

Aquatic invasive species (AIS) in a warming lake


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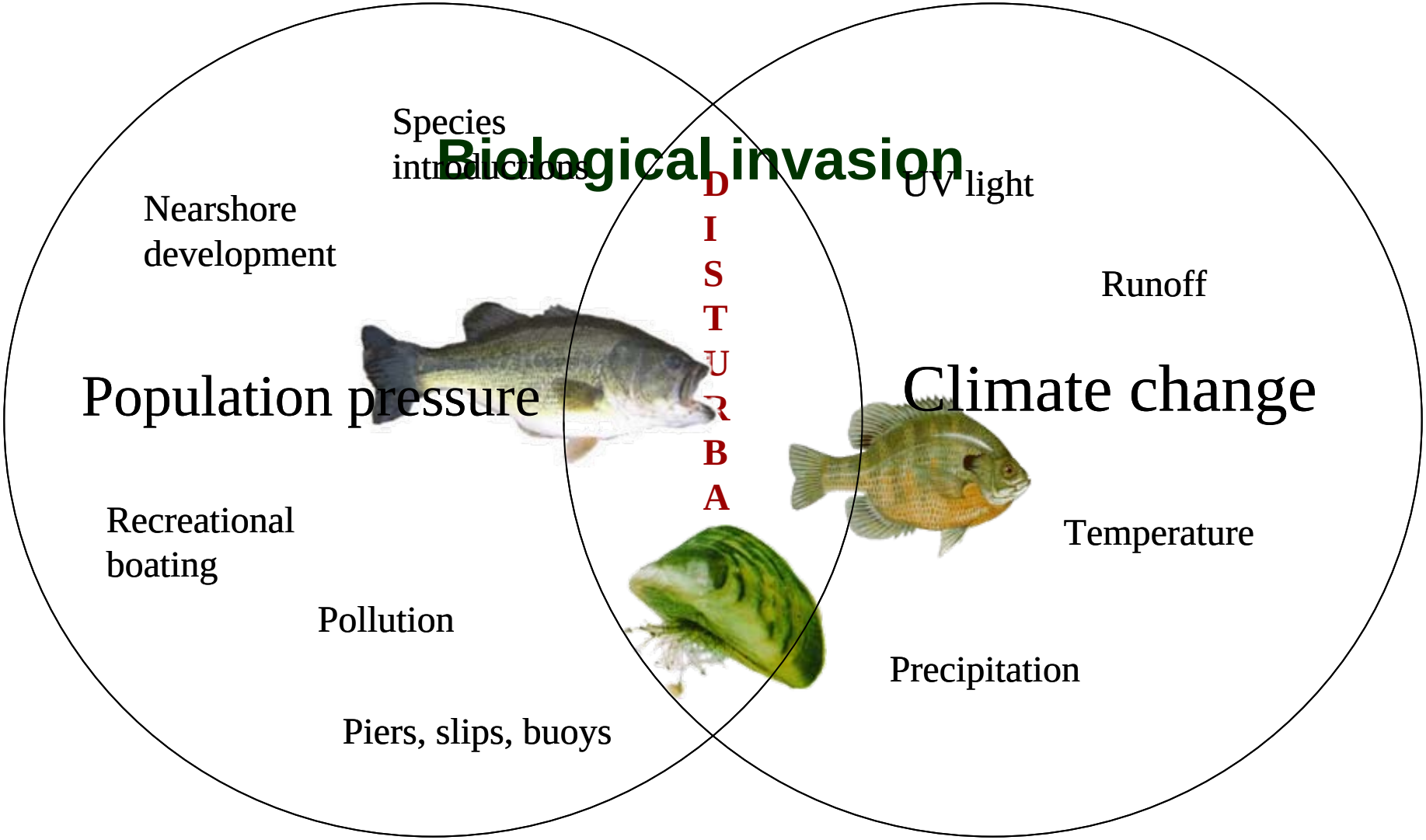
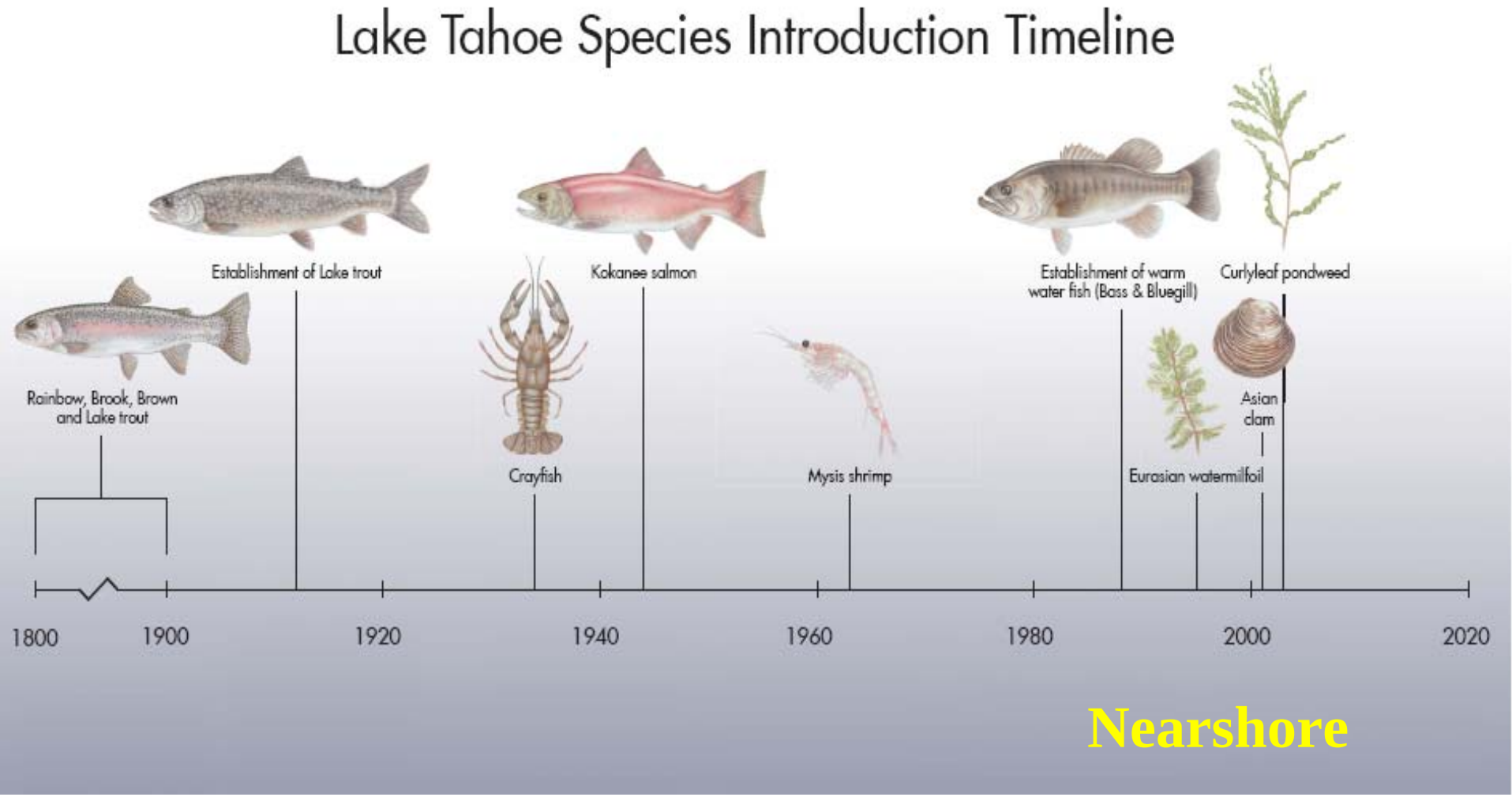
Disturbance leads to biological invasion in lakes





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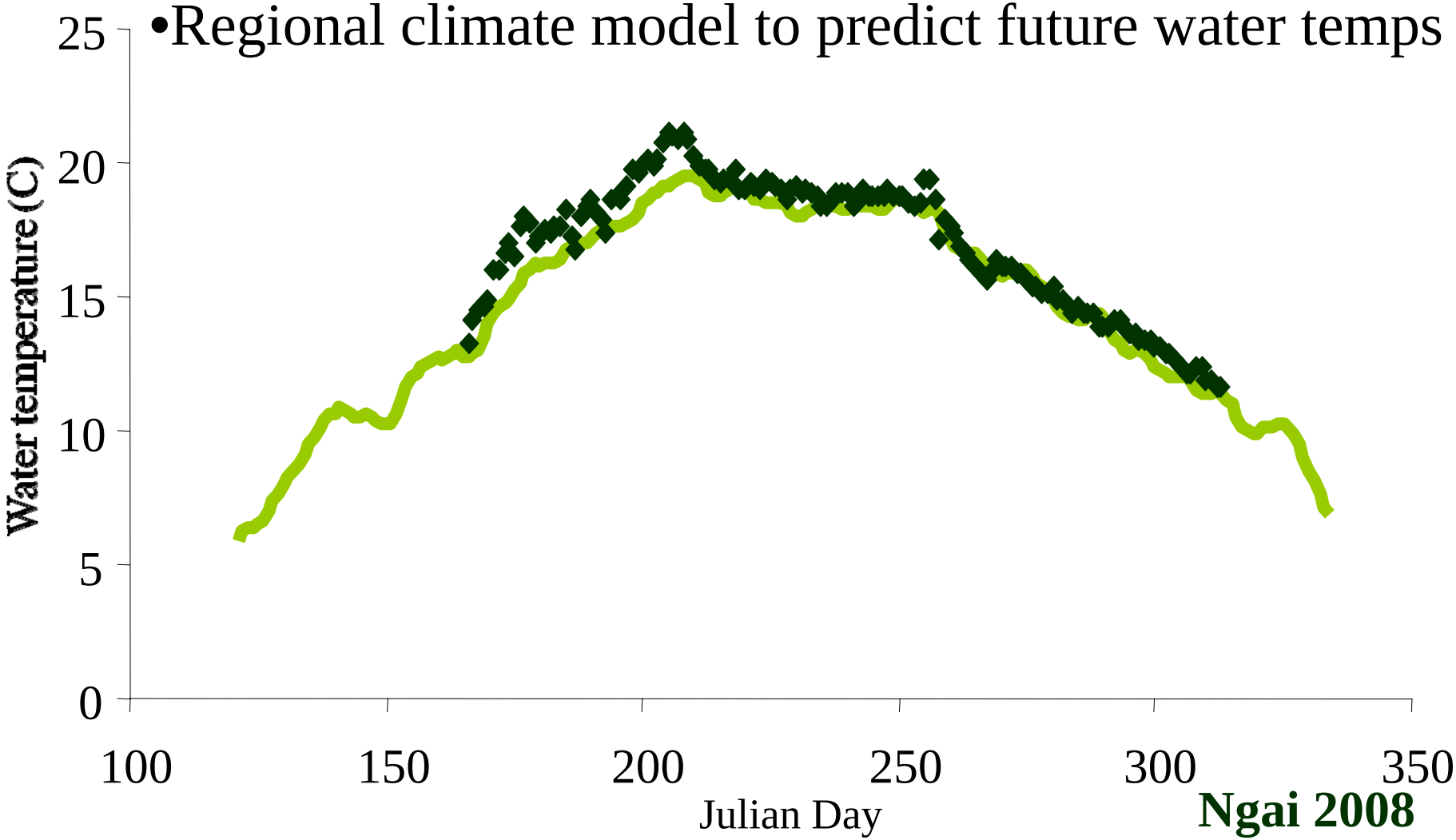
Data gaps for nearshore warming trends in Lake Tahoe

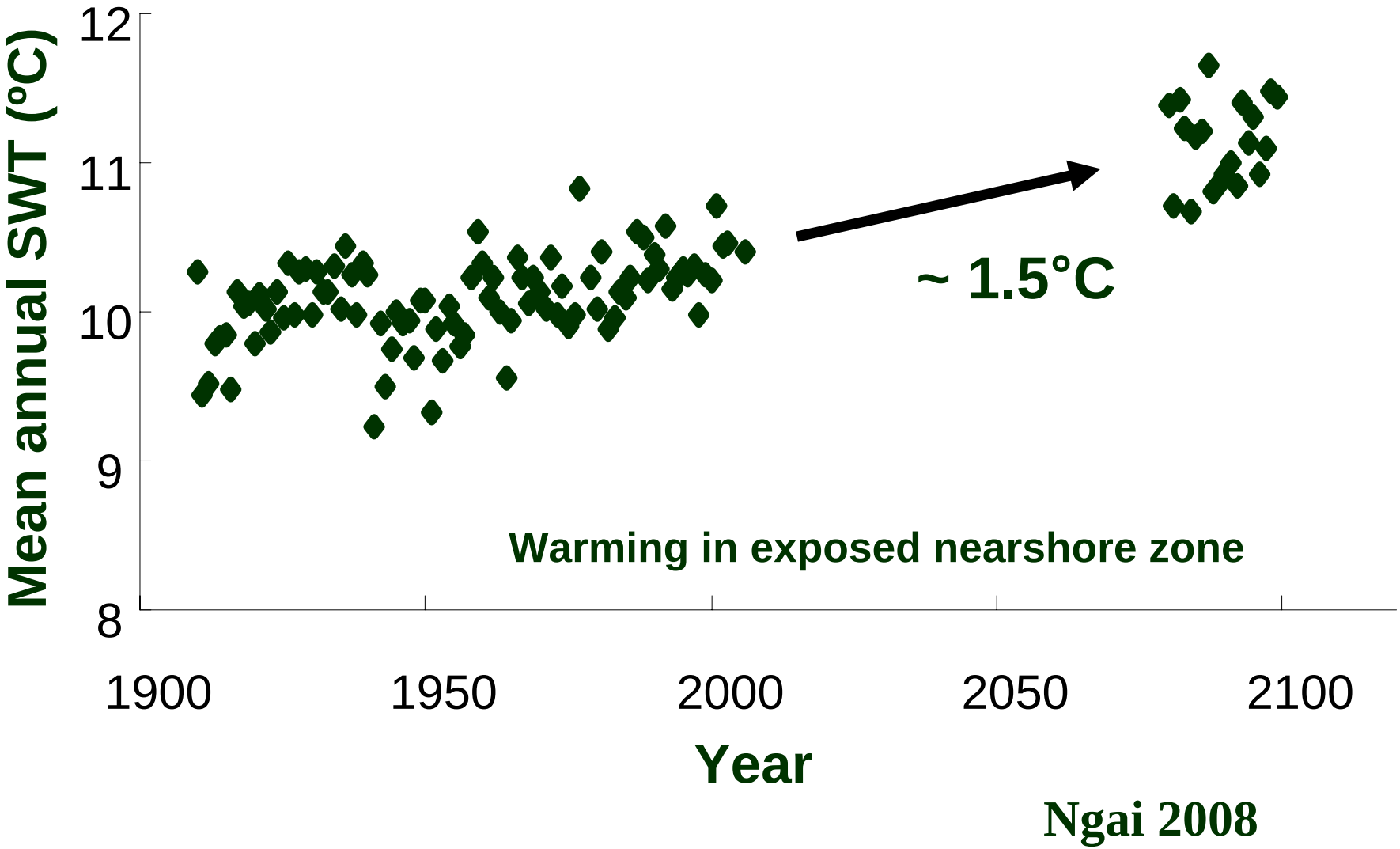
- Deepwater measurements indicate warming (Coats et al. 2007)
- Most aquatic invasions occur in the nearshore zone
- Need to develop an understanding of temperature changes occurring in the nearshore

Creation of nearshore temperature model

- Air water temperature relationship
- Historical air temps to predict historical water temps
- Regional climate model to predict future water temps

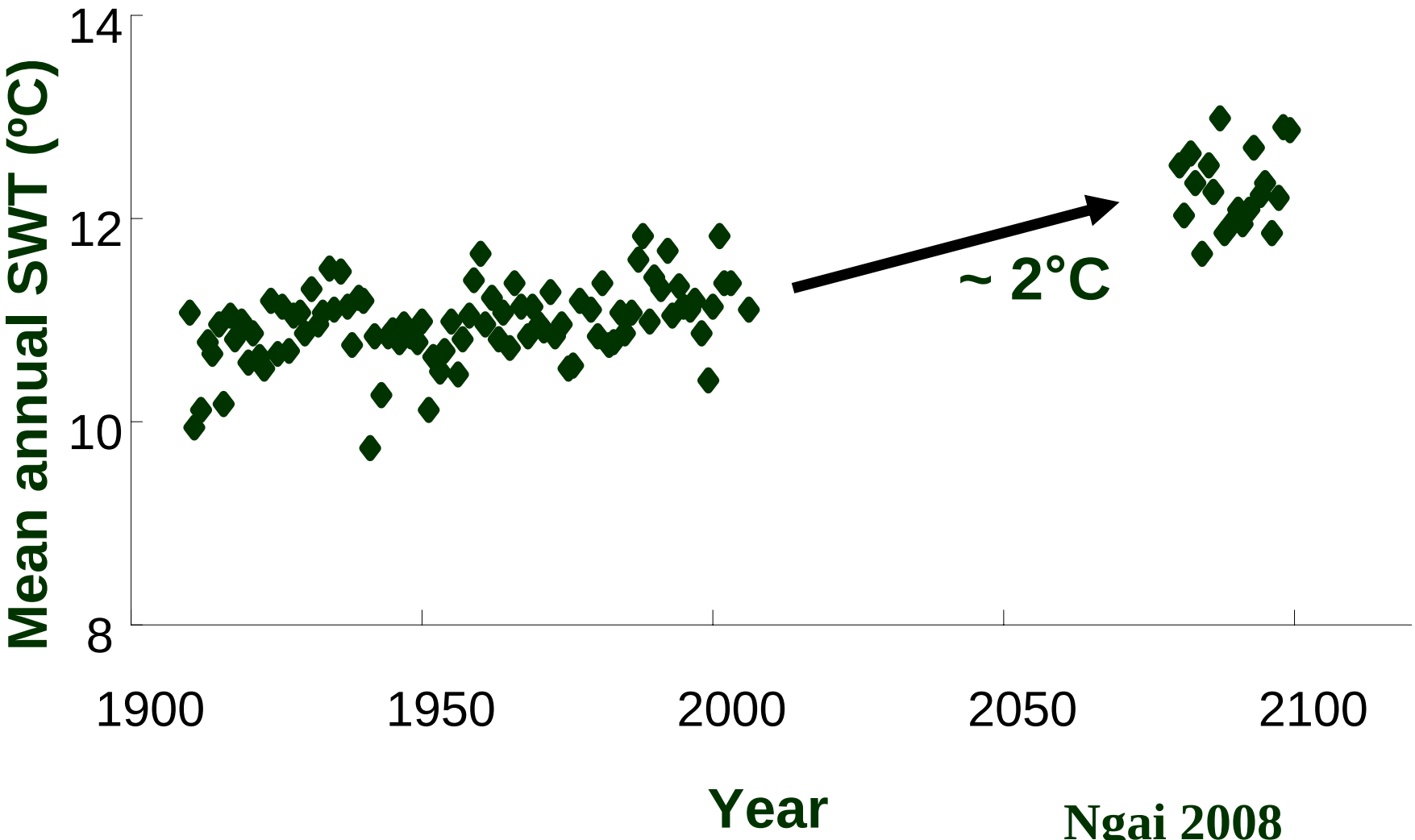


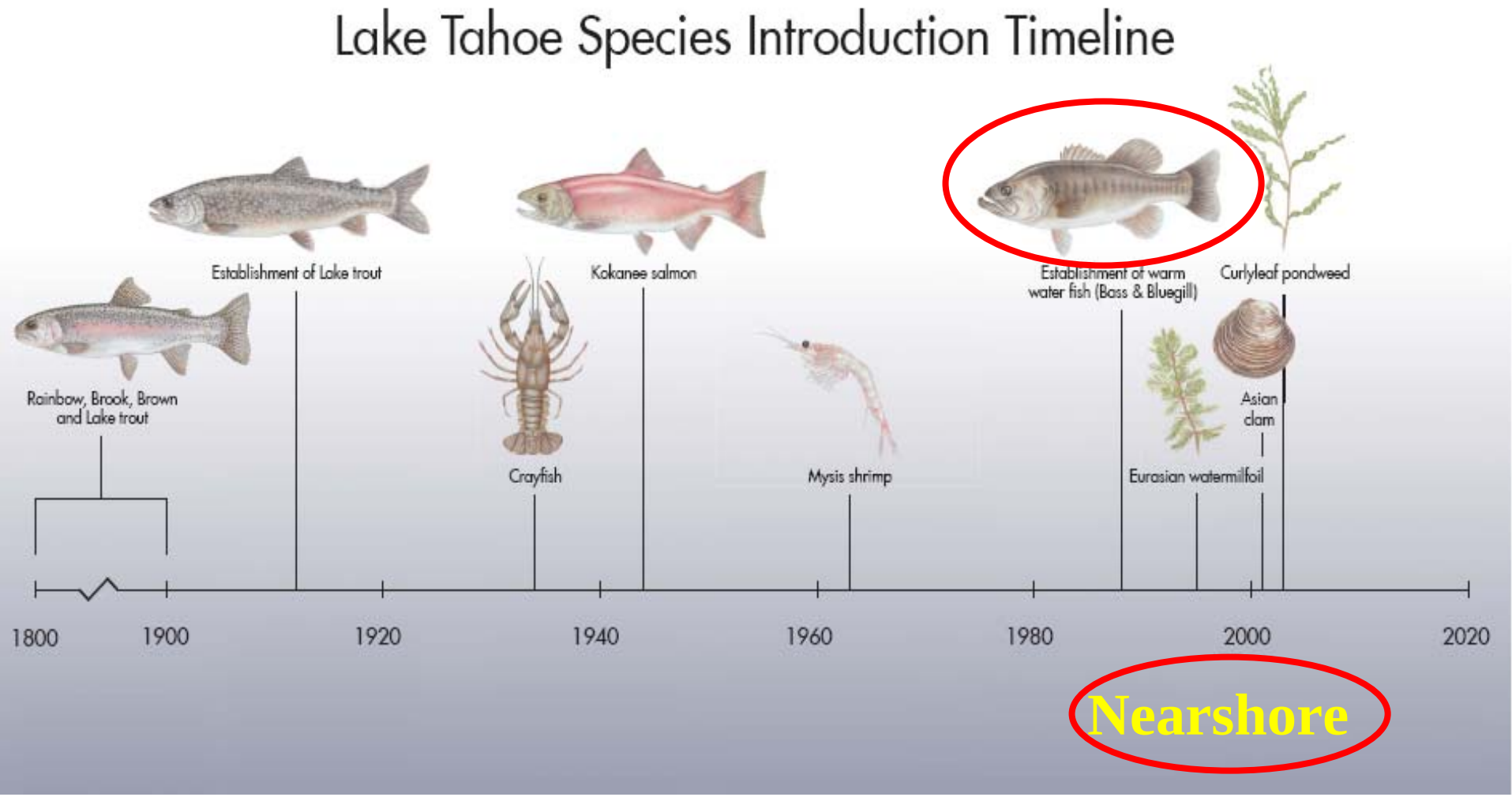
Warming in the exposed nearshore locations (non-marina)



Ngai 2008

Even more warming occurs in disturbed enclosed locations (marinas)





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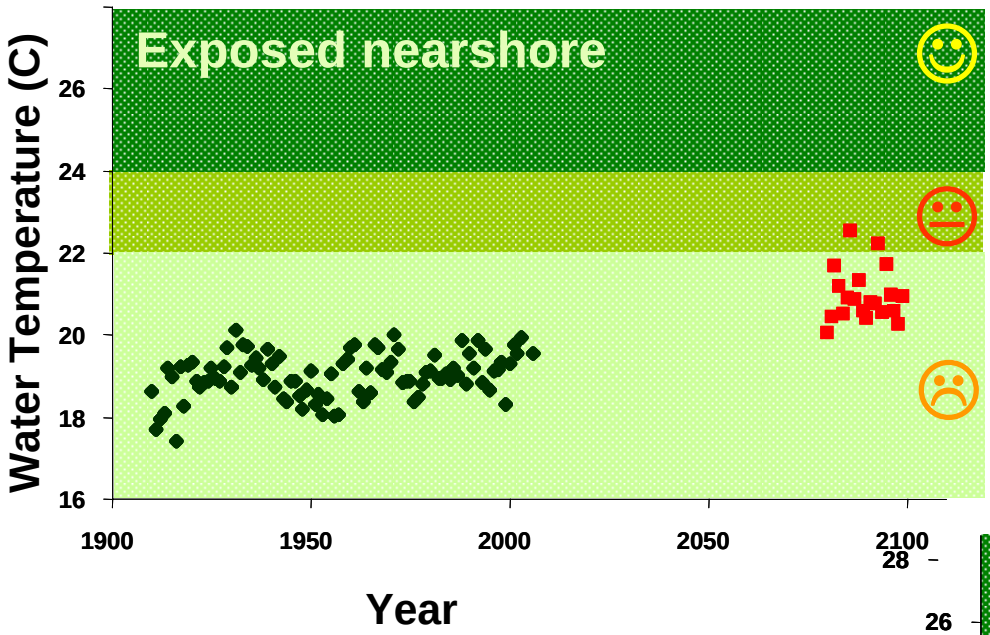
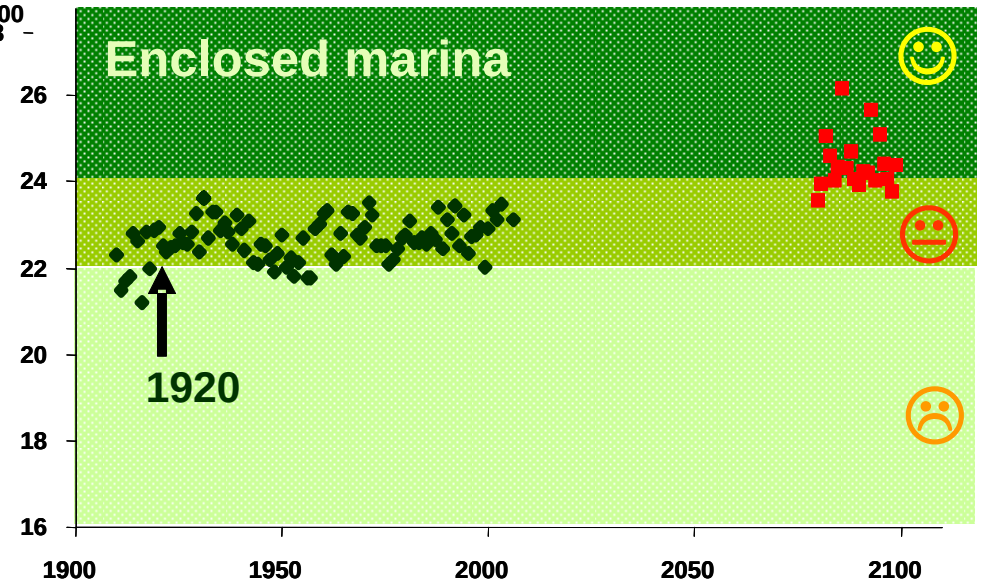
Enclosed marinas are more suitable for bass establishment with potential for exposed locations





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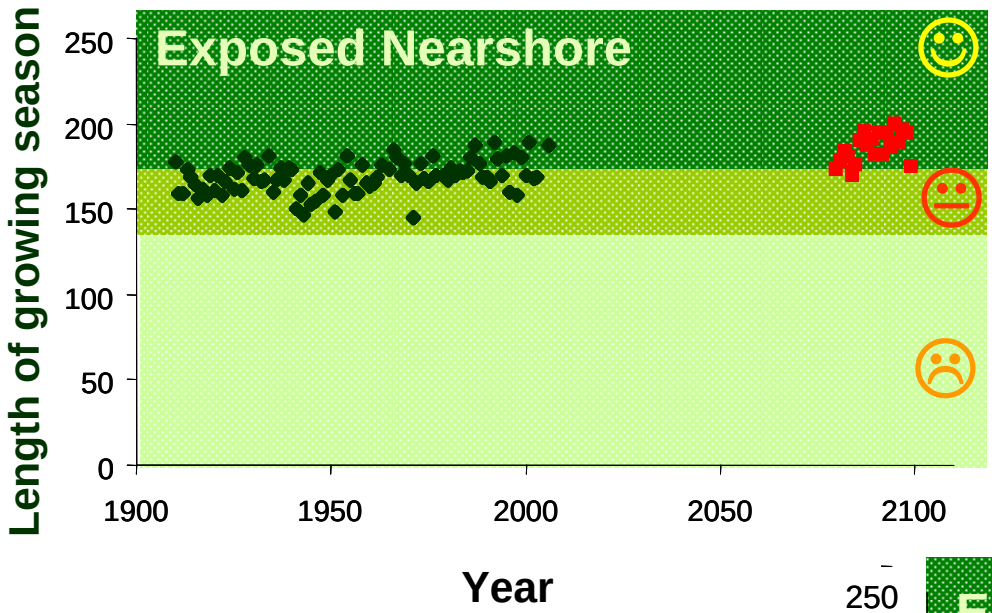
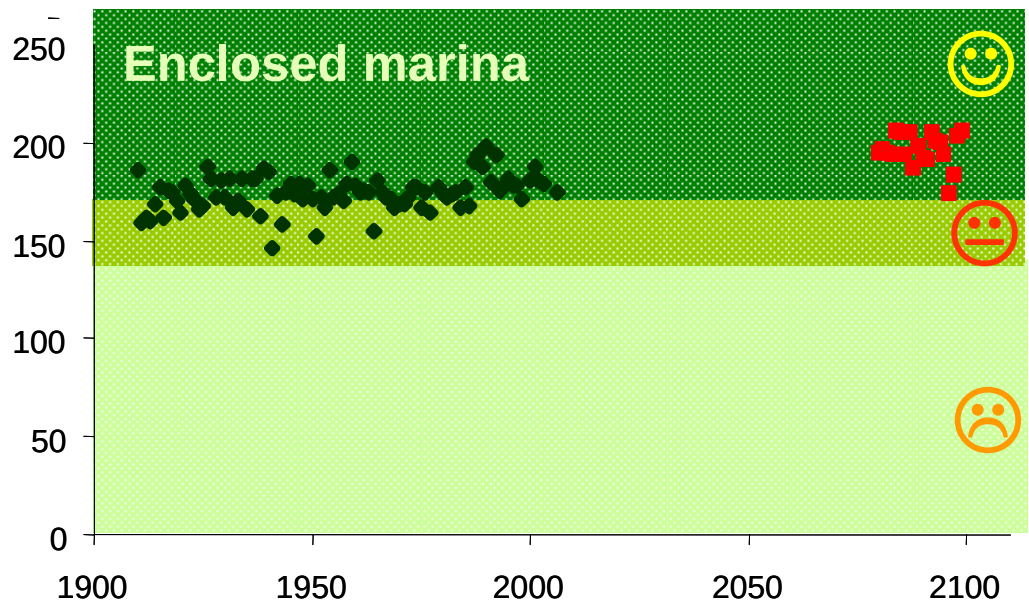
Length of growing season increases for bass in Lake Tahoe





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Disturbance leads to biological invasion in lakes

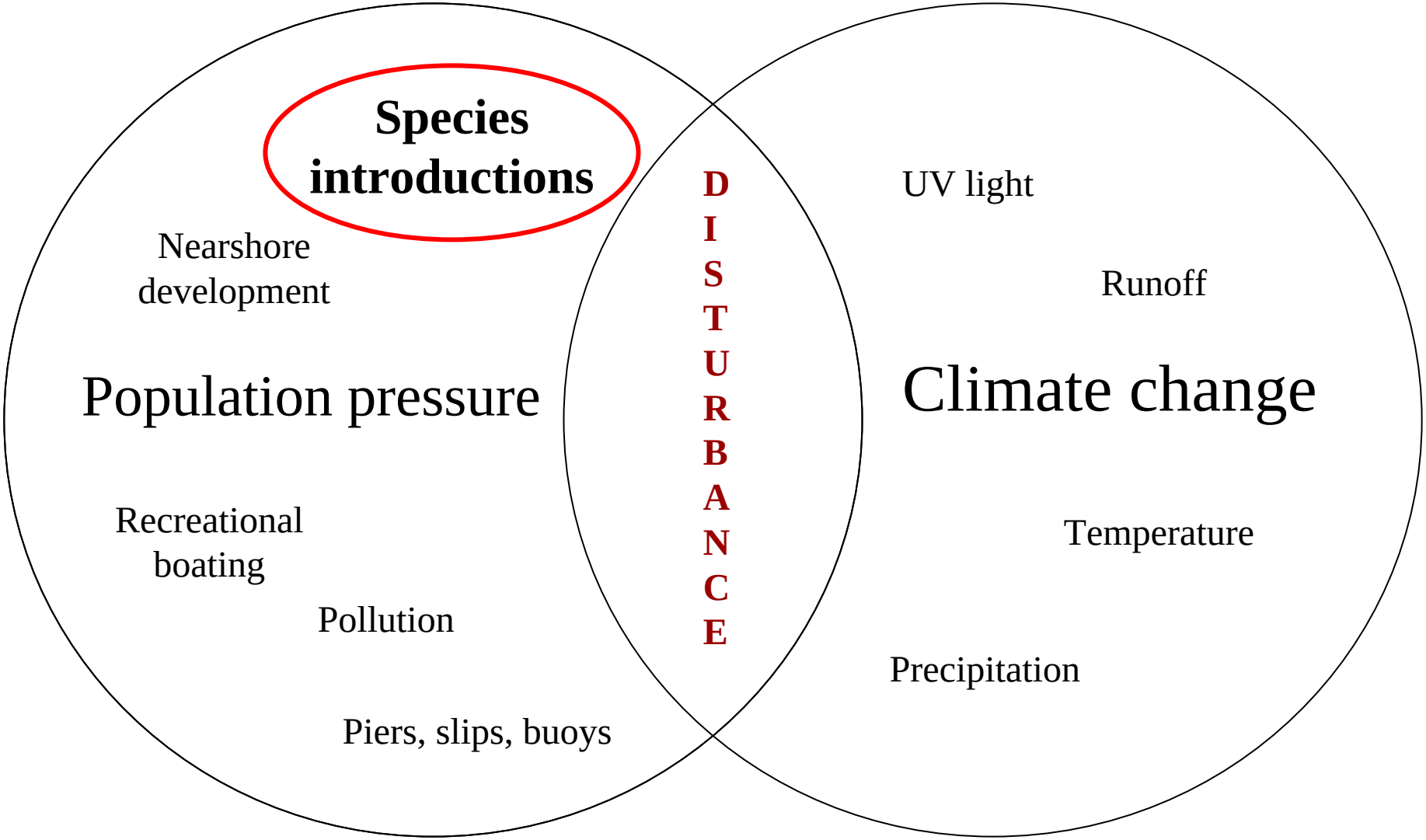

Photo: Brant Allen

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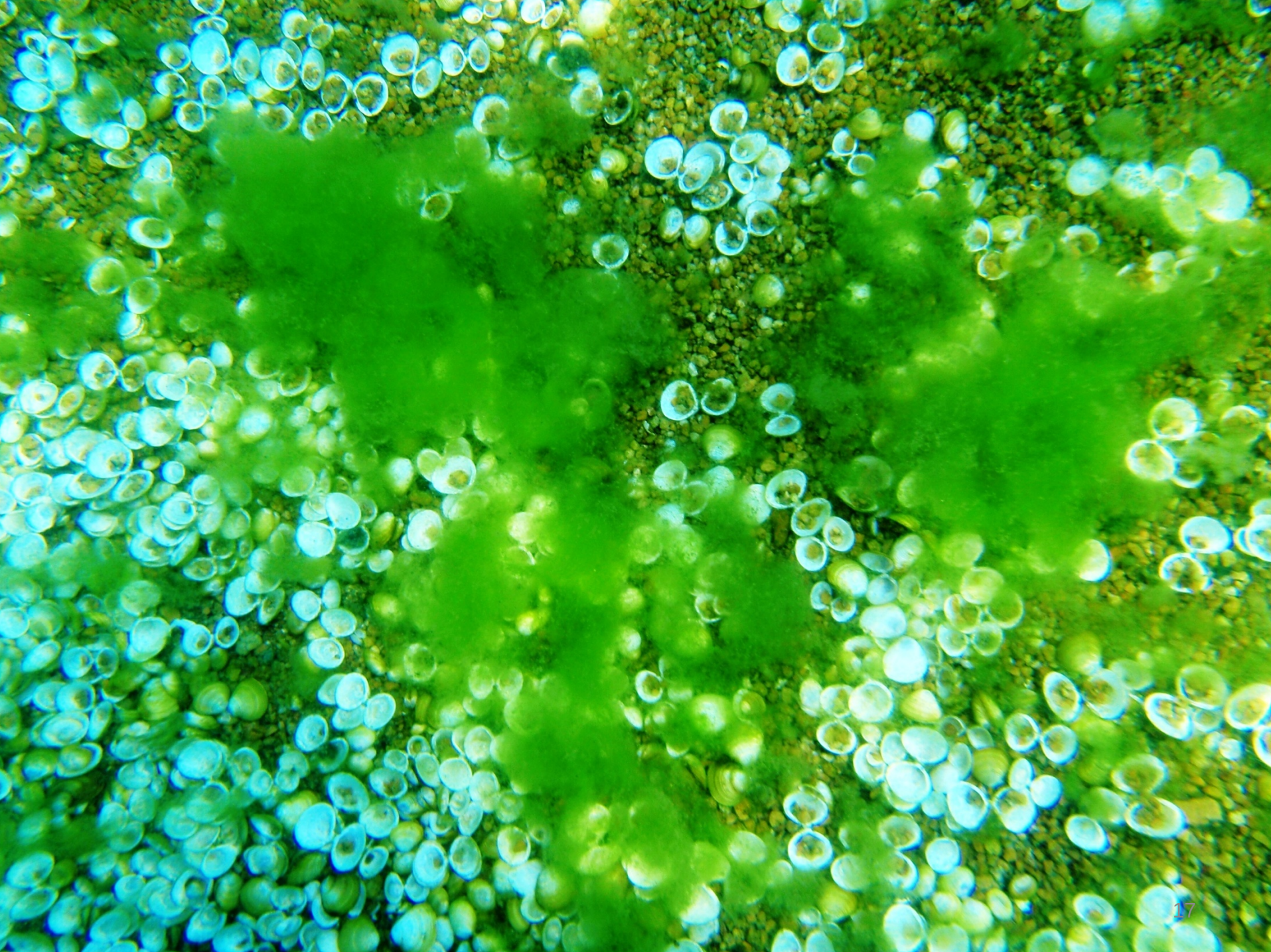


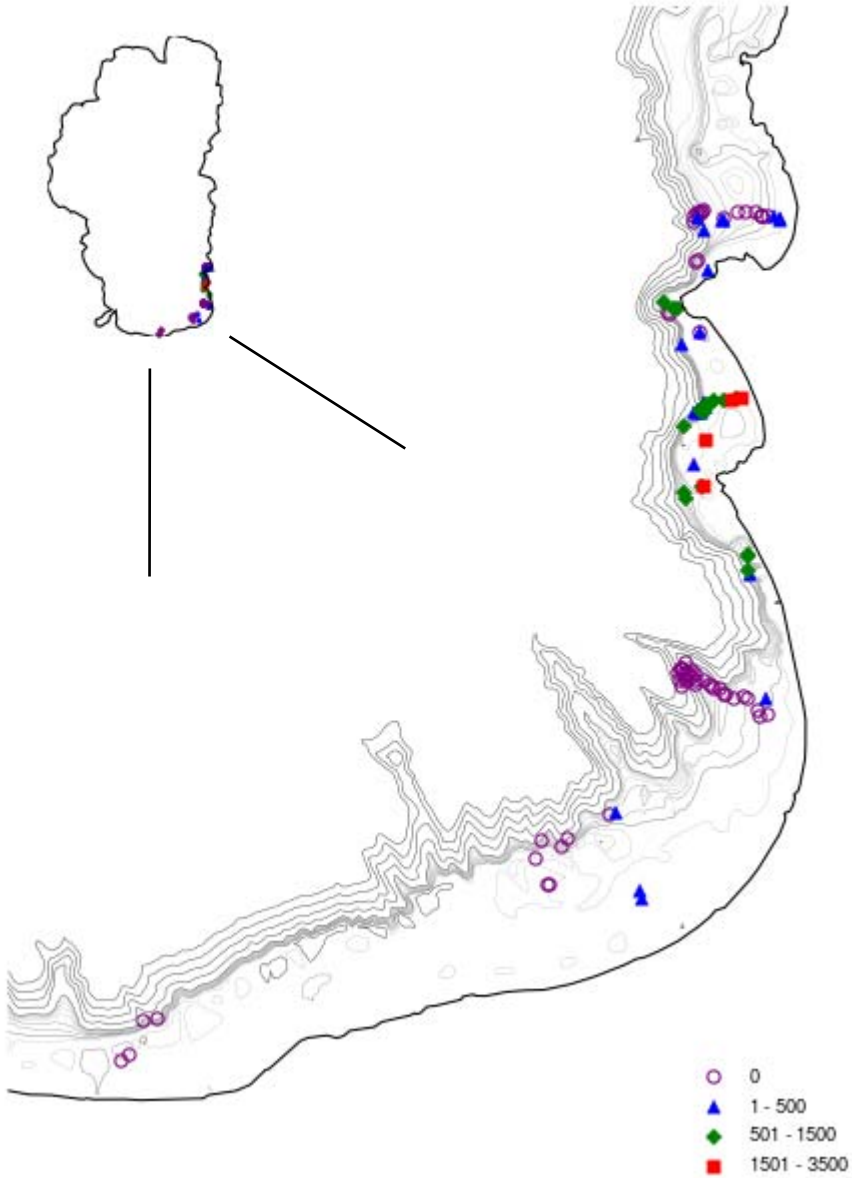
Clams are located along the Southeast shore with wide range of body size and density

Body size range: <1 mm to 28 mm

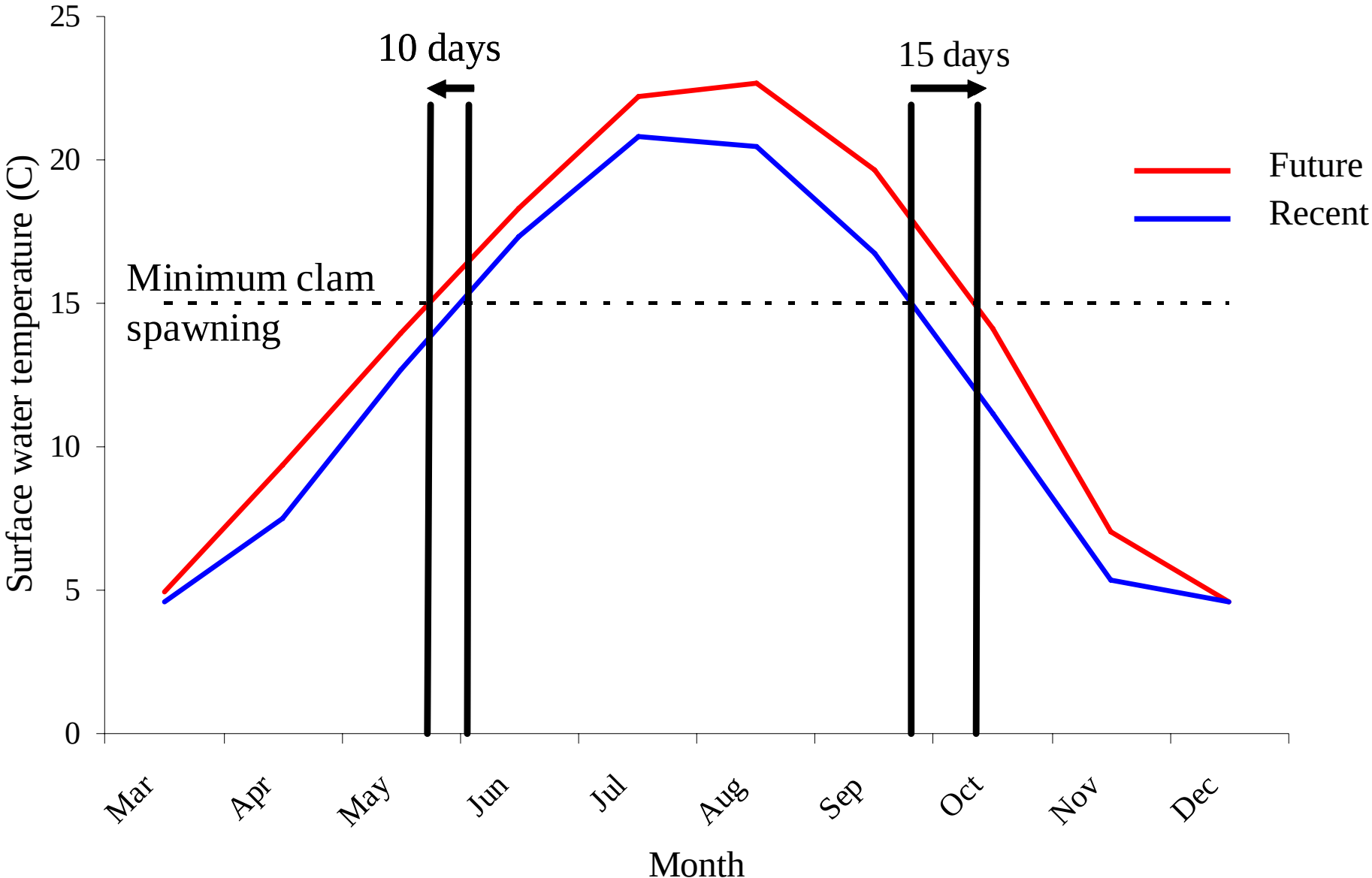
Density: 0 - 3200 clams/m^2

Average density in Marla Bay: 1000 clams/m^2

Lake Tahoe Corbicula Field Survey
August-September 2008



Climate change could potentially increase Asian clam spawning time by ~25 days!!



“Clamate change” in Lake Tahoe

Average Asian clam density in Marla Bay:

1000 clams per m^2

Approximately between 320-390 pediveligers are released daily per clam

(*Gottfried and Osborne 1982, Hall 1984*)

25 more days means 320,000 more clams per m^2!!!!

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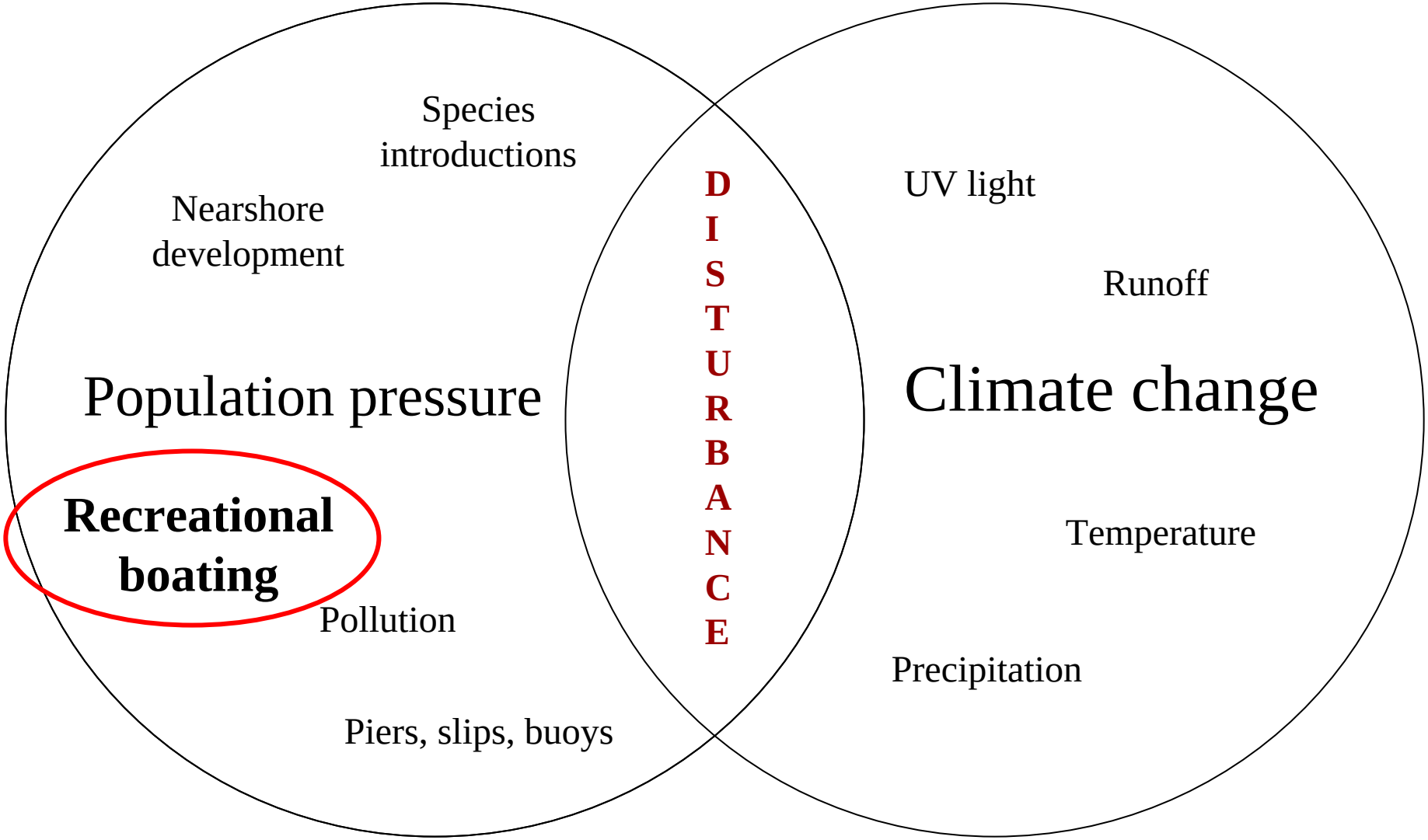
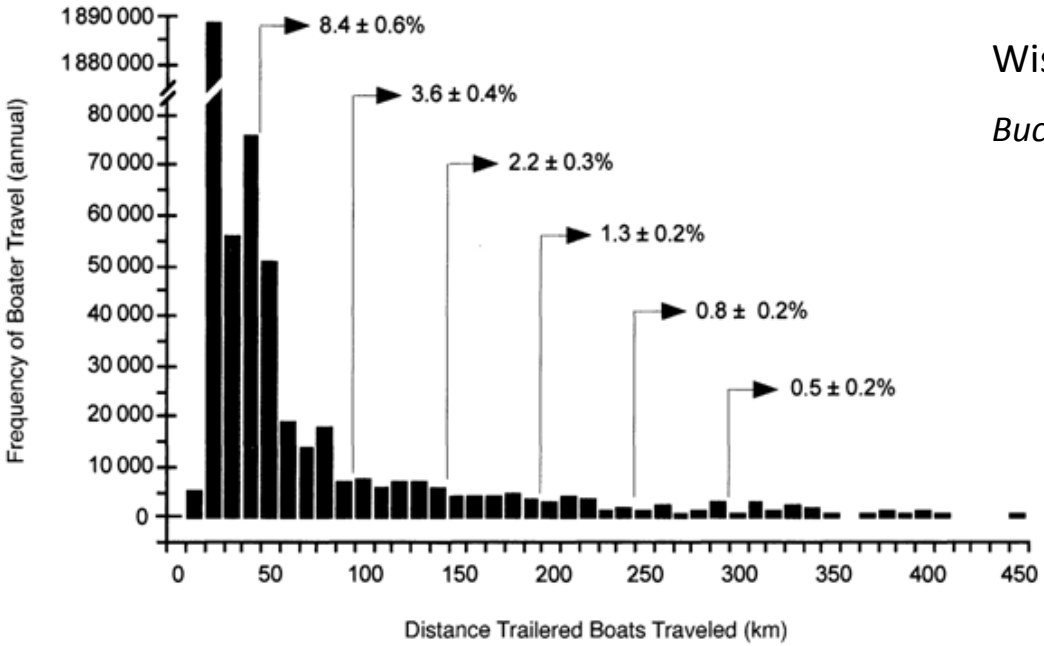
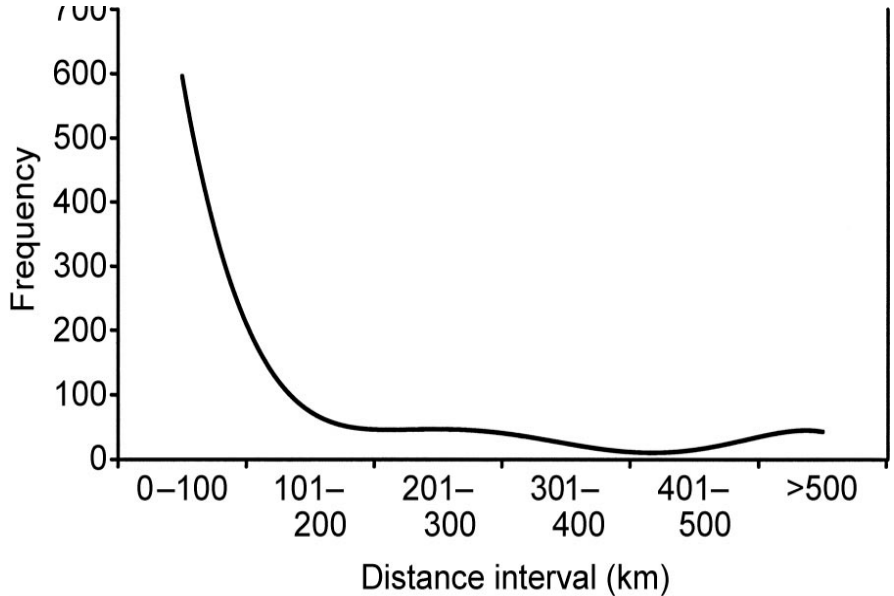




Wisconsin boaters

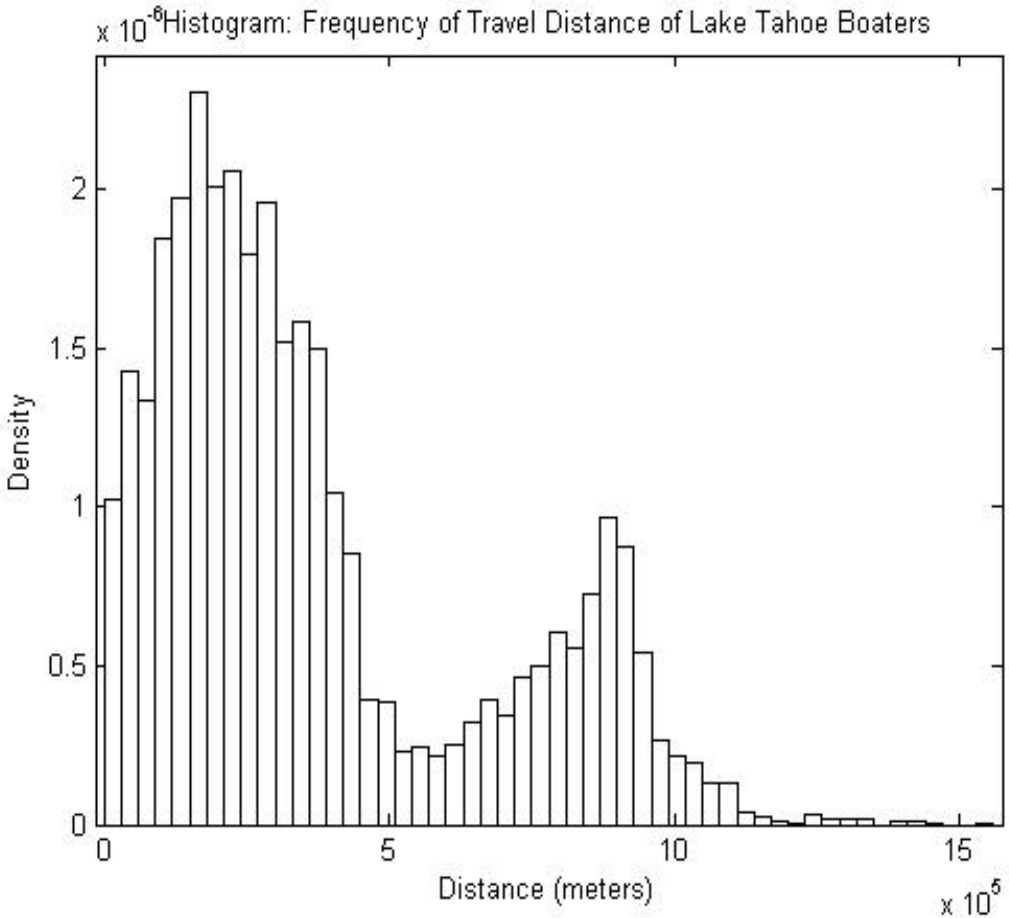
Buchan and Padilla 1999



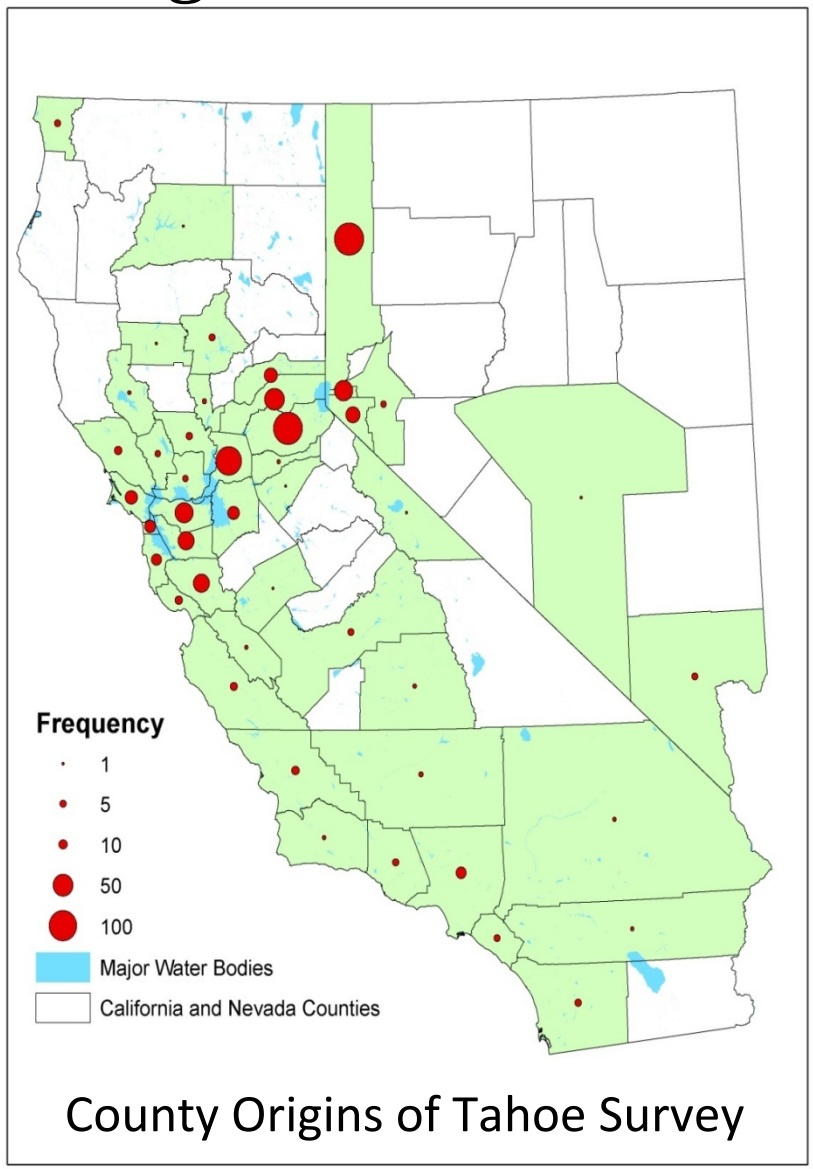
Ontario Boaters

MacIssac et al. 2005

Distances travelled by Lake Tahoe boaters show a bimodal distribution

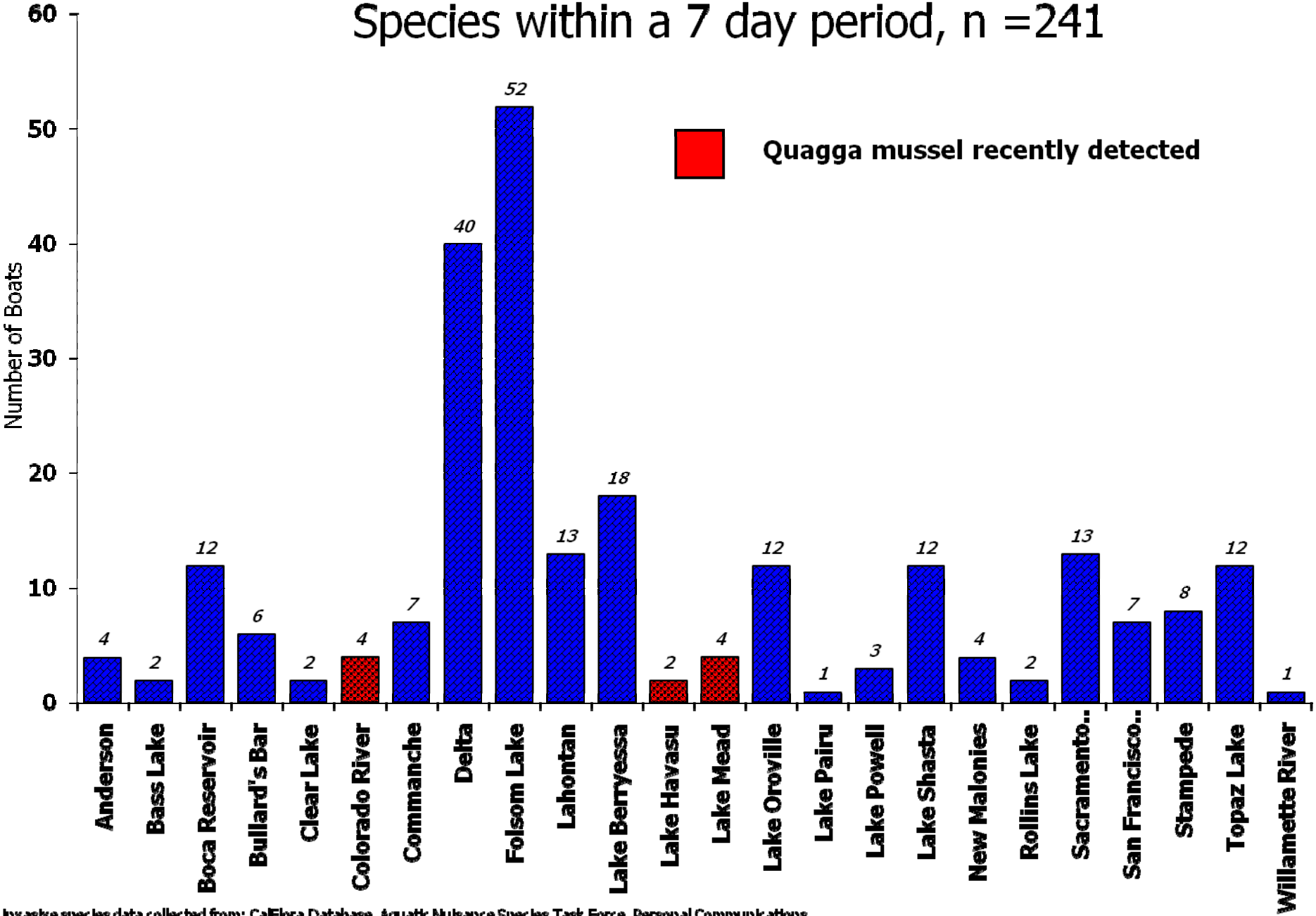


Recreational boaters come to Lake Tahoe from many regions in the West



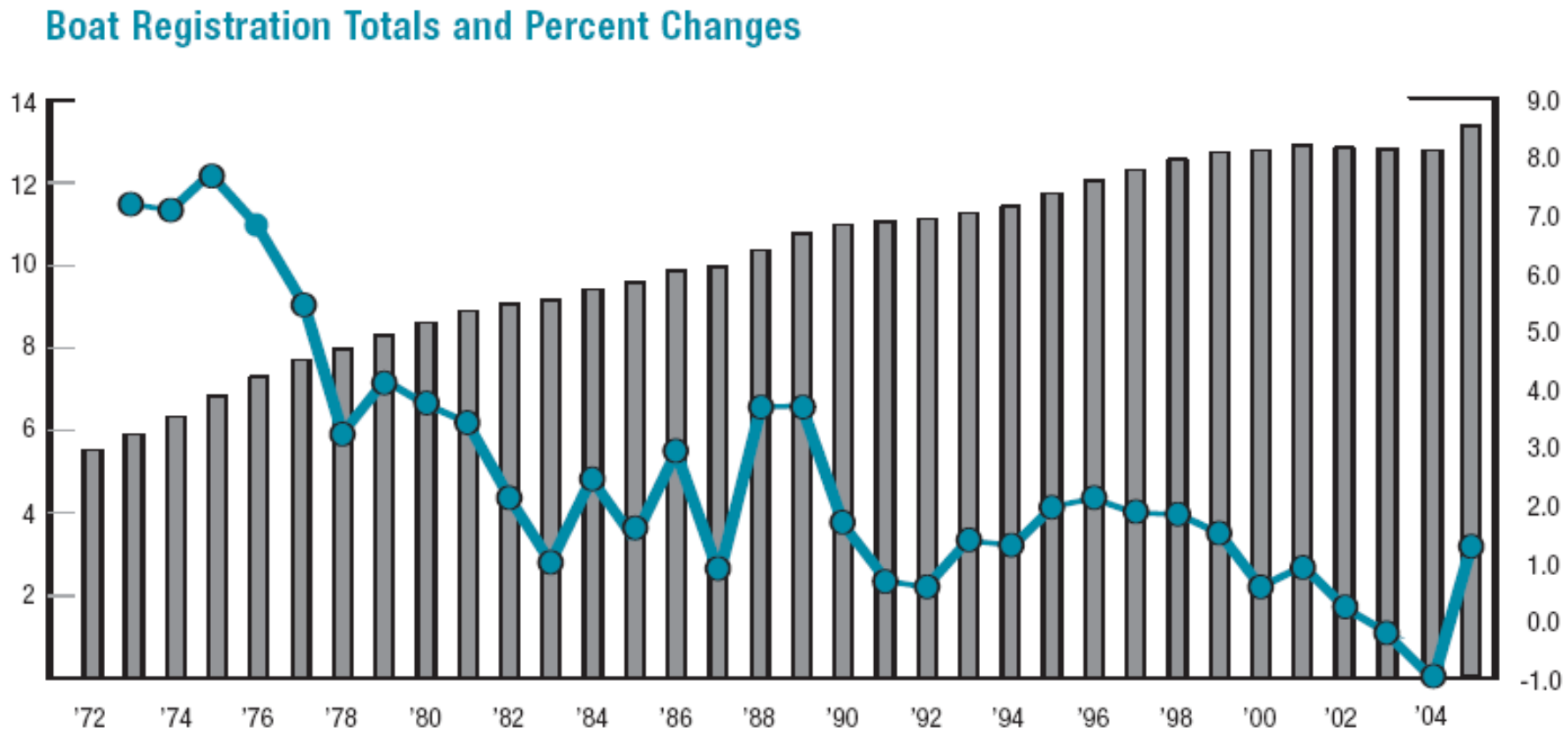
County Origins of Tahoe Survey

Visits from Waterways with Known Aquatic Invasive Species within a 7 day period, n =241



Invasive species data collected from: CalFlora Database, Aquatic Nuisance Species Task Force, Personal Communications

U.S. Boat registrations 1972 – 2005



National Marine Manufacturers Association, 2006

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