

FHL 470

Intro to Historical Ecology

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University of Washington

A timeline of ecology



Observations

Natural history
Anecdotes

Quantitative descriptions



Observations

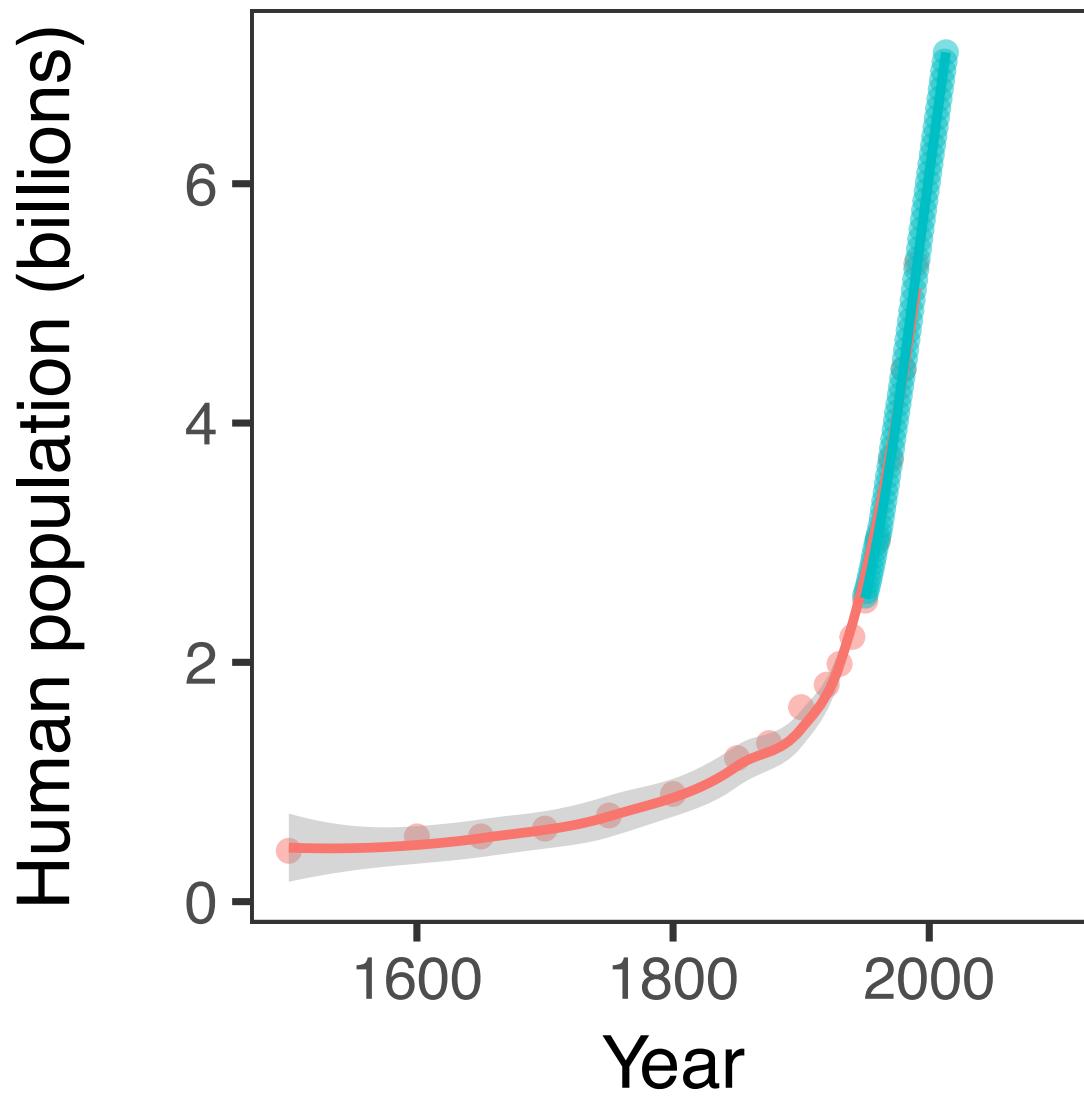
Theory
Frequentist stats
Experiments
Strong inference

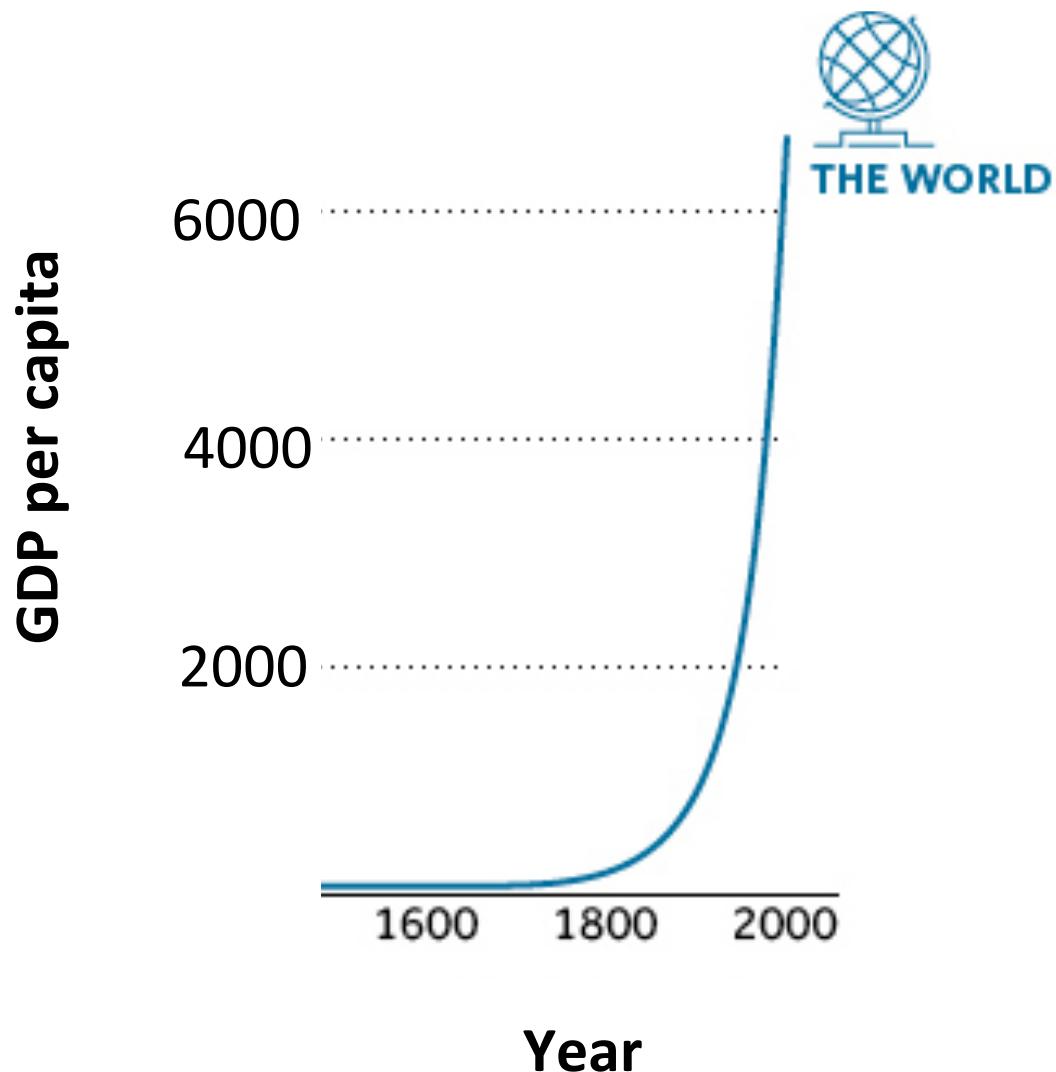


Observations

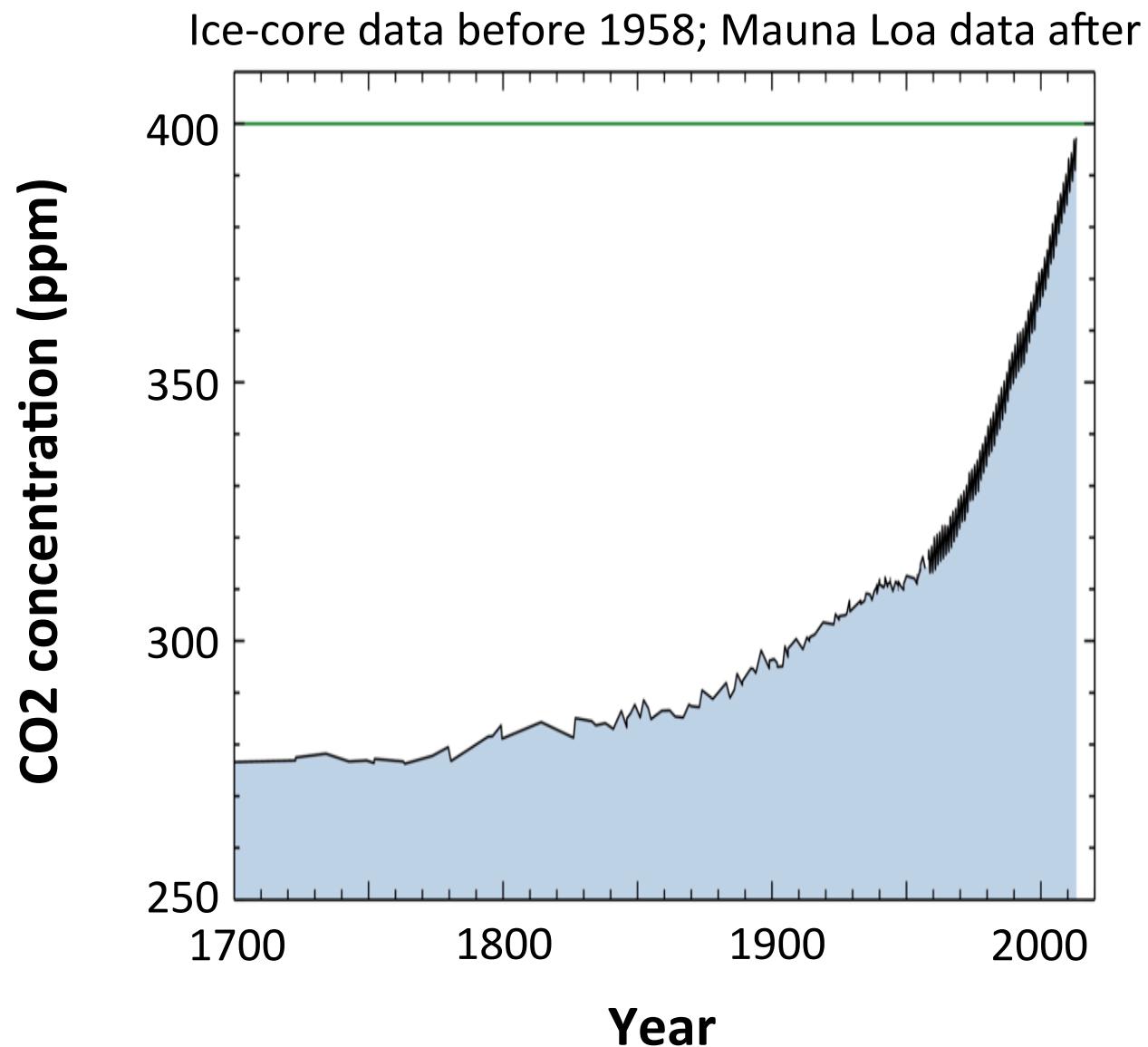
Modern stats
Technology
Computing
Natural history
Passage of time







Data from Angus Maddison
<http://www.visualcapitalist.com/2000-years-economic-history-one-chart>



<https://clas-pages.uncc.edu/mesas/2013/05/06/carbon-dioxide-concentrations-are-nearly-400-ppm/>

What is science?

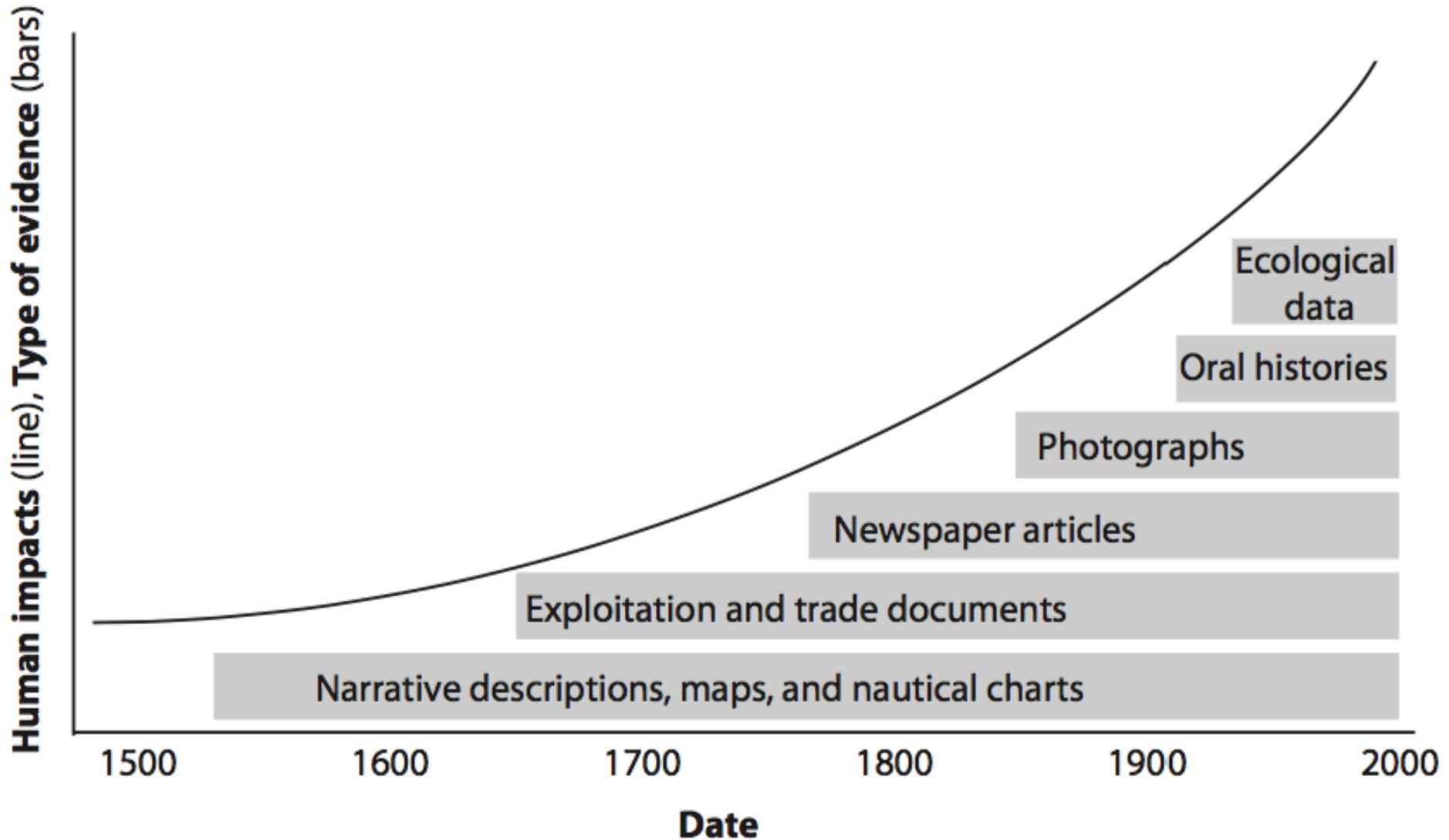
What are the key methods in
the natural sciences?

There are two fundamental ways of doing science: the experimental-predictive and the historical-descriptive. The experimental-predictive approach uses the techniques of controlled experiment, the reduction of natural complexity to a minimal set of general causes, and presupposes that all times can be treated alike and adequately simulated in the laboratory. The historical-descriptive approach uses a mode of analysis which is rooted in the comparative and observational richness of our data, is holistic in its treatment of systems and events, and assumes that the final result being studied is unique, i.e. dependent or contingent upon everything that came before. We suggest that one of the real difficulties we have in understanding ecosystem properties is our inability to deal with scale, and we show how historical science allows us to approach the issue of scale through the interpretation of pattern in time and space.

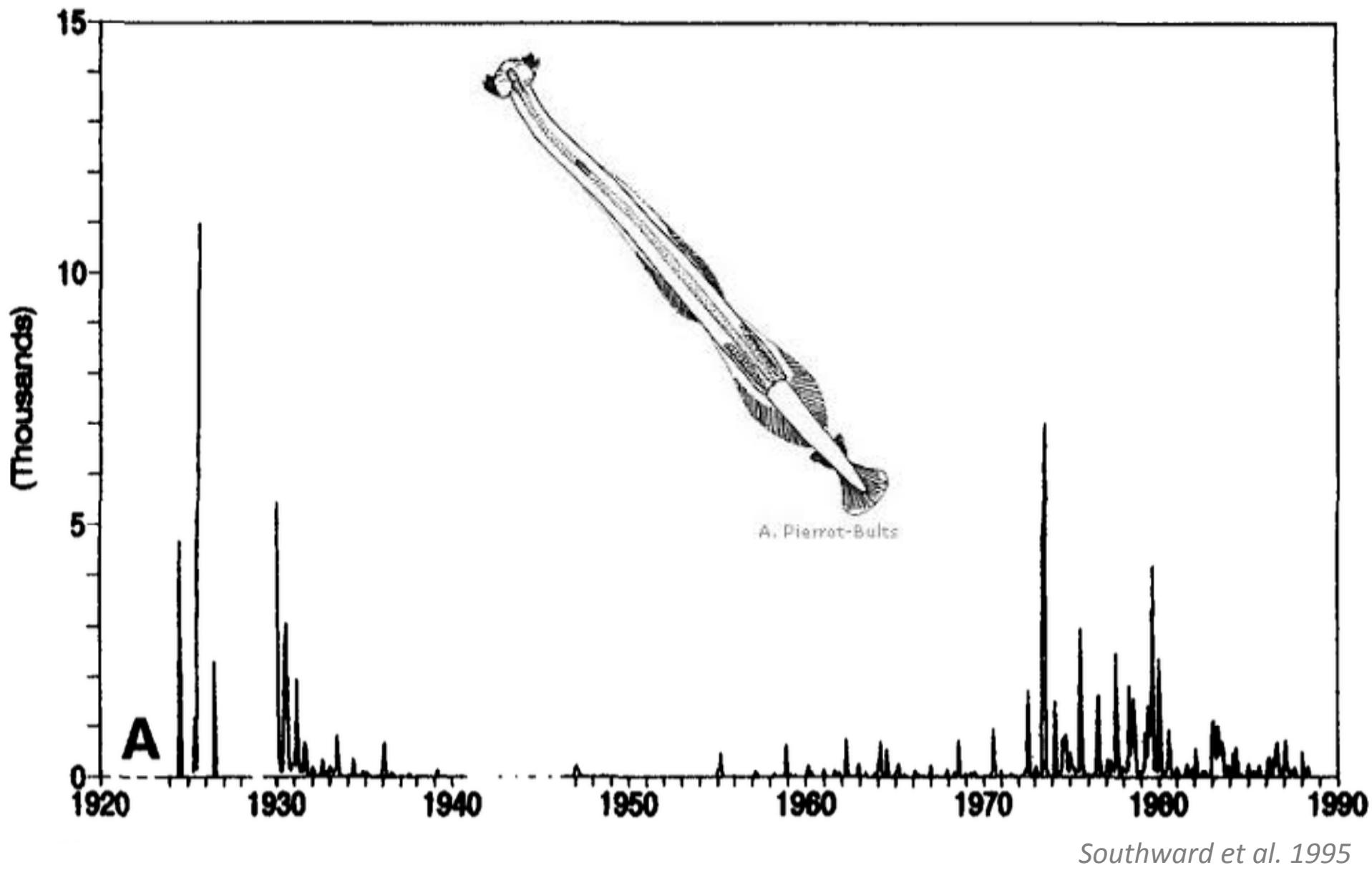
Historical ecology and our course FHL 470

**The unapologetic use of
observations to understand long-
term change in ecosystems**

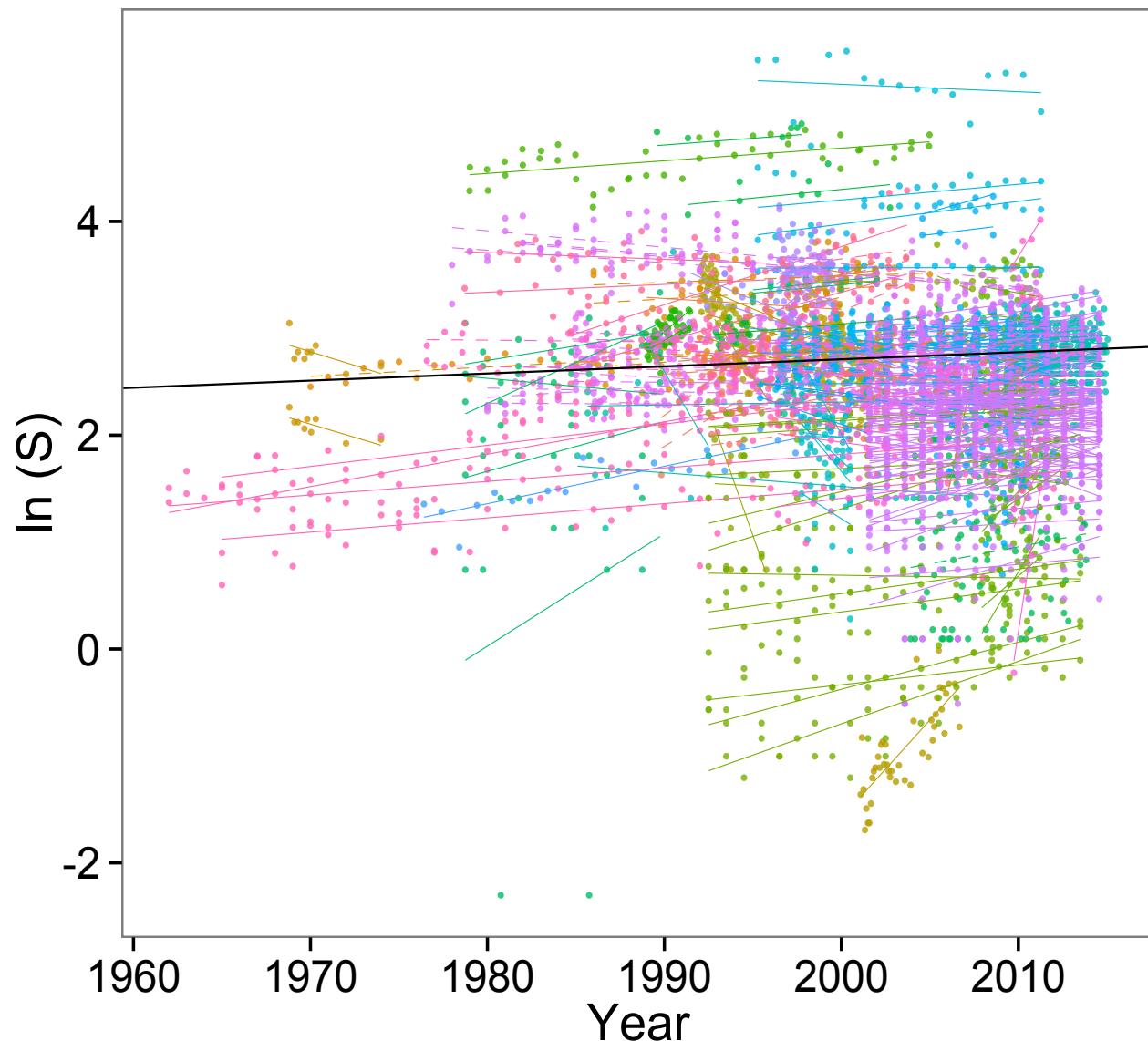
Types of evidence used to identify human impacts



The longest marine ecological time-series?



Most long-term marine ecological time series are not very...long

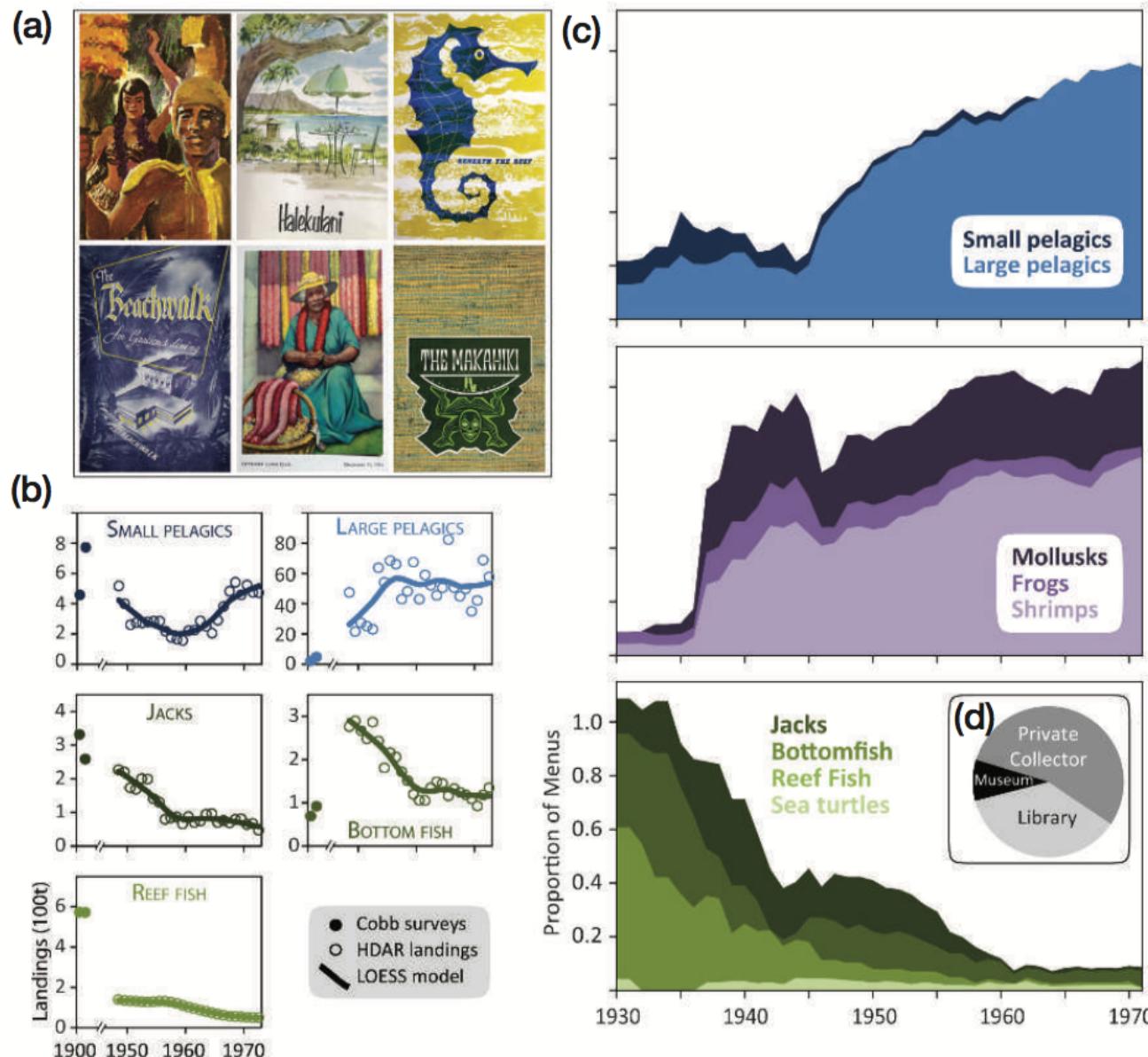


Elahi et al. 2015

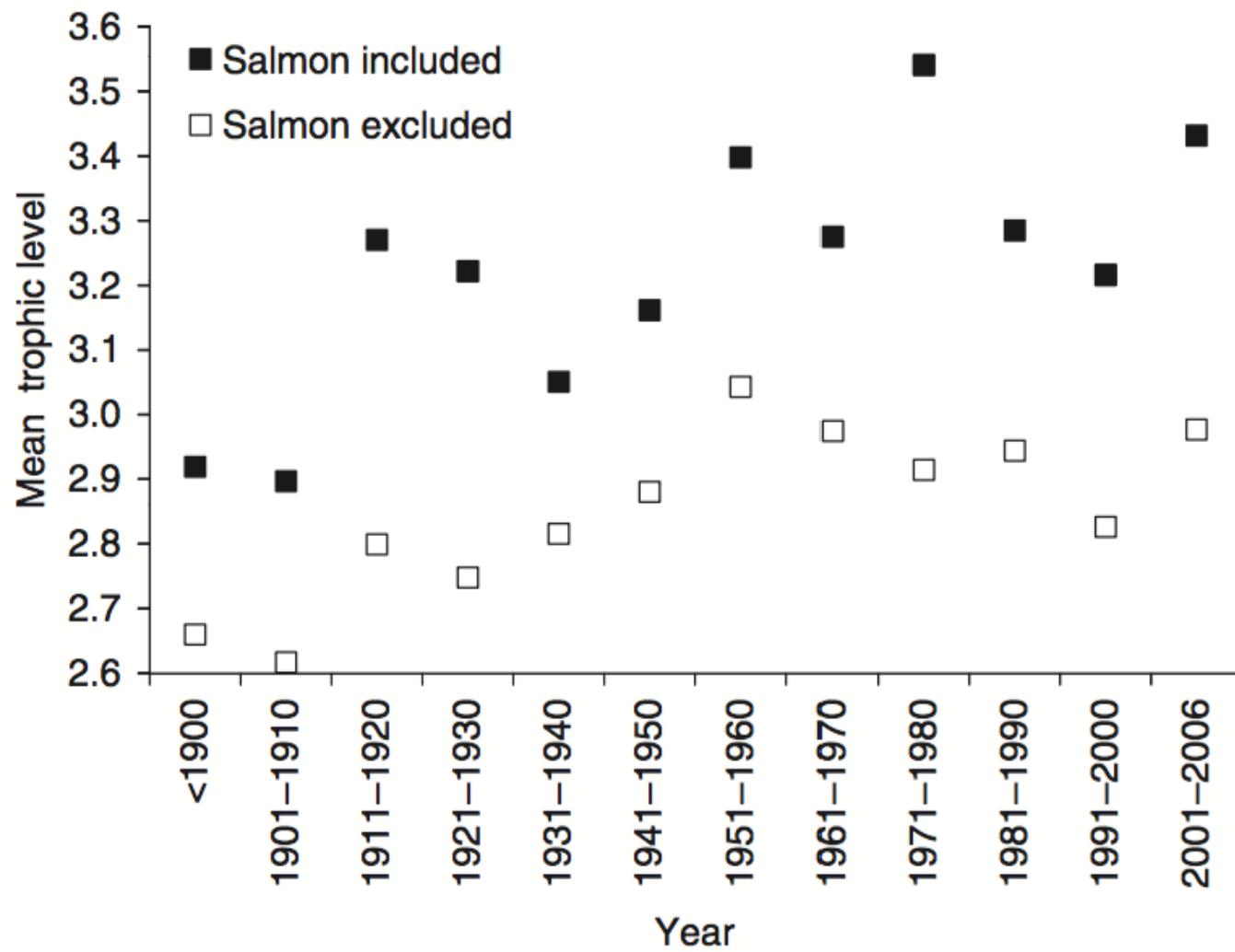
Creative historical approaches yield
critical ecological insights

Tracking human resource use
Setting conservation baselines
Biotic responses to climate change

Tracking human resource use

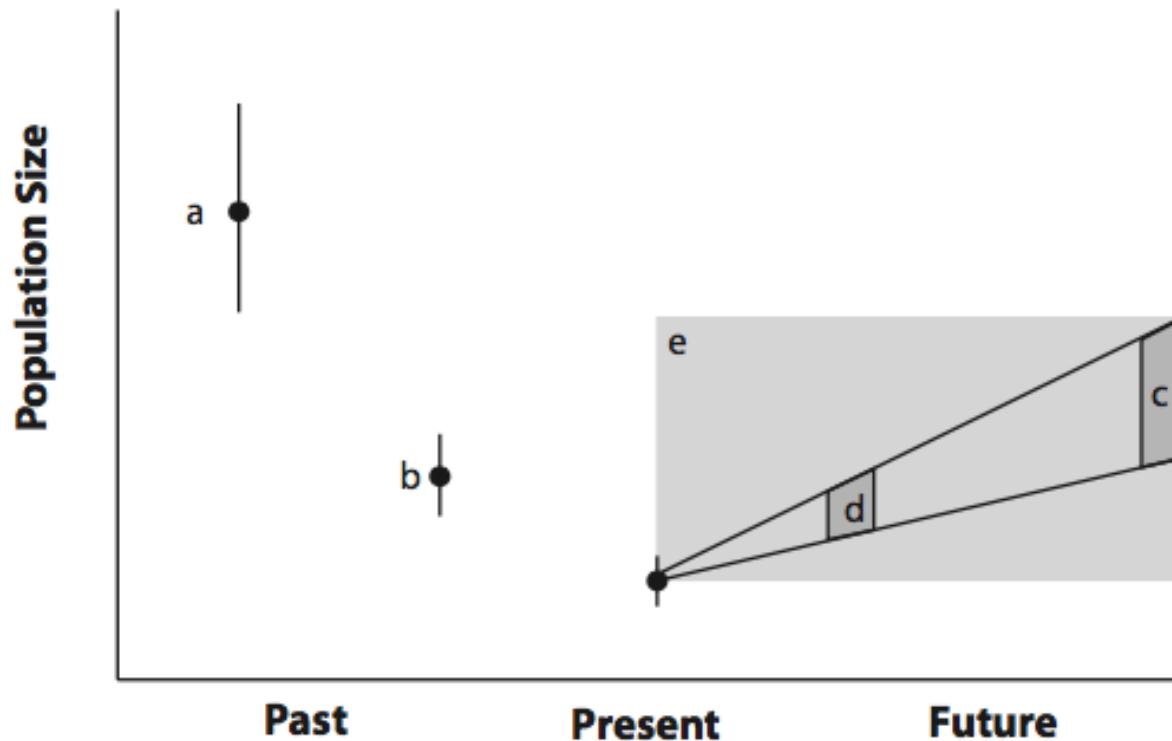


Tracking human resource use



Setting conservation baselines

- a) *Baseline estimate with historical data*
- b) *Baseline estimate with modern data*
- c) *Recovery target range implied by historical data*
- d) *Recovery target range implied by modern data*
- e) *Possible range of recovery due to habitat alteration, ecological changes, etc.*



Setting conservation baselines



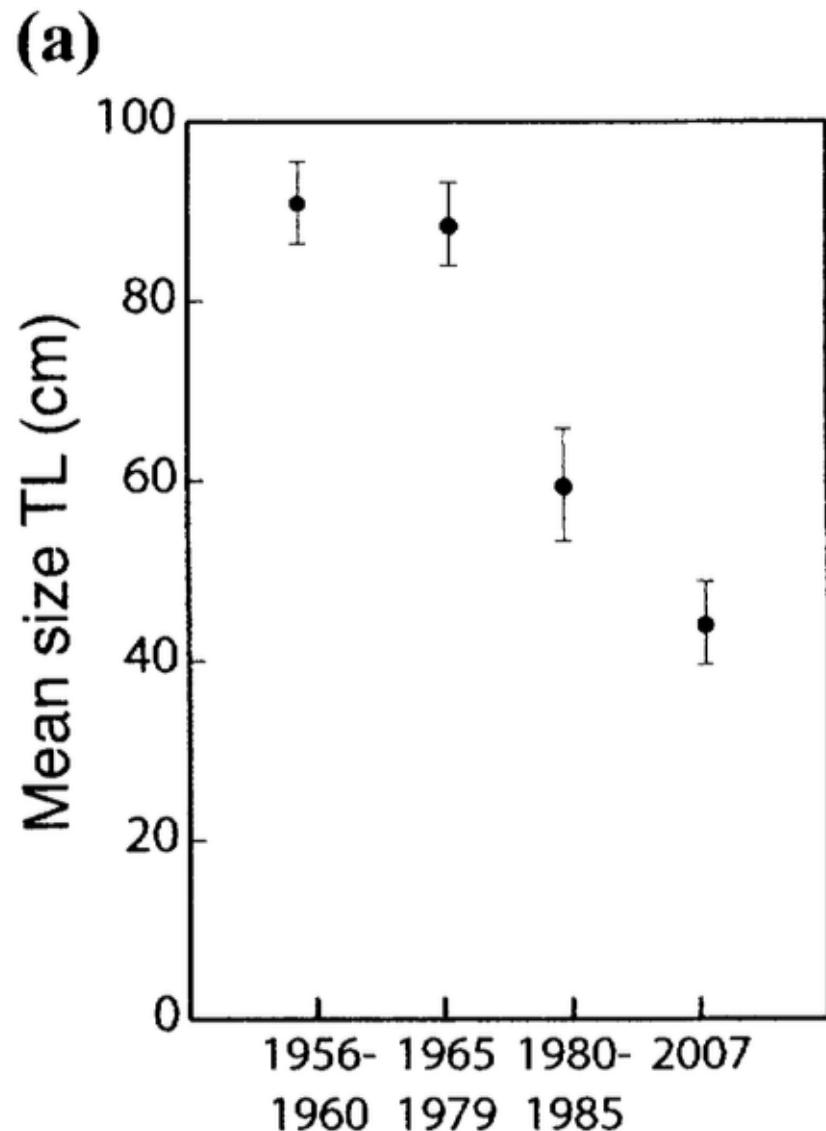
1957



1980



2007

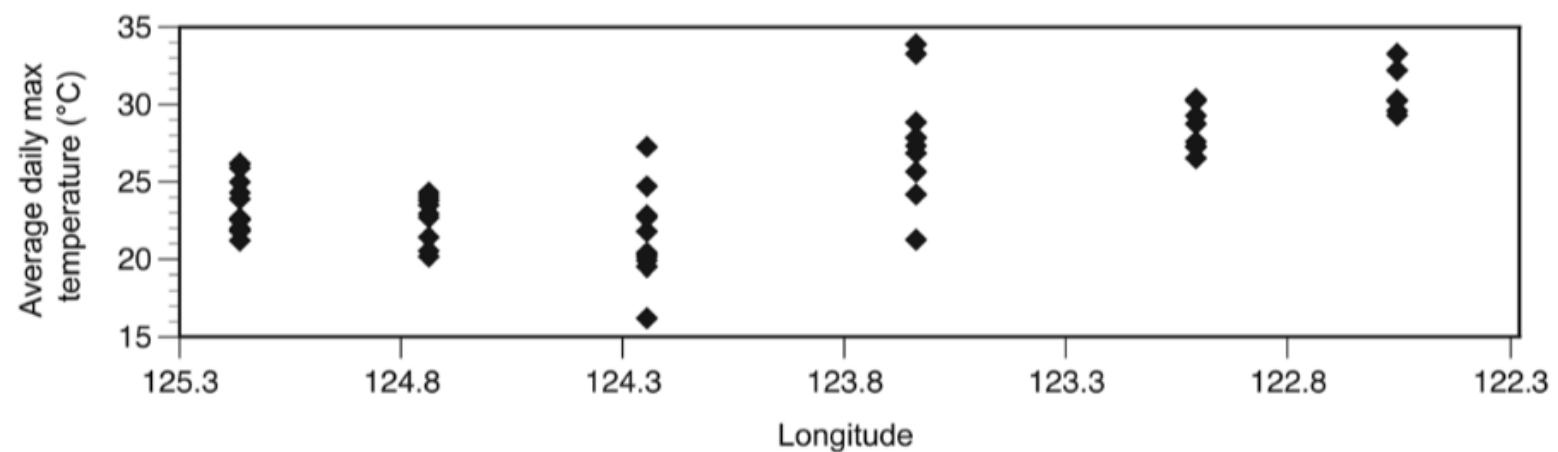
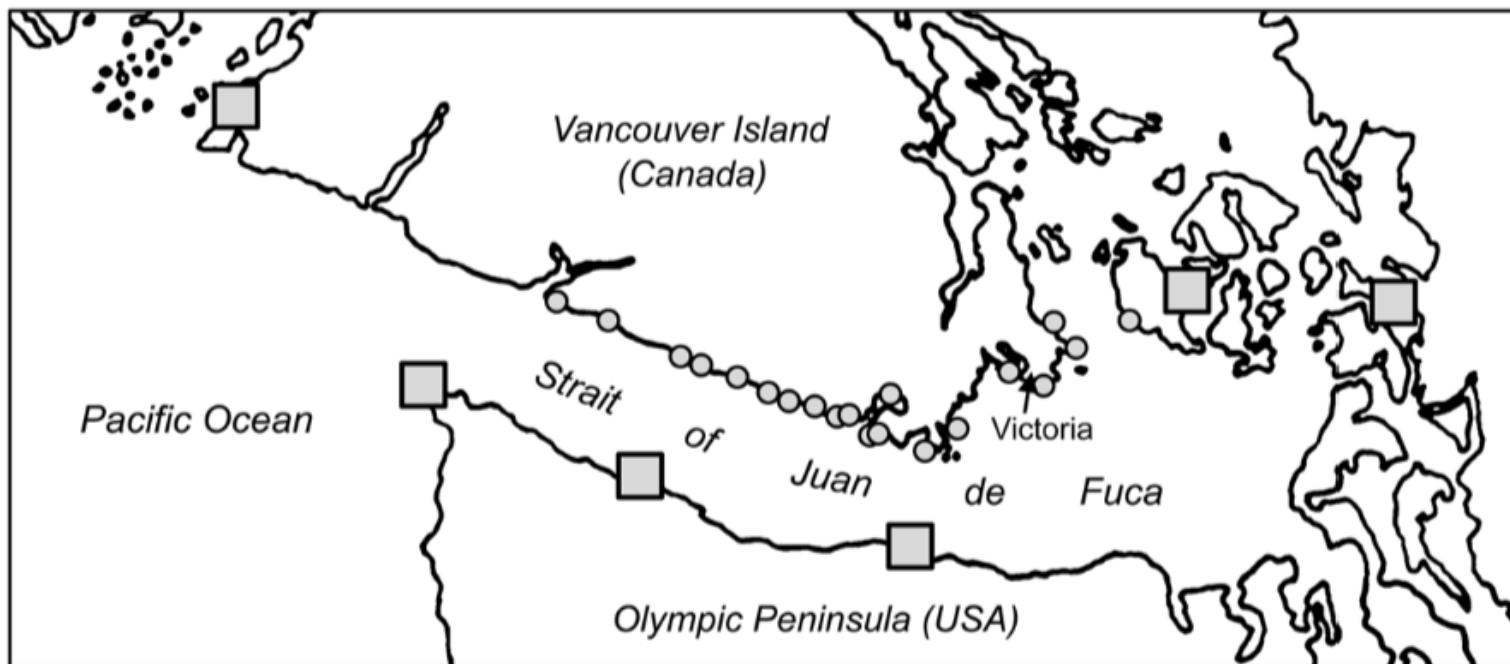


McClenachan et al. 2009

Biotic responses to climate change

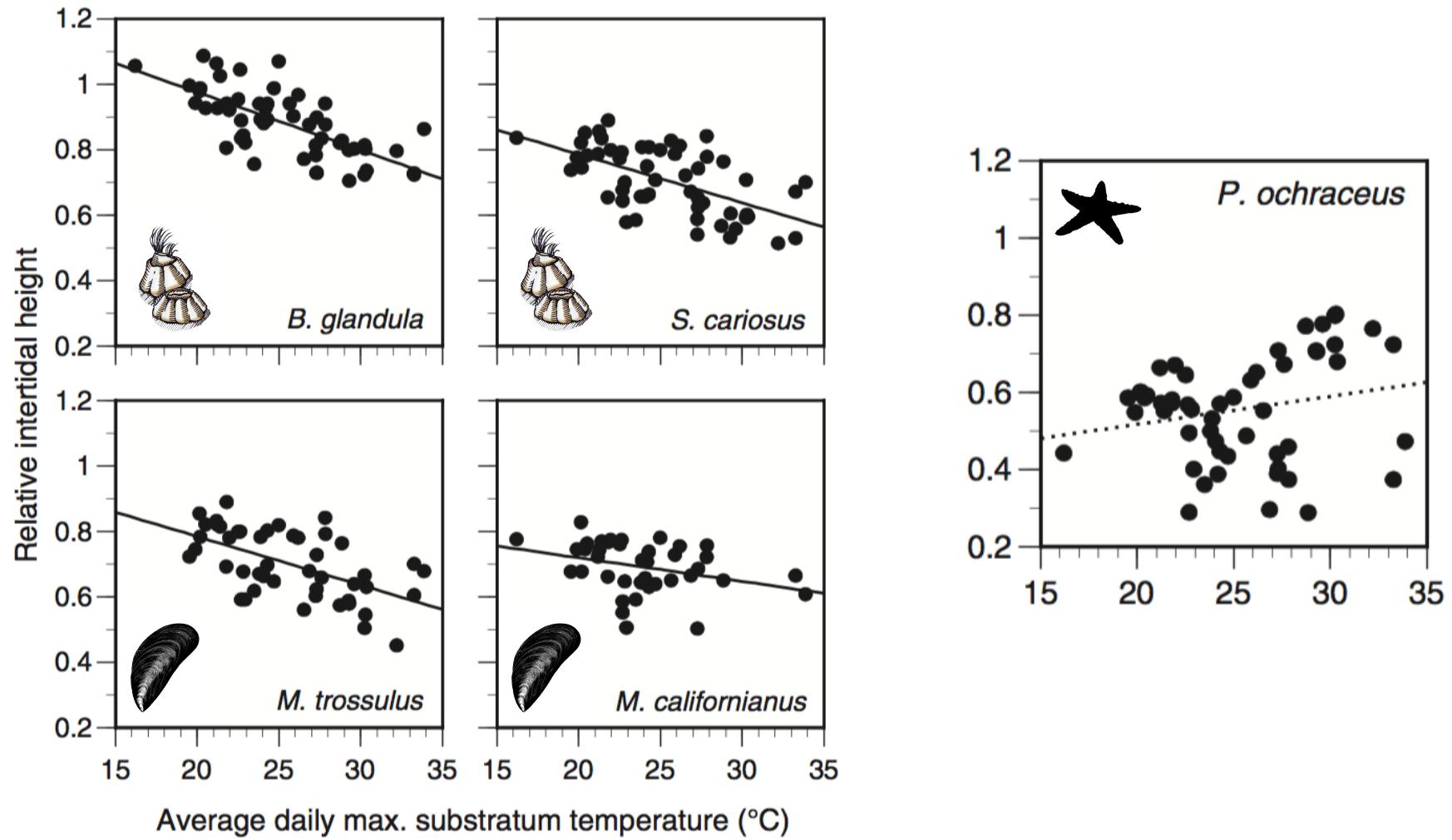


Biotic responses to climate change



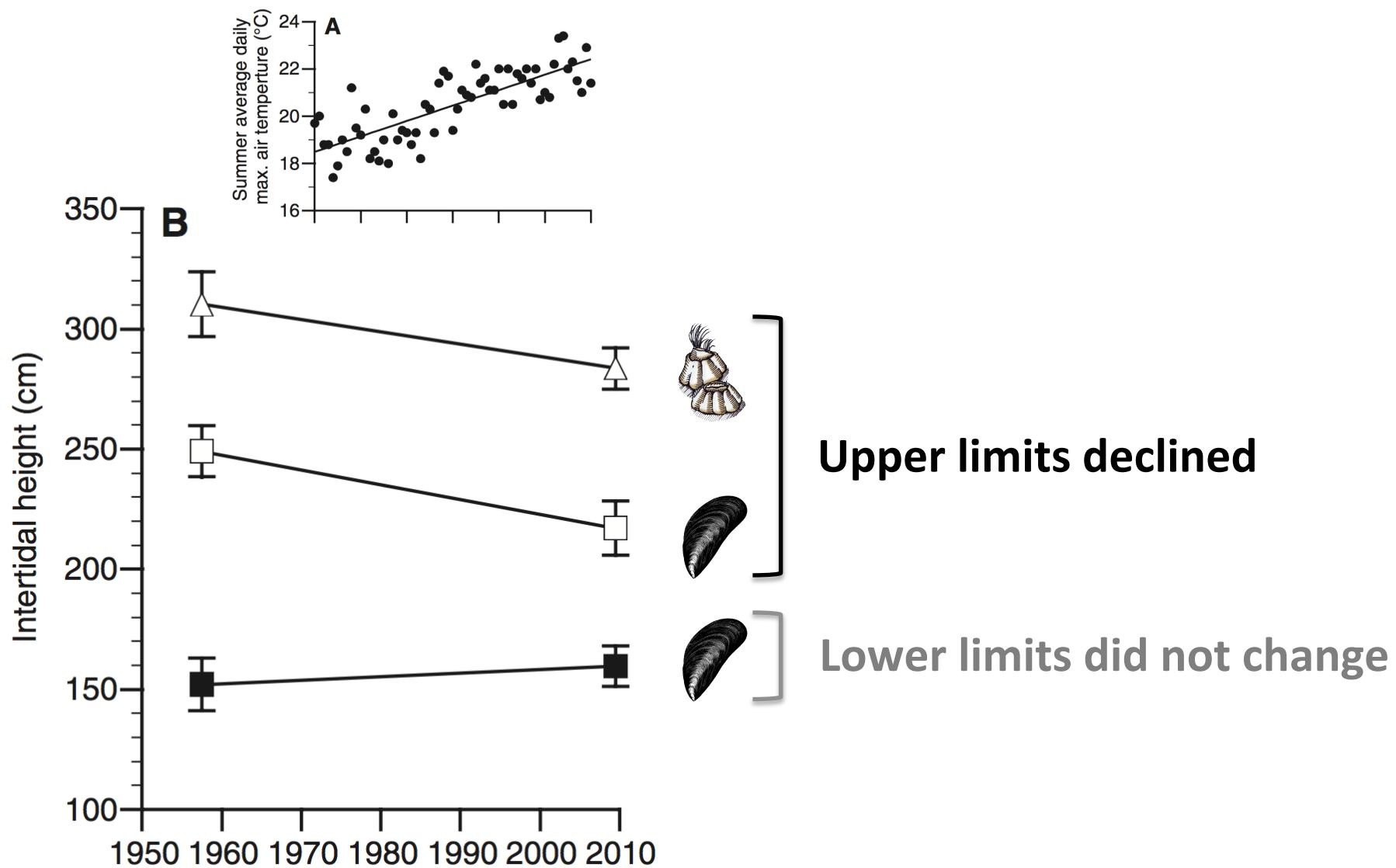
Harley 2011

Biotic responses to climate change



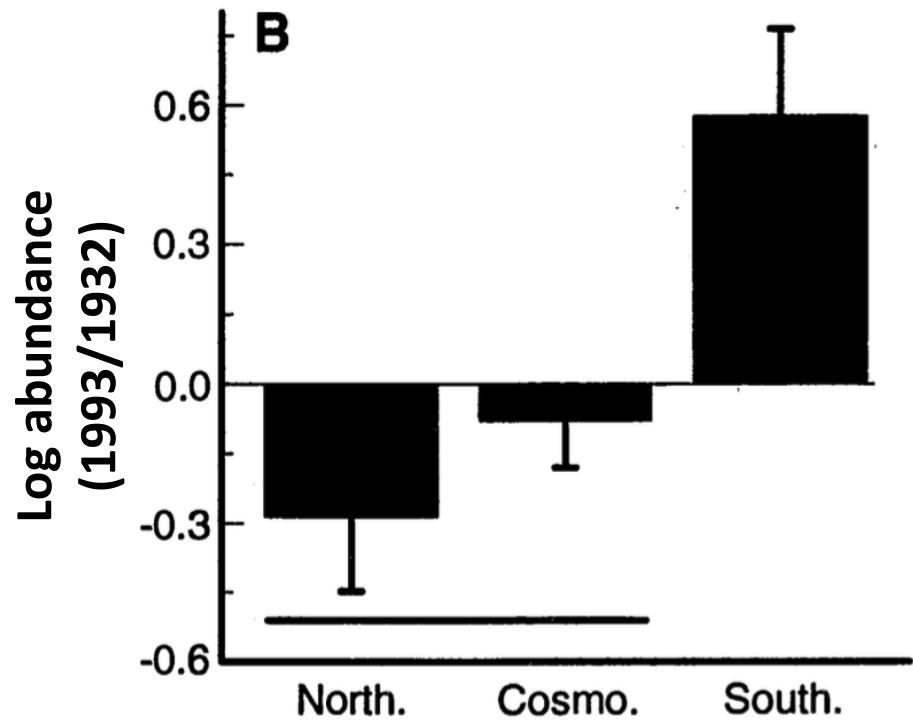
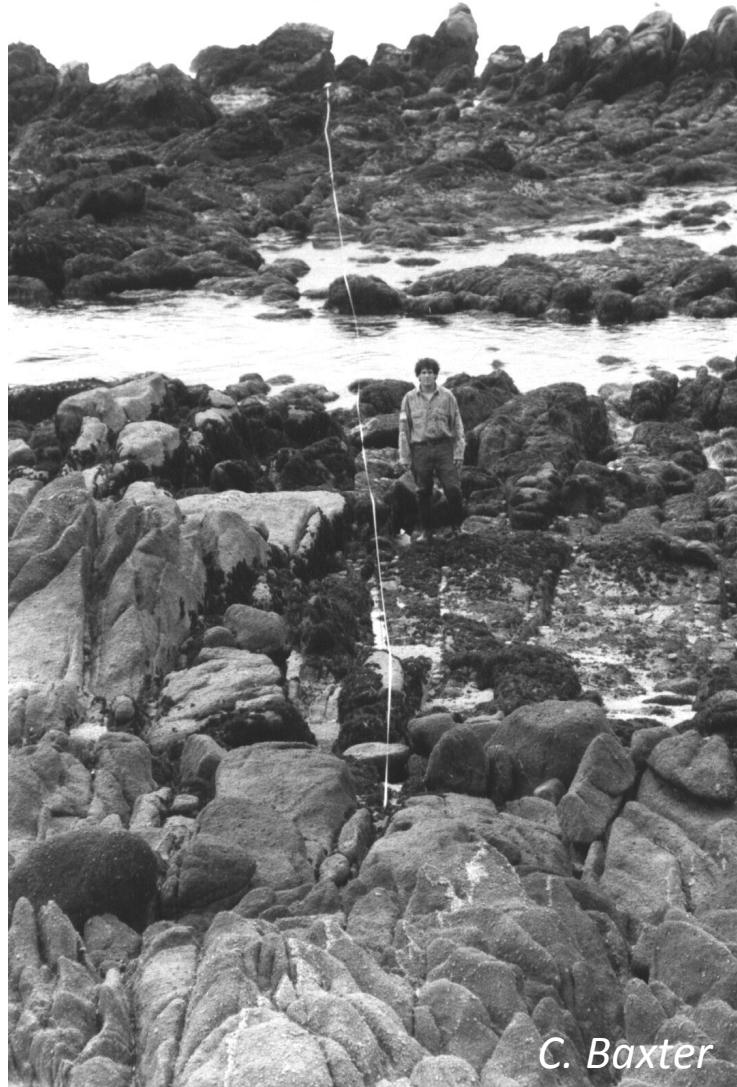
Harley 2011

Biotic responses to climate change



Widdowson 1959; Harley 2011

Biotic responses to climate change



+1°C

Hewatt 1934; Barry et al. 1995; Sagarin et al. 1999

Wanted: student reports for ecological baselines



Activity: perusal of FHL student papers

Friday Harbor Labs Class Papers Database -- Exported 1/23/2018

Author	Title	Class Number	Class Name	Quarter	Year	Descriptors	Location
Bee, James William	A preliminary report of the ecology of False Bay	Zoology 533	Advanced Invertebrate Zoology	Summer	1949	Macoma; Transennella tantilla; Rochefortia tumida	False Bay, San Juan Island
Comita, Gabriel W.	Copepod commensals of pelecypods	Zoology 533	Advanced Invertebrate Zoology	Summer	1949	Paranthessius; Schizothaerus; Herrmannella finmarchica	
Comita, Gabriel W.	A list of the common molluscs collected during the Summer session of 1949	Zoology 533	Advanced Invertebrate Zoology	Summer	1949		
Dunn, Margaret E.	Parasitic Cirripedia and Isopoda infesting shrimp collected in the vicinity of San Juan Island	Zoology 225	Advanced Invertebrate Zoology	Summer	1949	Mycetomorpha; Sylon; Spirontocaris moseri	San Juan Island
Oldenborg, Elizabeth A	Some errant polychaetes of Friday Harbor area	Zoology 225	Advanced Invertebrate Zoology	Summer	1949		Friday Harbor
Oldenborg, Elizabeth	Studies in regeneration in polychaete worms	Zoology 225	Advanced Invertebrate Zoology	Summer	1949	Eudistylia polymorpha; Serpula vermicularis	
Annan, Murvel E.	A study of the fauna of Jones' Beach	Zoology 533	Advanced Invertebrate Zoology	Summer	1950	Macoma; Prototaca staminea	Jones' Beach, San Juan Island
Arny, Samuel A.	Some notes on the movements of two species of littorine snails, <i>Littorina sitchana</i> and <i>Littorina scutulata</i>	Zoology 533	Advanced Invertebrate Zoology	Summer	1950	Littorina sitkana; Littorina scutulata	
Barkas, Earl H.	Intertidal pelecypods of Argyle Lagoon and adjacent beaches	Zoology 533	Advanced Invertebrate Zoology	Summer	1950	Upogebia; Bankia; Rochefortia	Argyle Lagoon, San Juan Island
Bell, G. Mary	Some Phoronida of Puget Sound	Zoology 533	Advanced Invertebrate Zoology	Summer	1950	Phoronis; Phoronopsis	Puget Sound
Hickok, John F.	A study of the commensal relationship of the polychaete <i>Halosydna brevisetosa</i> Kinberg and its host <i>Amphitrite robusta</i> Johnson	Zoology 233	Advanced Invertebrate Zoology	Summer	1950	Halosydna brevisetosa; Amphitrite robusta; Eupolynnia	

<https://github.com/elahi/fhl470/tree/master/databases>

Activity: perusal of FHL student papers

Group 1: 1949-1961

Group 2: 1962-1965

Group 3: 1966-1968

first_name	group_number
Sean	2
Jamie	1
Elena	3
Chloe	2
Henry	2
Jessica	1
Kia	1
Cormac	3
Lauren	3

- Score (1 = yes, 0 = no) each paper for:
 - Ecological
 - Intertidal
 - Invert
 - Algae
 - Repeatable (if unsure, use 0.5)

https://docs.google.com/spreadsheets/d/1lOif3vwpl_O36U-nIA65Tcs3coGV7h8F3s21v_WHW78/edit?usp=sharing