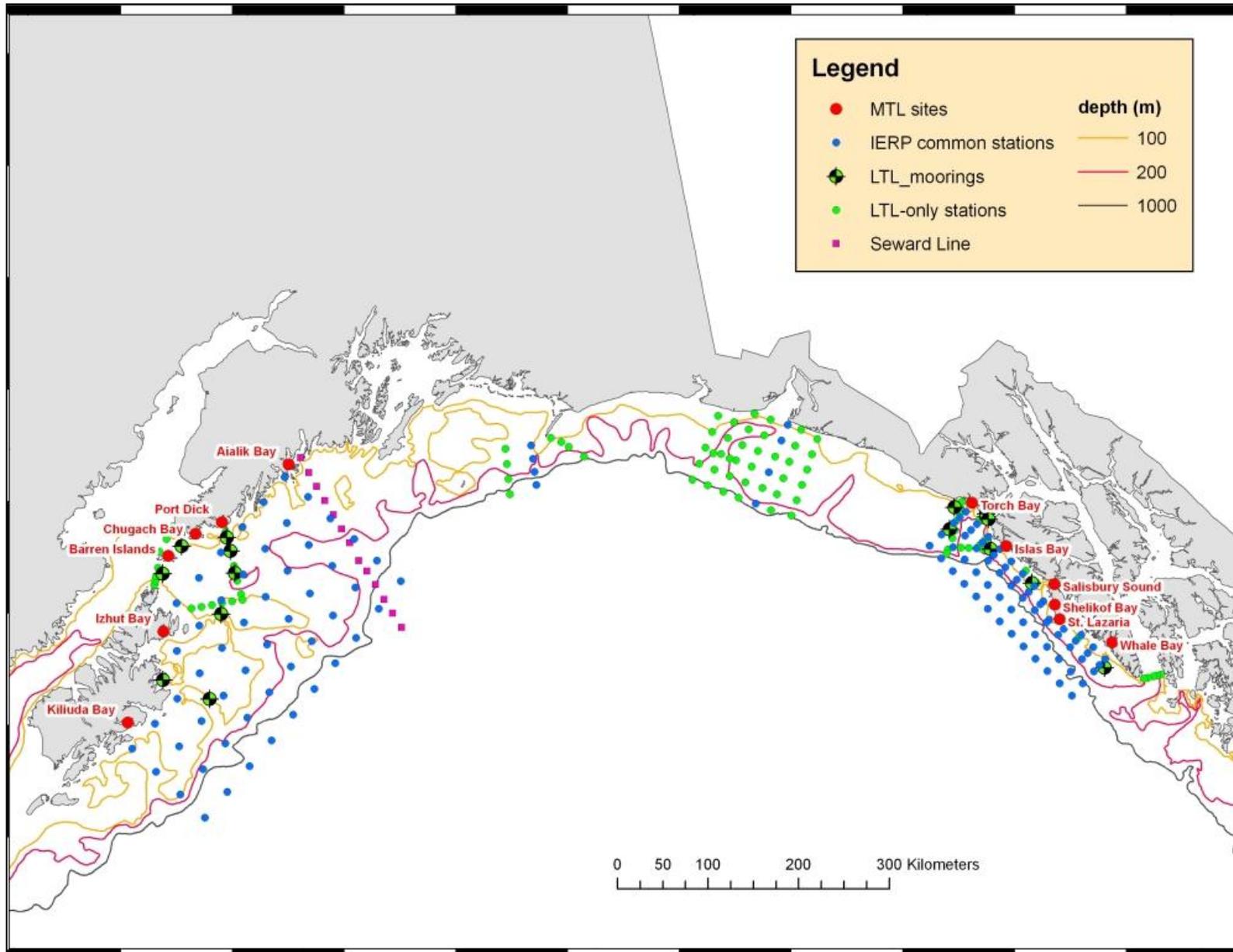
AFSC acoustic surveys

AFSC bottom trawl surveys

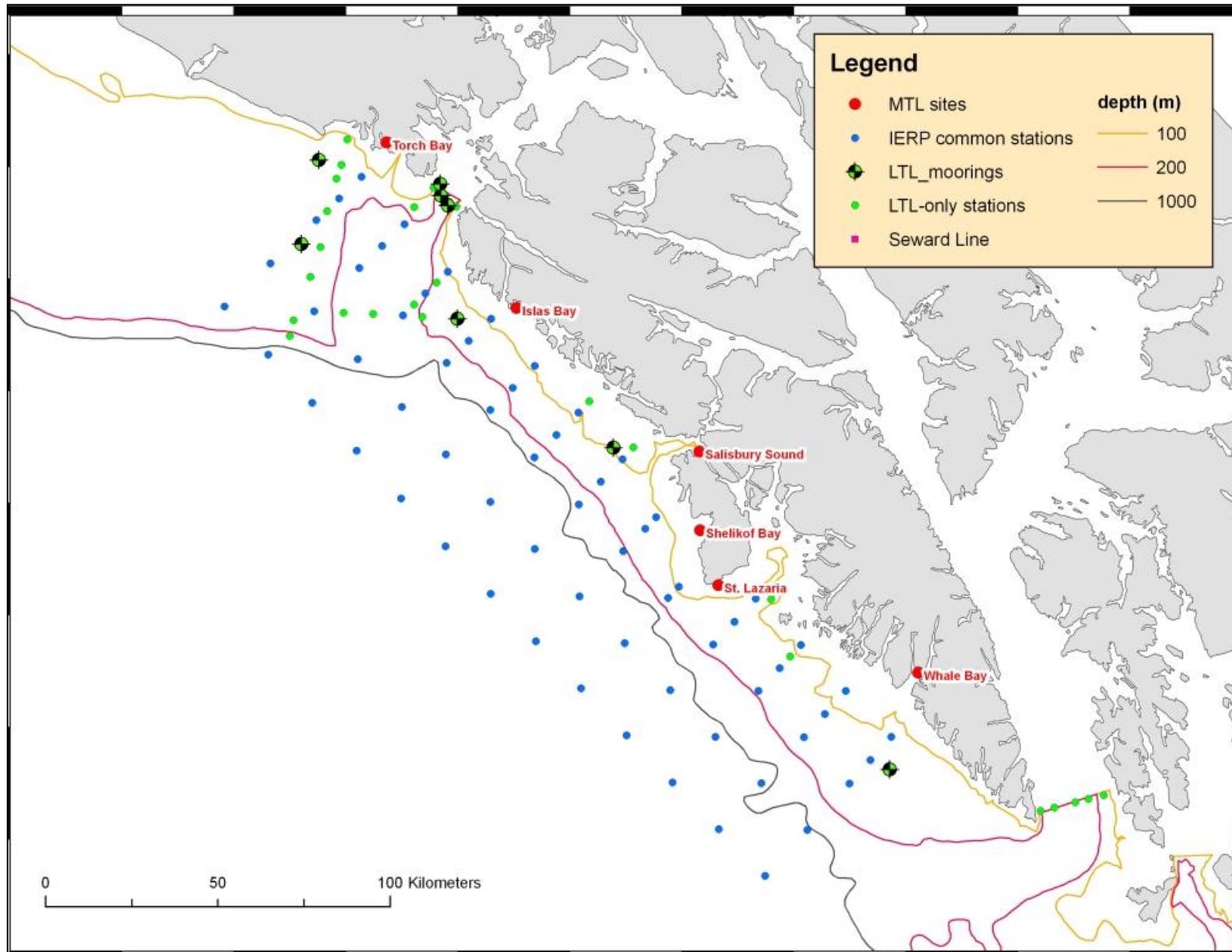
objective #1: quantify climactic and oceanographic mechanisms that control ocean conditions in the EGOA and CGOA



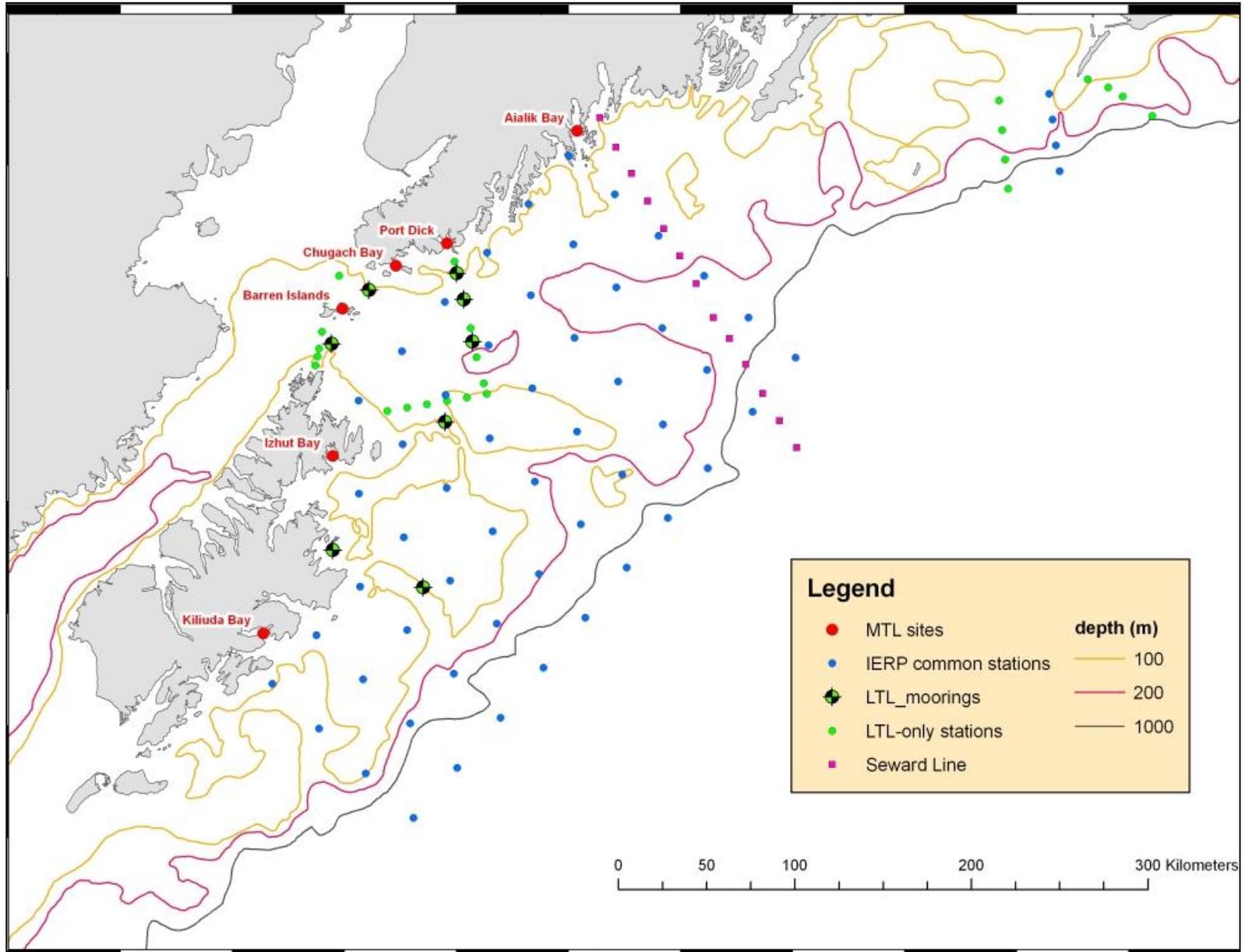
# IERP sampling grid



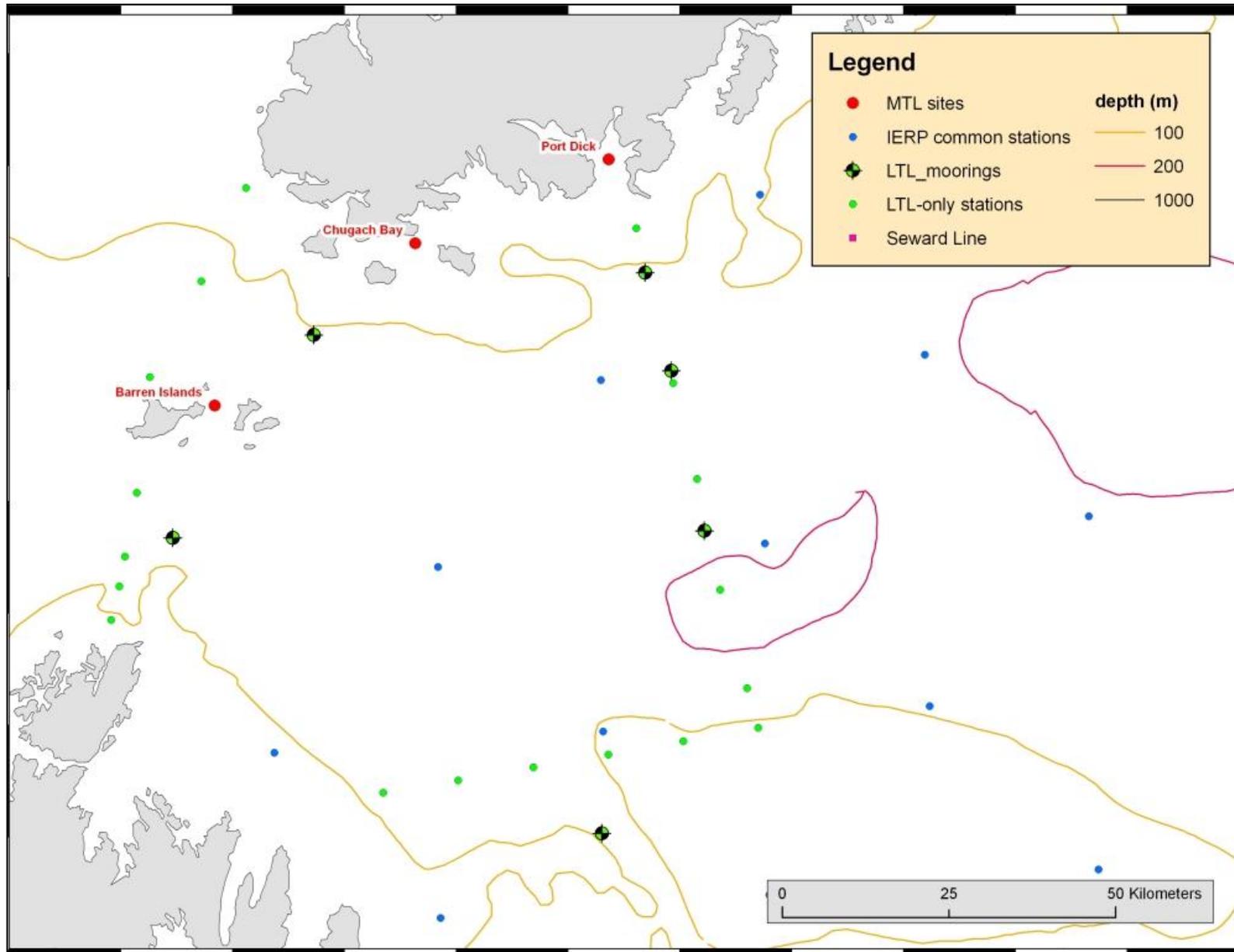
# IERP sampling grid - east



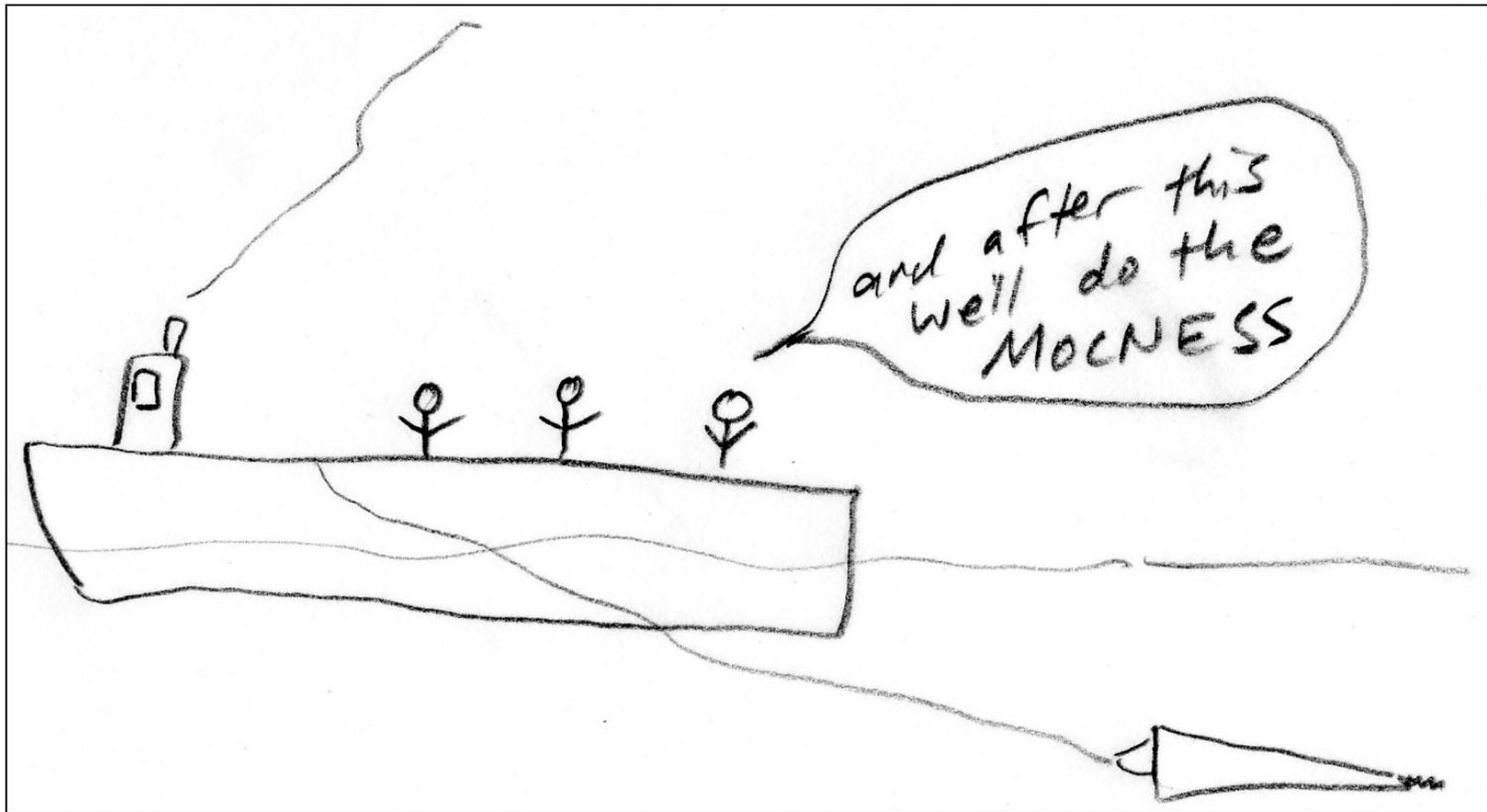
# IERP sampling grid - west



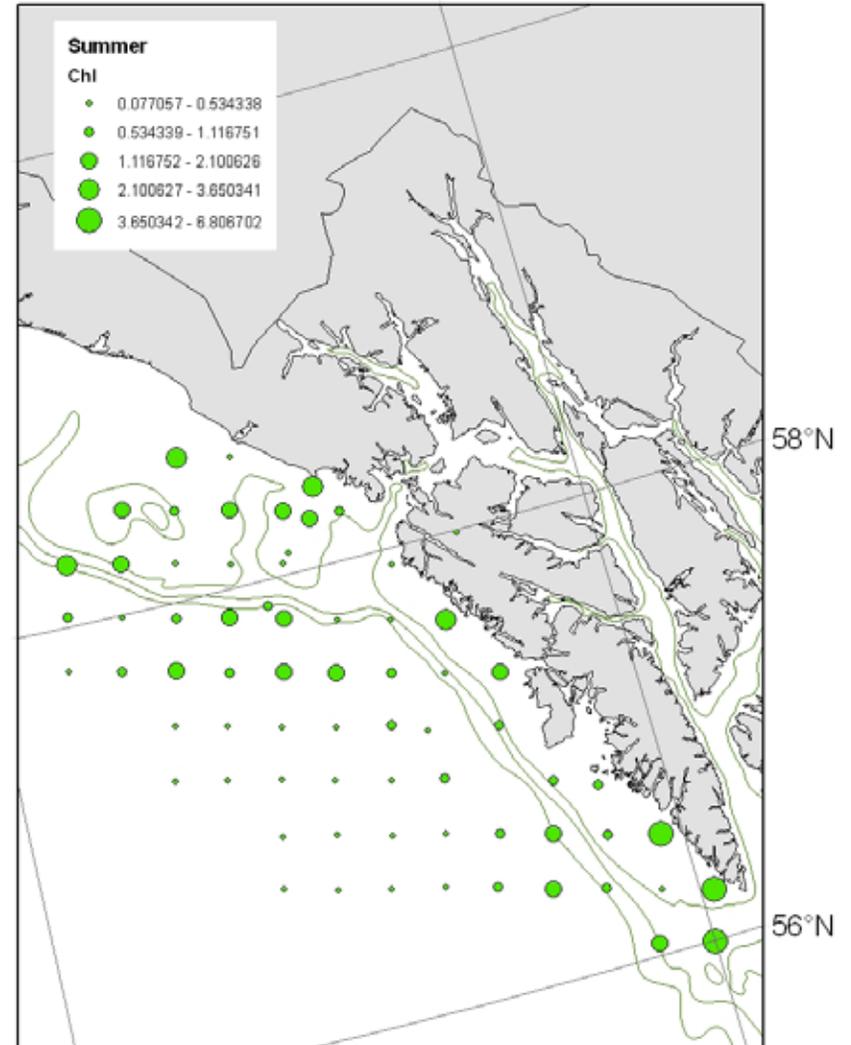
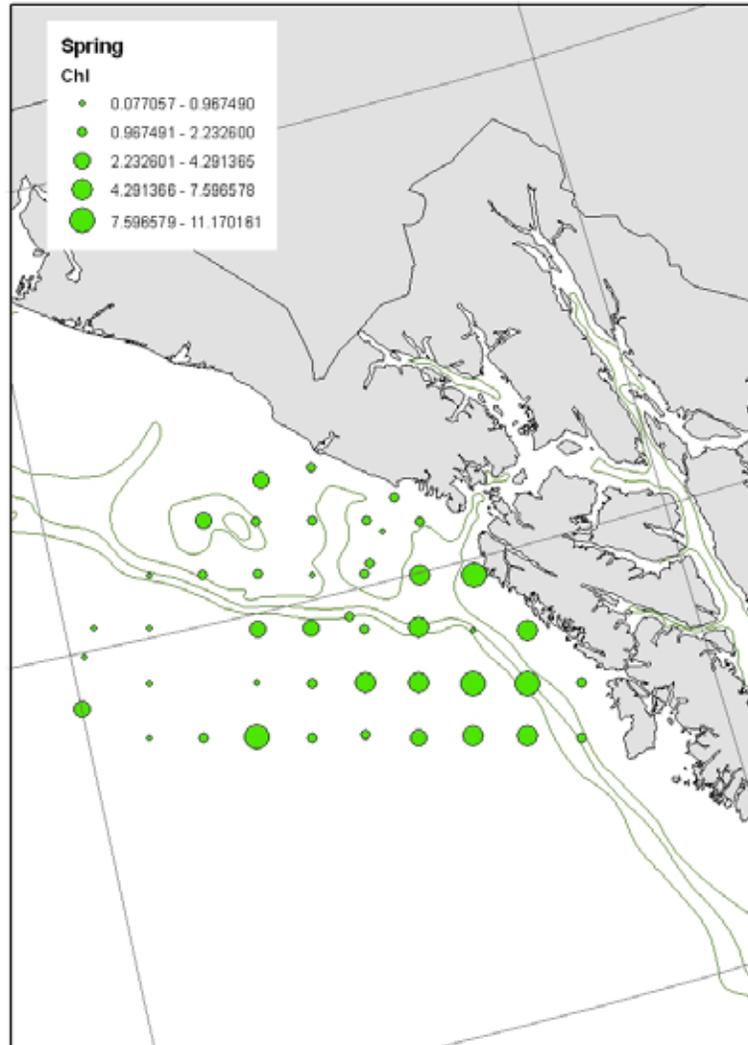
# IERP sampling grid - detail



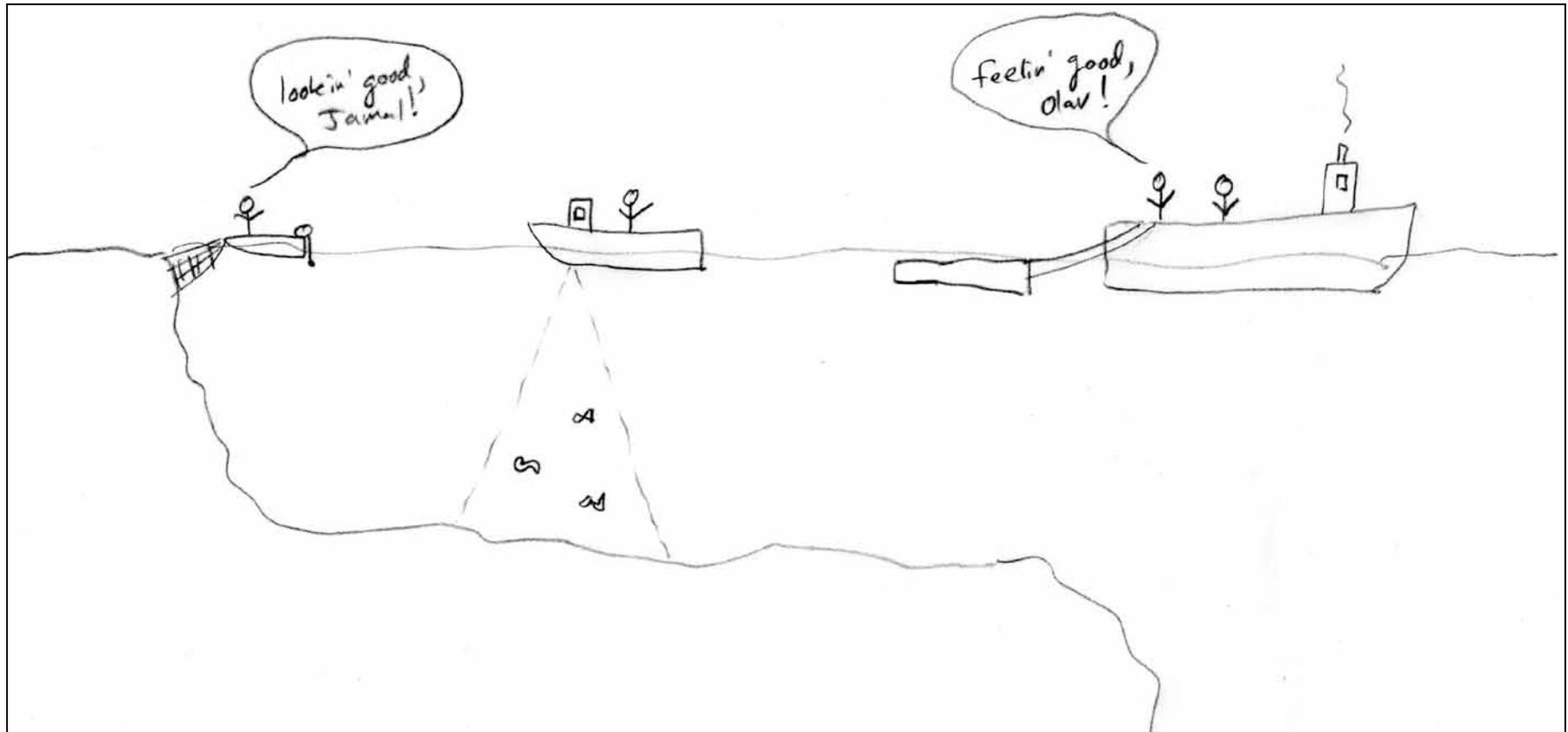
objective #2: determine how physical and biological mechanisms influence primary and secondary productivity throughout the GOA



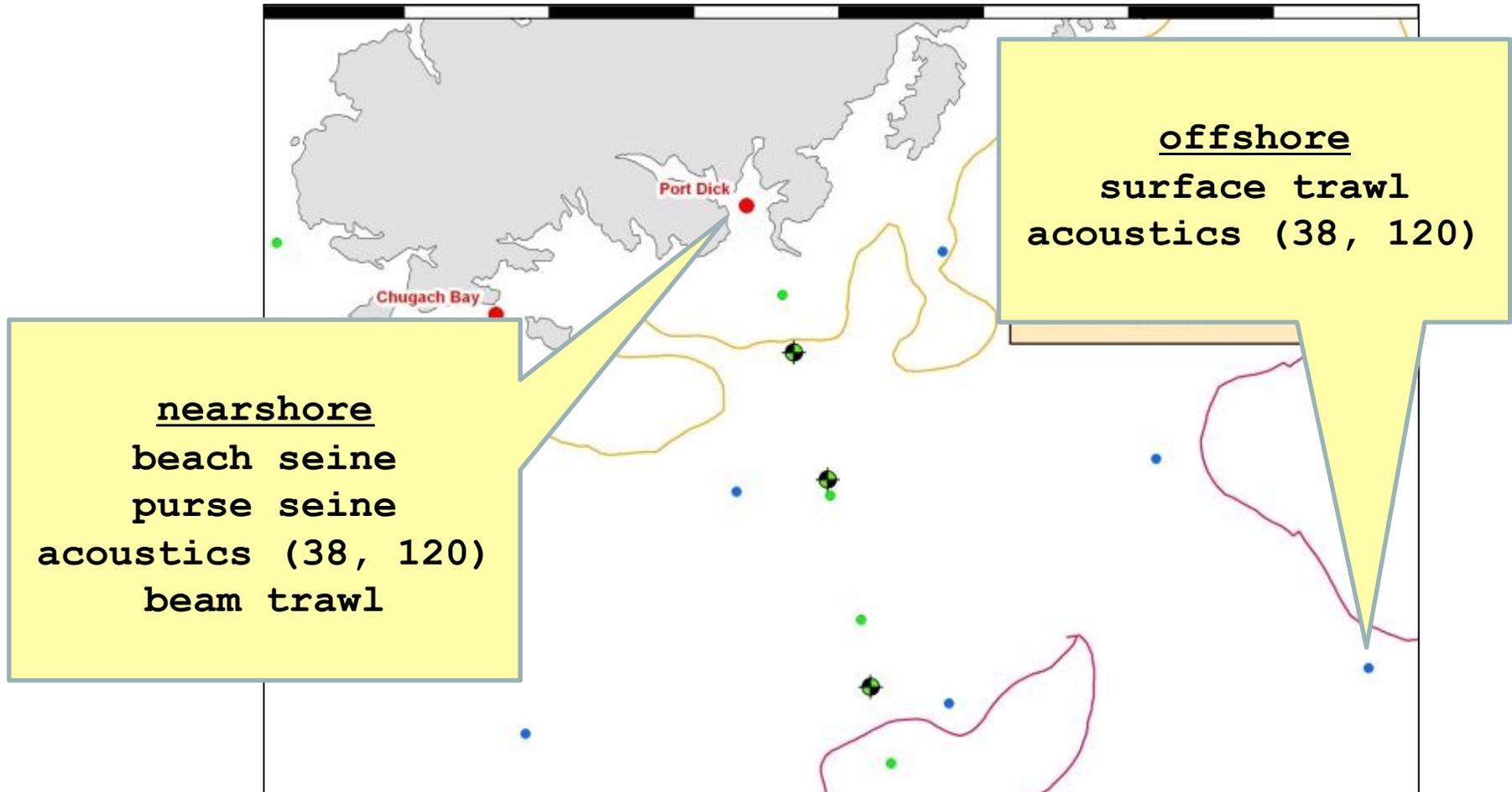
# 1° production example



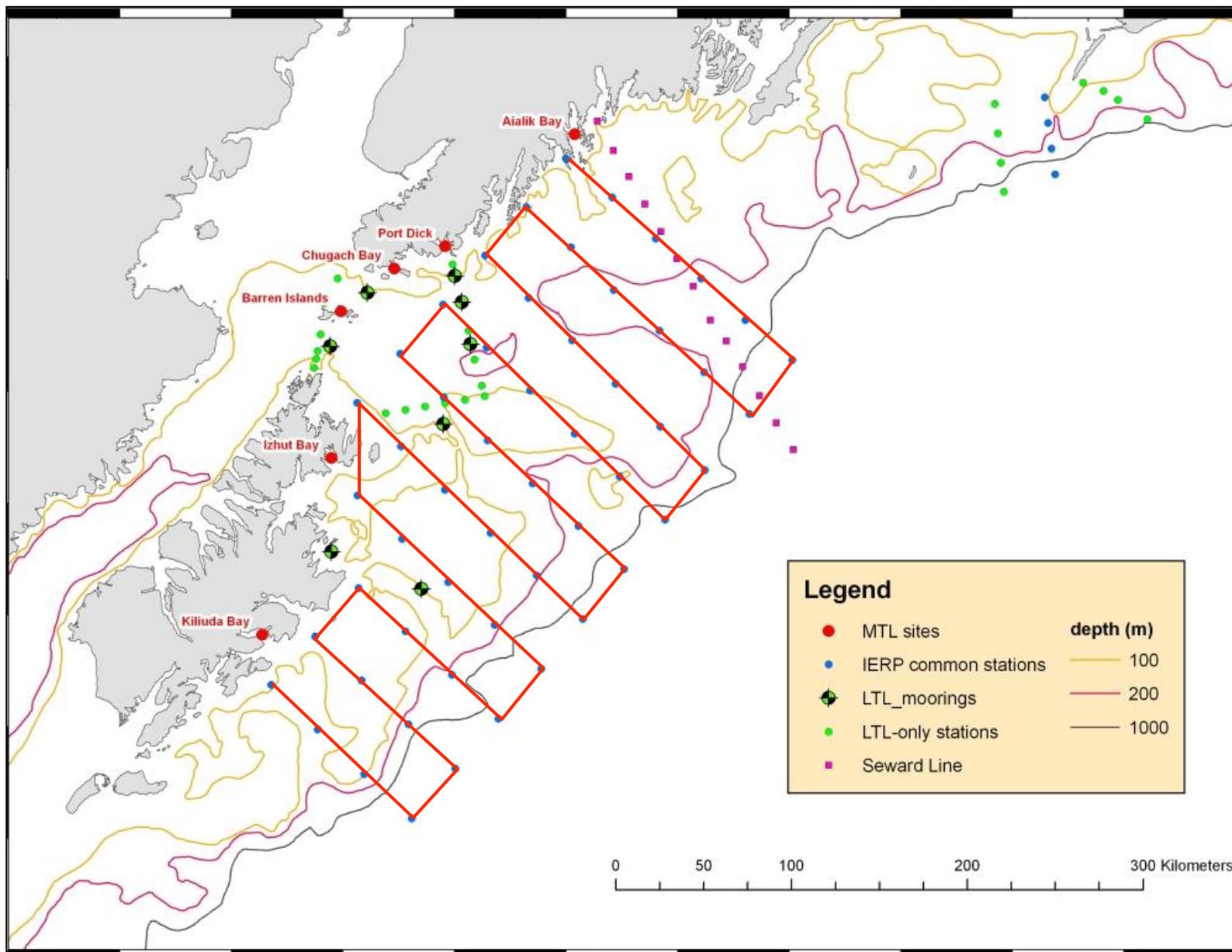
objective #3: provide a synoptic view, from the shoreline out to beyond the shelf-break, of the distribution and abundance of forage fishes and the early life stages of five focal groundfish species



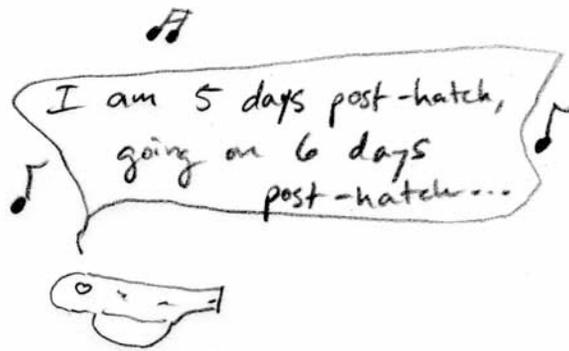
# synoptic view: gears



# continuity



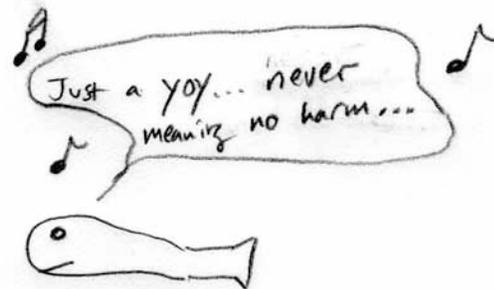
objective #4: use a comparative approach to assess spatial and temporal variability in the ecosystem, primarily between the EGOA and CGOA and among spring, summer, and fall



spring

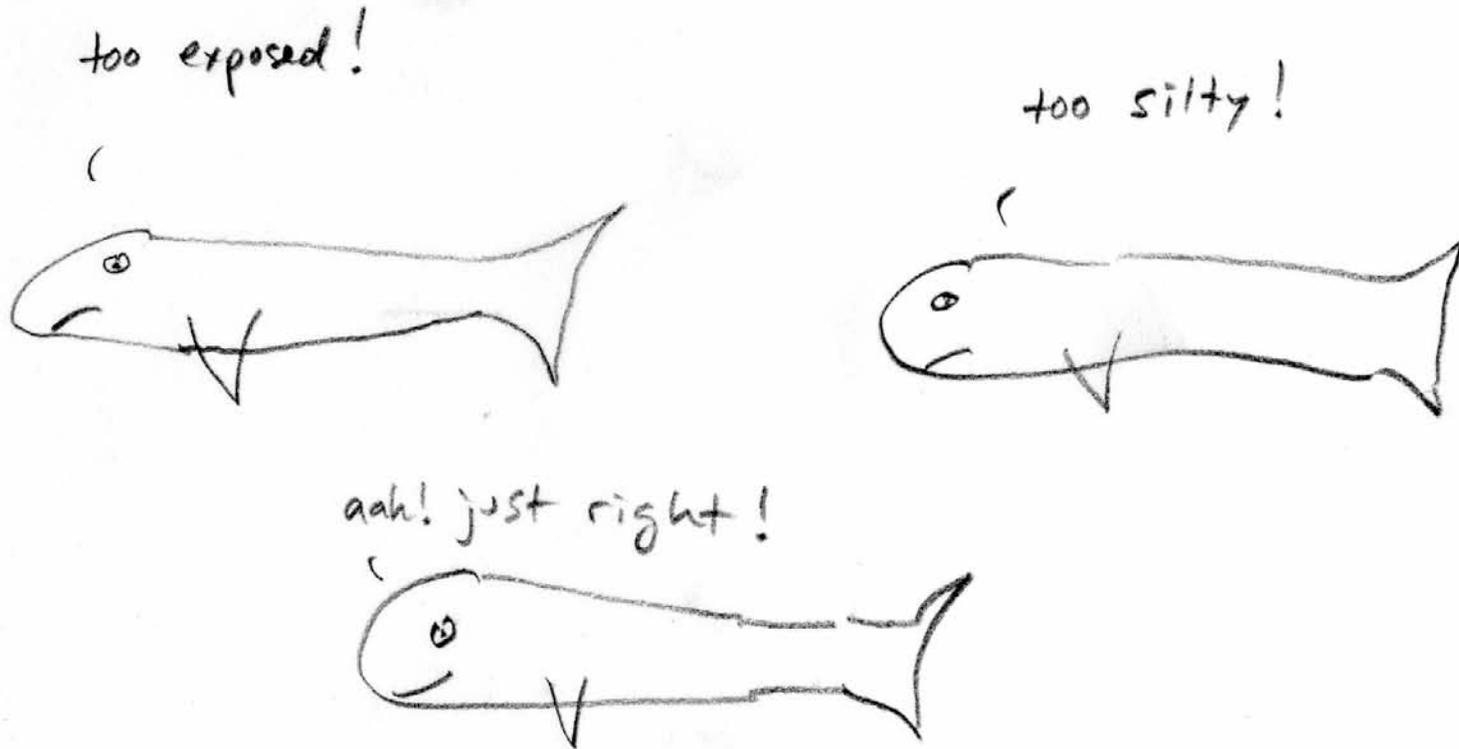


fall

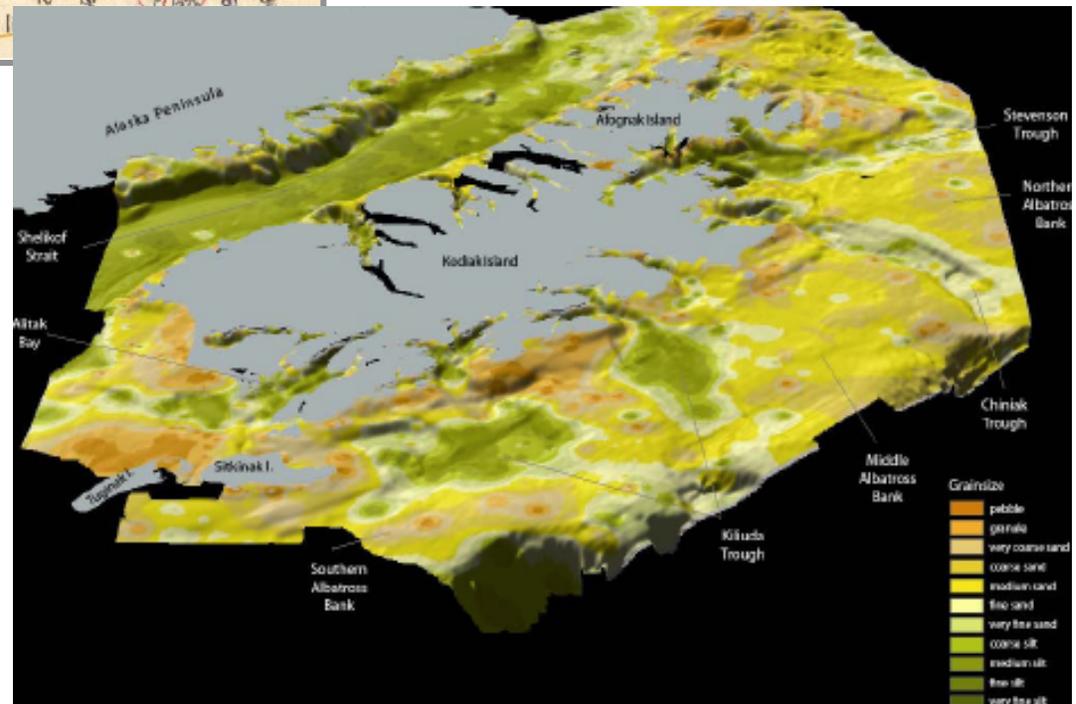
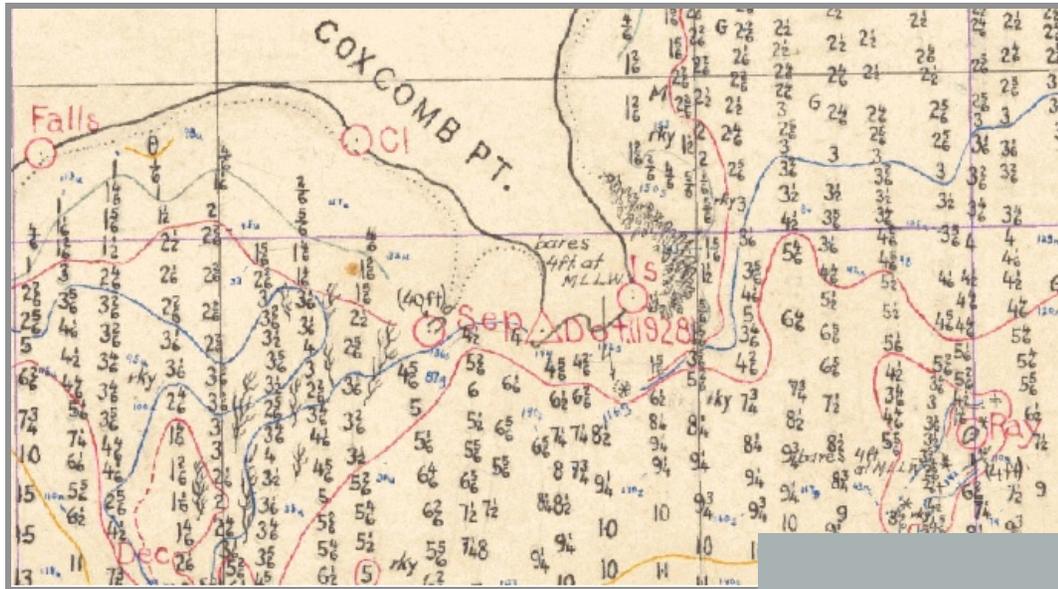


summer

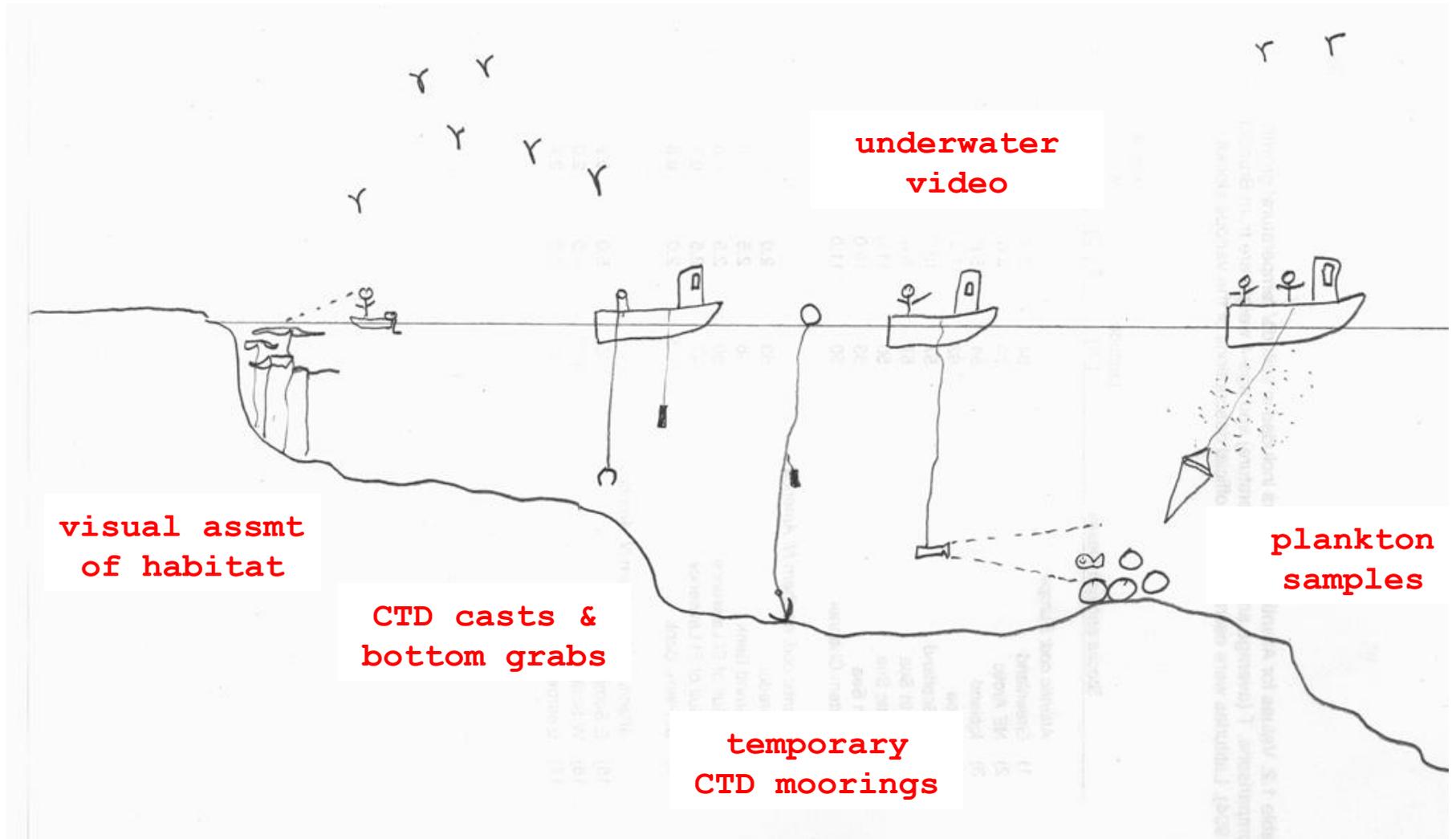
objective #5: analyze habitat associations, create habitat suitability maps, and study the influence of habitat requirements on the spatial overlap among species



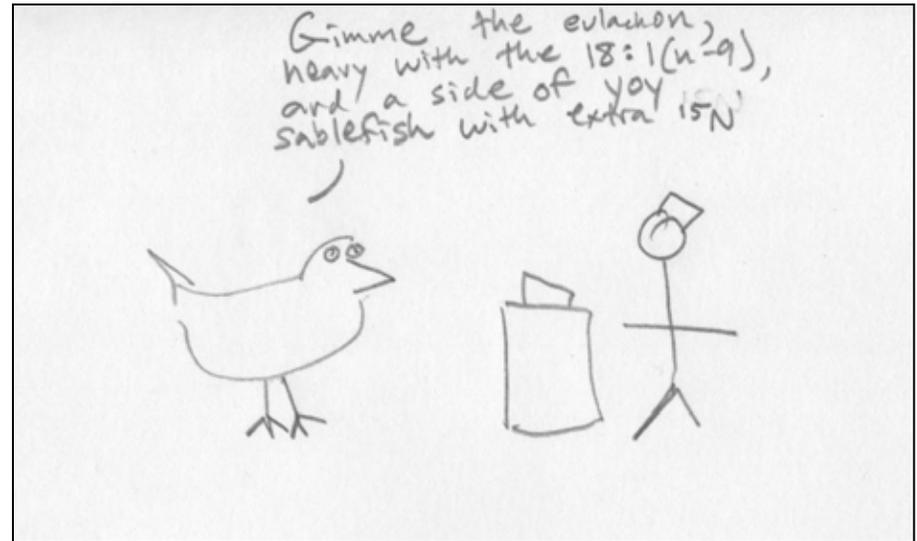
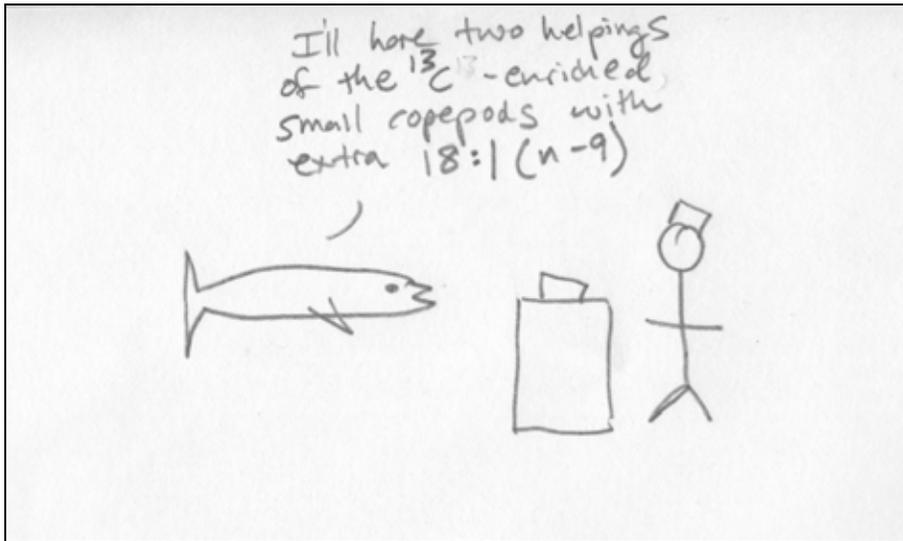
# habitat suitability maps



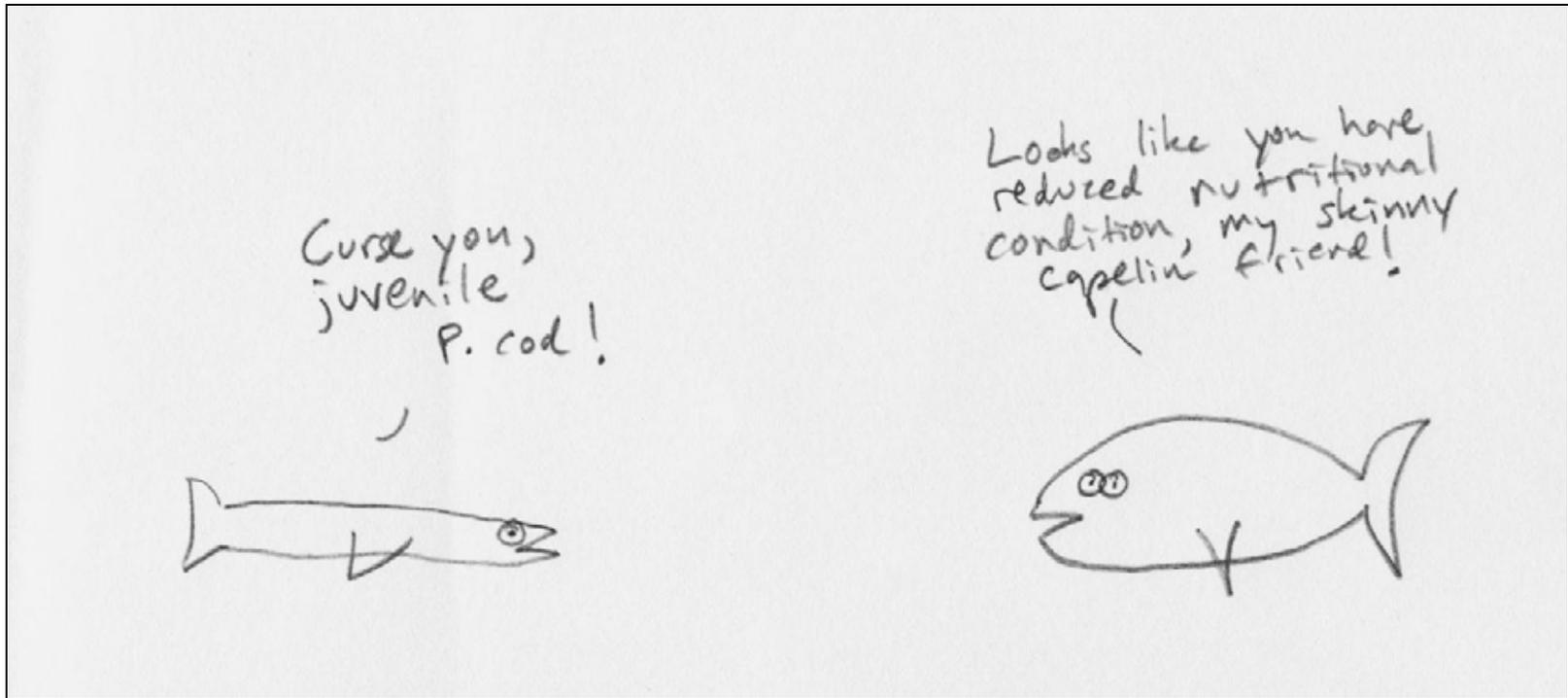
# habitat fieldwork



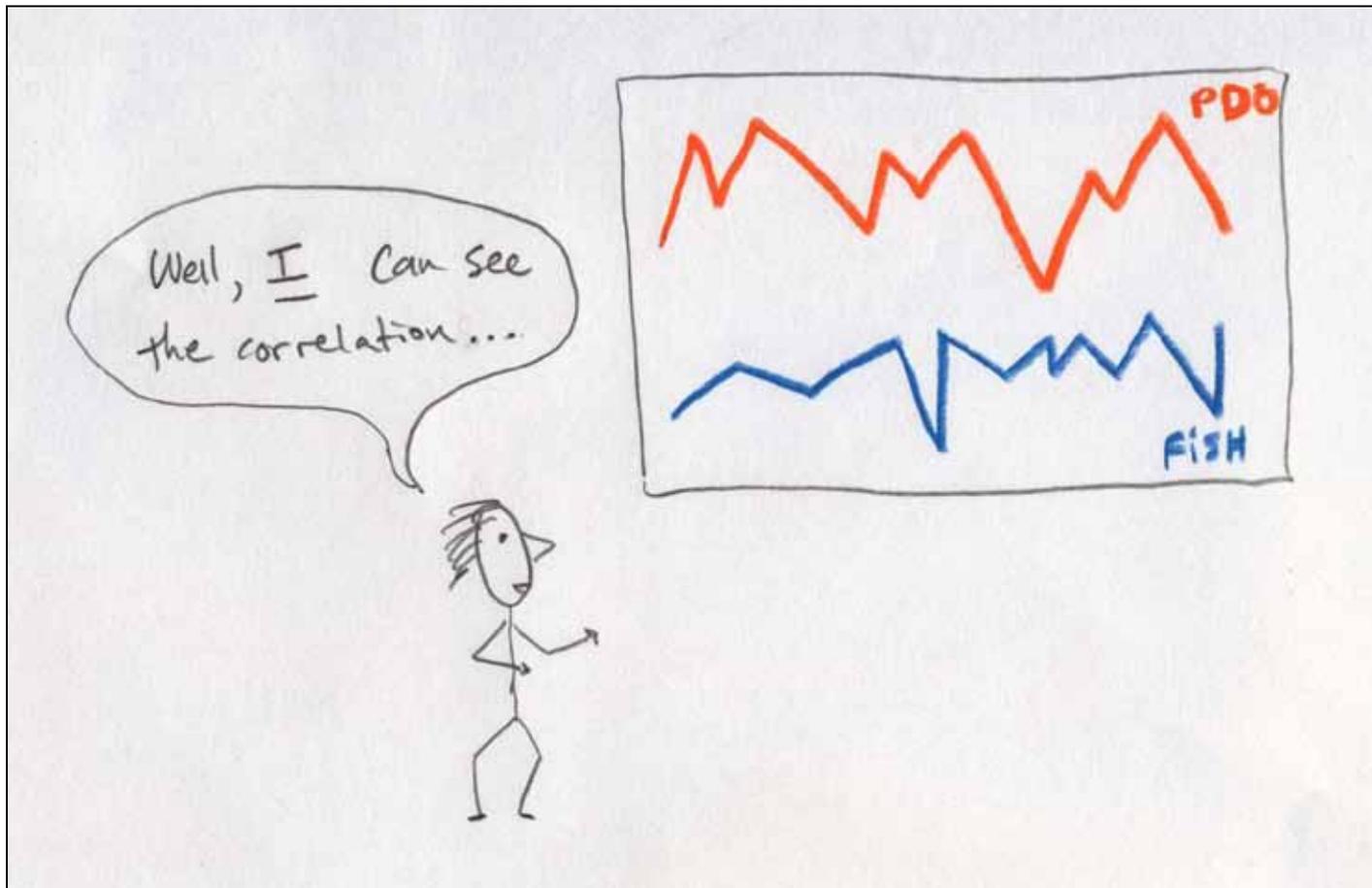
objective #6: use multiple techniques to analyze the diets of species from different trophic levels and use these data to elucidate trophic relationships



objective #7: assess nutritional condition and determine rates of growth and consumption of the focal fish species



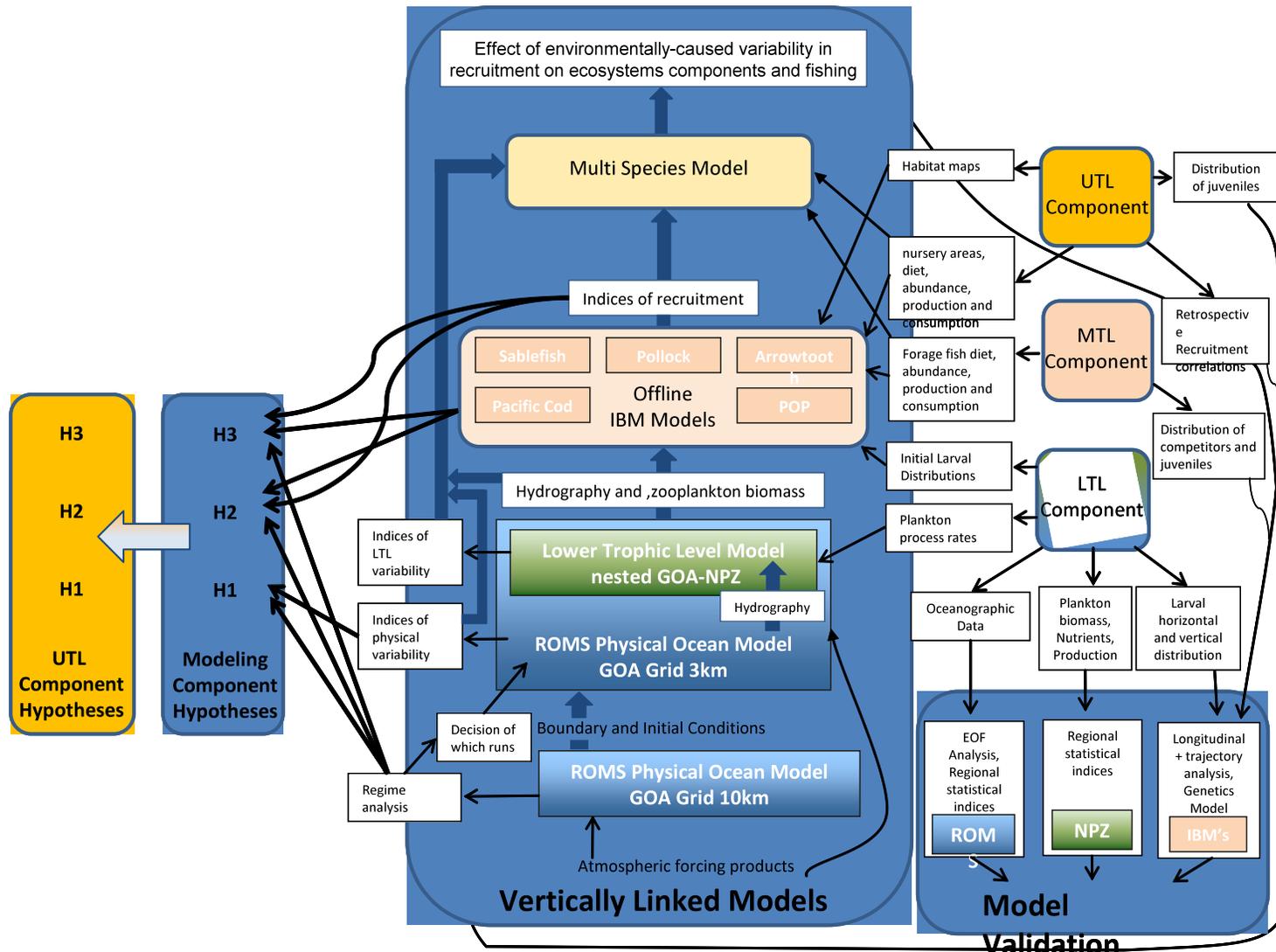
objective #8: use historical datasets to analyze temporal variability in drivers influencing the early life survival of key groundfish species



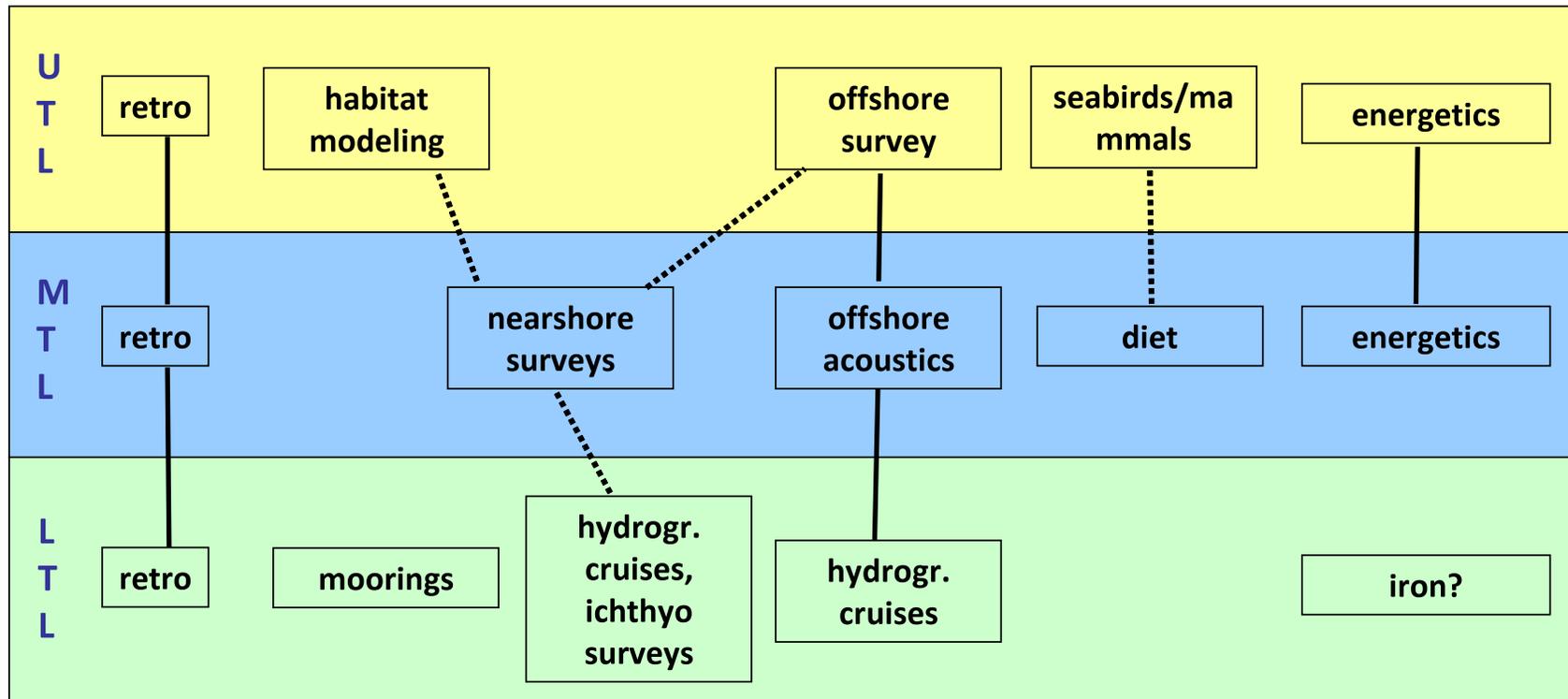
objective #9: build a system of linked models that describe the connections among climate, oceanography, primary and secondary productivity, and the early life survival of the focal fish species



# modeling plan



# research plan (observations)



AFSC acoustic surveys

AFSC bottom trawl surveys

# timeline

year	season	activity
2011	spring	LTL, MTL fieldwork
	summer	all TL fieldwork
	fall	all TL fieldwork
2012		UTL fieldwork; lab analyses
2013	spring	LTL, MTL fieldwork
	summer	all TL fieldwork
	fall	all TL fieldwork
2014		lab analyses finish models & retrospective write-up bask in glory

# questions



JJ Vollenweider photo