

Is Sediment a Bad Word?



Bay Area Ecosystems Climate Change Consortium

Andrew Gunther
Executive Coordinator

STATUS AND TRENDS REPORT
ON
DREDGING
AND
WATERWAY MODIFICATION
IN THE
SAN FRANCISCO ESTUARY



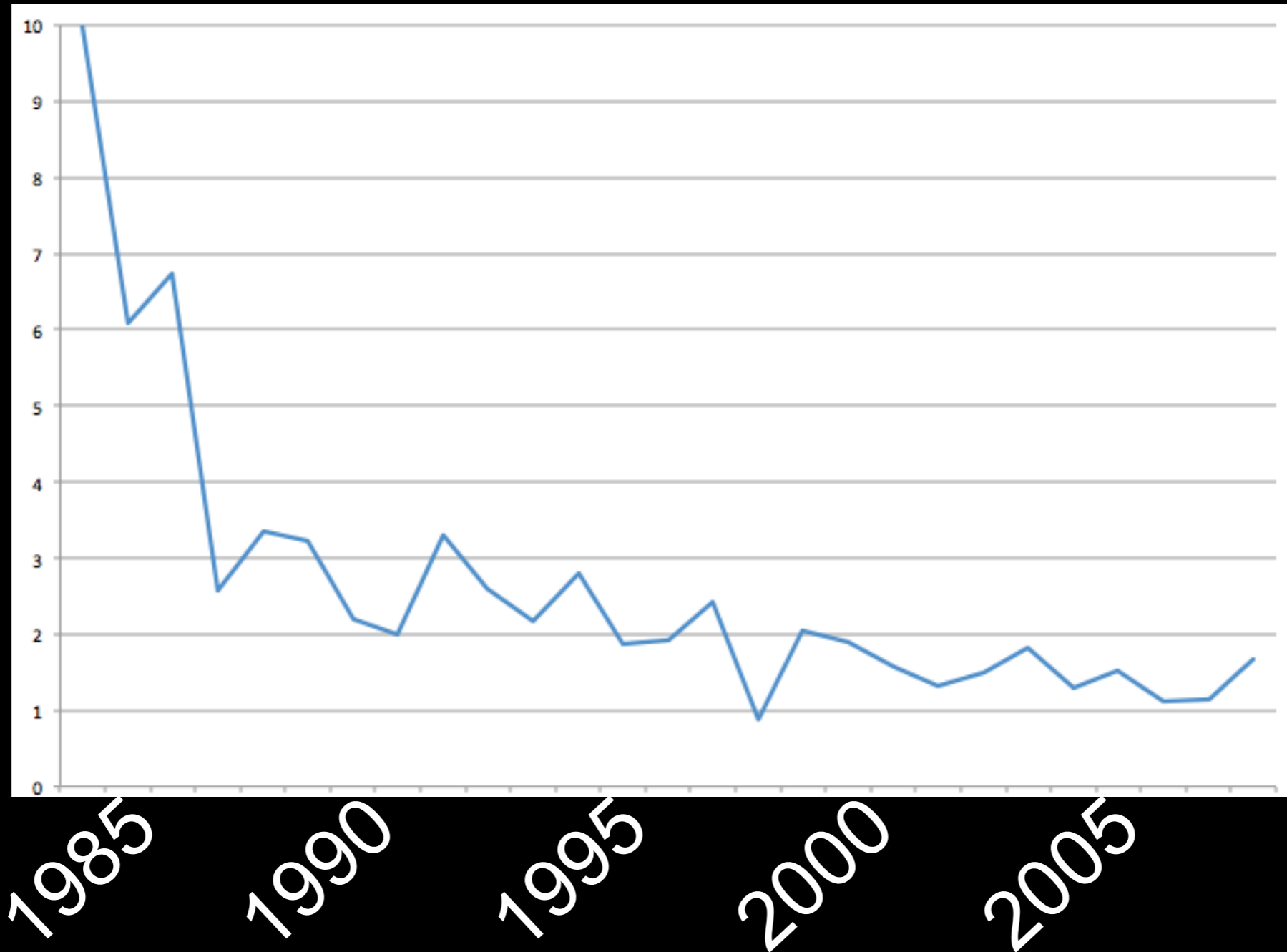
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March
1990

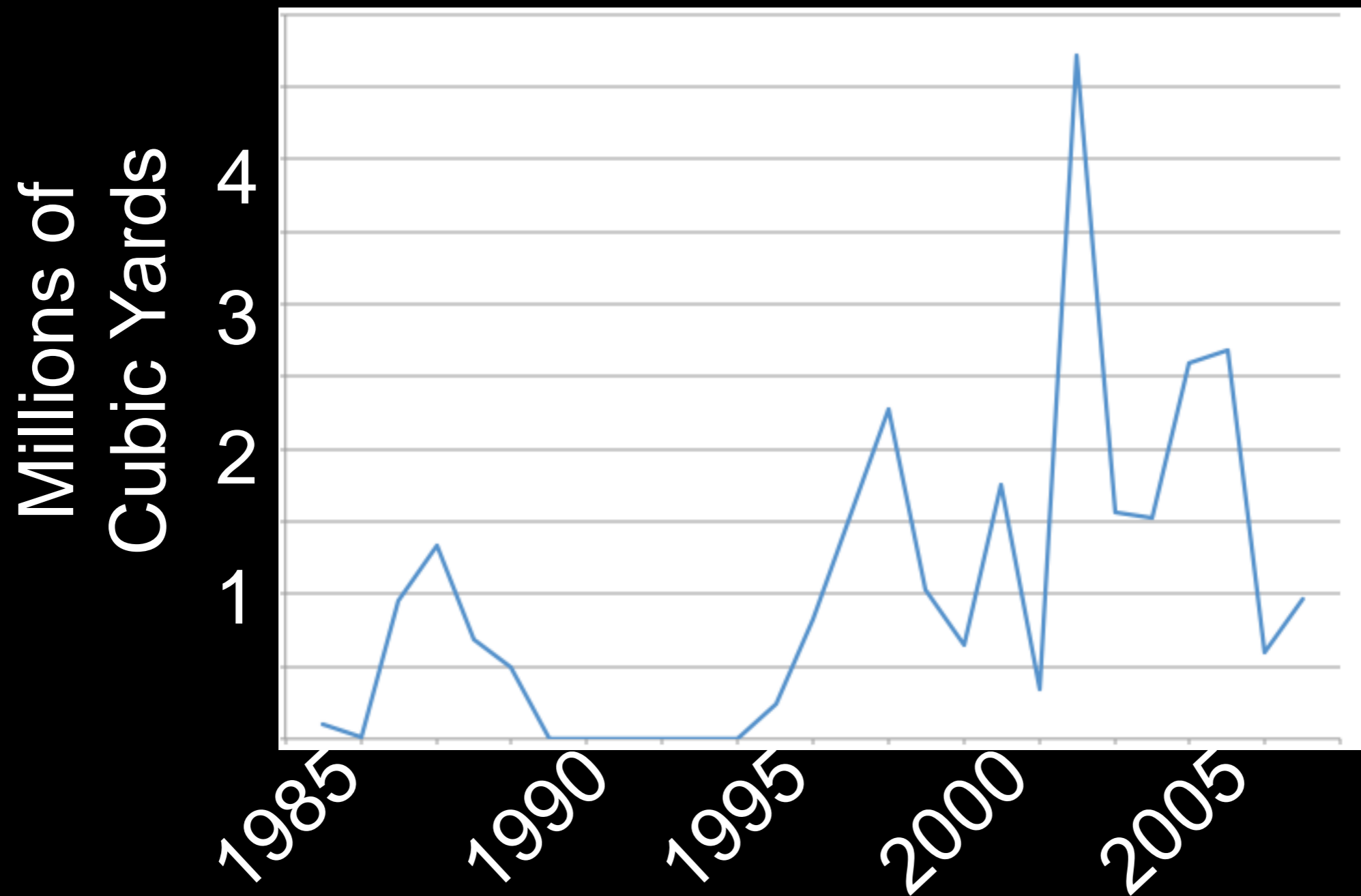
In-Bay Disposal of Dredged Material

Millions of
Cubic Yards



State of the
Bay 2011

Beneficial Re-use and Upland Disposal of Dredged Sediment





THE
LONDON, EDINBURGH, AND DUBLIN
PHILOSOPHICAL MAGAZINE
AND
JOURNAL OF SCIENCE.

[FIFTH SERIES.]

APRIL 1896.

XXXI. *On the Influence of Carbonic Acid in the Air upon the Temperature of the Ground.* By Prof. SVANTE ARRHENIUS*.

I. *Introduction : Observations of Langley on Atmospheric Absorption.*

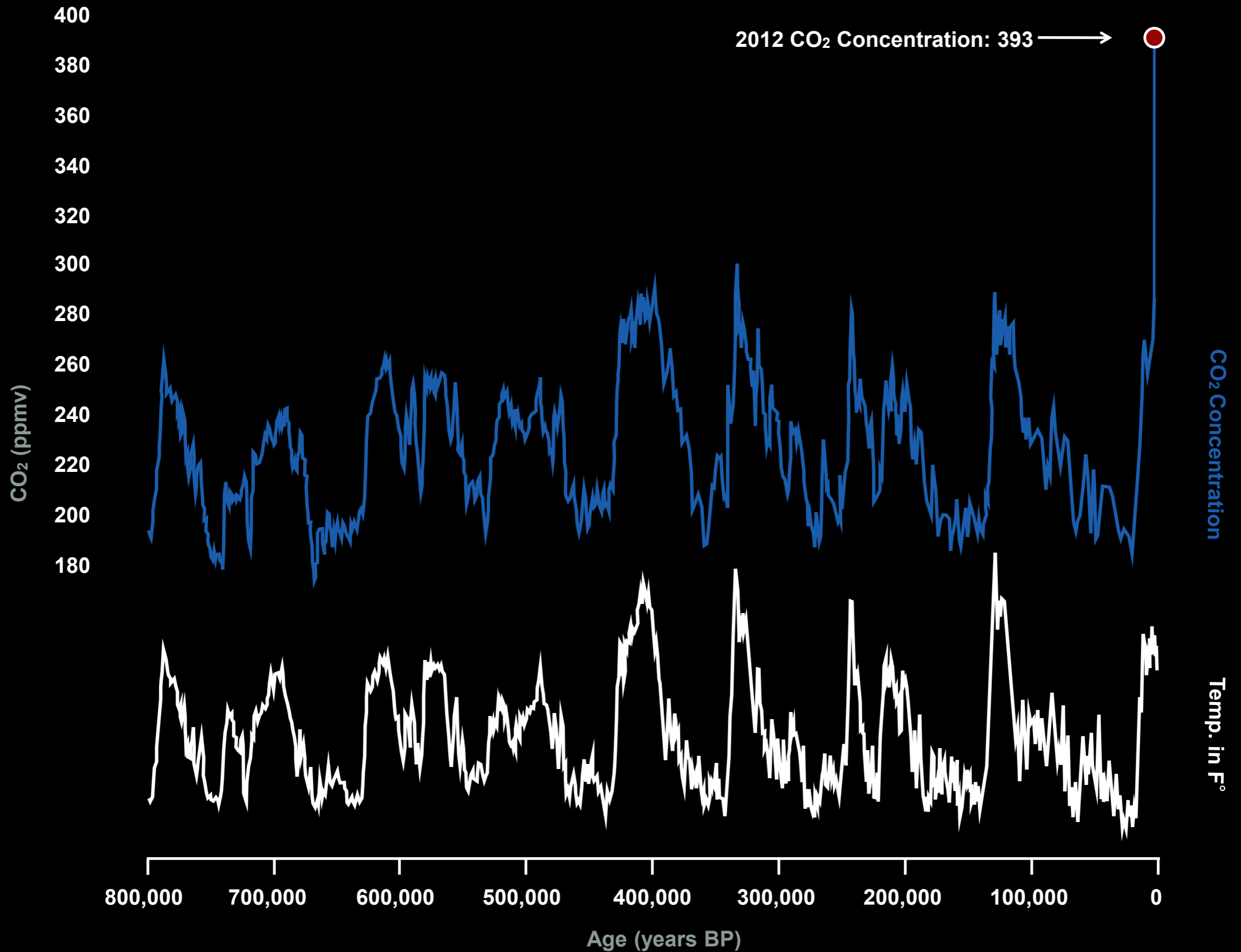
A GREAT deal has been written on the influence of the absorption of the atmosphere upon the climate. Tyndall† in particular has pointed out the enormous importance of this question. To him it was chiefly the diurnal and annual variations of the temperature that were lessened by this circumstance. Another side of the question, that has long attracted the attention of physicists, is this : Is the mean temperature of the ground in any way influenced by the presence of heat-absorbing gases in the atmosphere? Fourier‡ maintained that the atmosphere acts like the glass of a hot-house, because it lets through the light rays of the sun but retains the dark rays from the ground. This idea was elaborated by Pouillet§ ; and Langley was by some of his researches led to the view, that "the temperature of the earth under direct sunshine, even though our atmosphere were present as now, would probably fall to -200° C., if that atmosphere did not possess the quality of selective

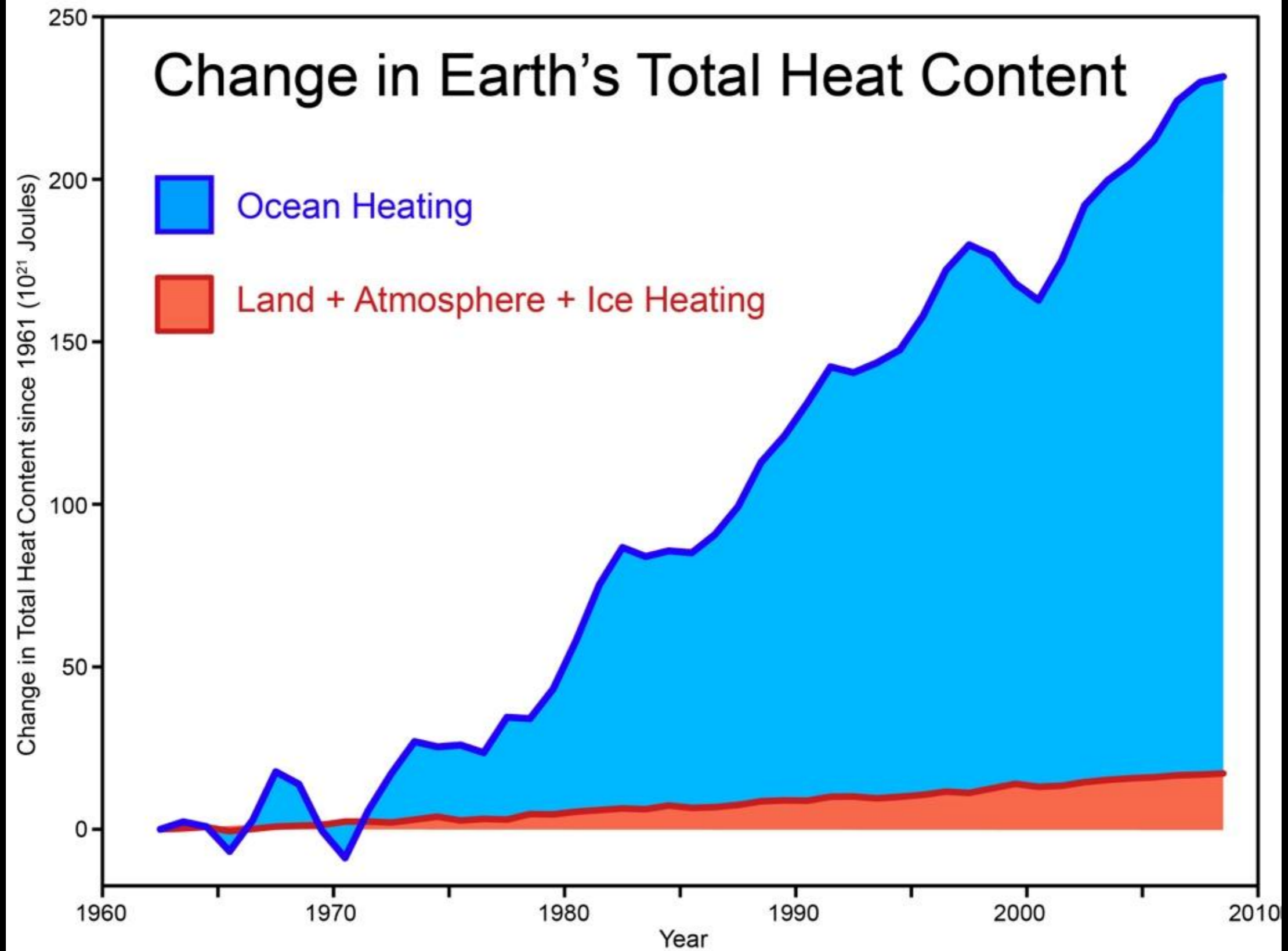
* Extract from a paper presented to the Royal Swedish Academy of Sciences, 11th December, 1895. Communicated by the Author.

† 'Heat and Mode of Motion,' 2nd ed. p. 495 (Lond., 1865).

‡ *Mém. de l'Ac. R. d. Sci. de l'Inst. de France*, t. vii. 1827.

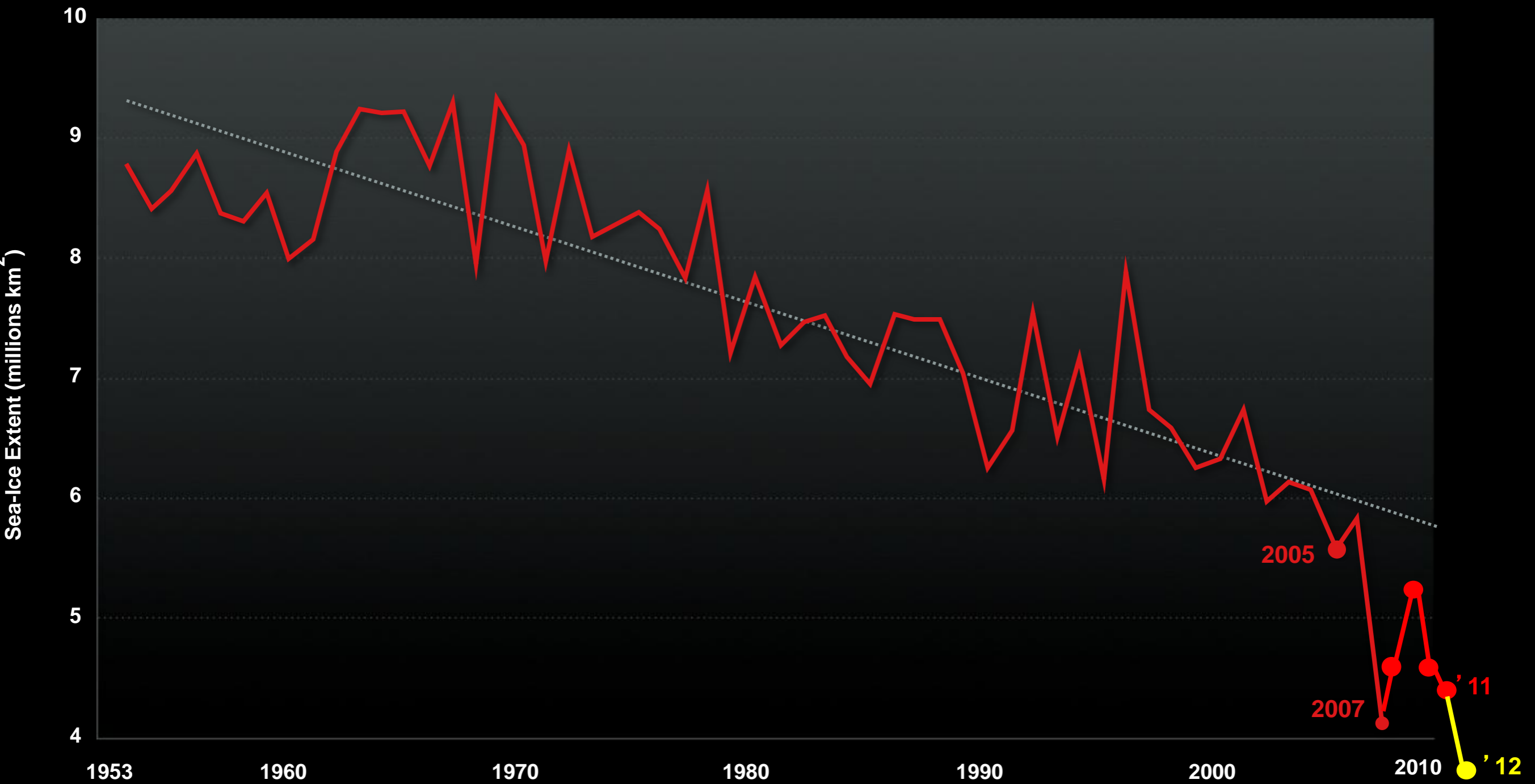
§ *Comptes rendus*, t. vii. p. 41 (1838).





after Church *et al.* 2011
Geophysical Research Letters

Northern Sea Ice Extent





Pier 14, SF Waterfront
February 17, 2011
californiakingtides.org



Hayward Shoreline



Photo: Mark Taylor

New Year's Eve 2005, 8.9 ft tides and 40mph westerly wind



Highway 1
at
Ocean Beach

January 2010

Jeff Hansen

San Francisco Creek Levee Damage

East Palo Alto, December 24, 2012



“conditions of extreme peril to the safety of persons and property”

Photo: Palo Alto Online

my goodness!

“Oh ~~S#@T!~~”

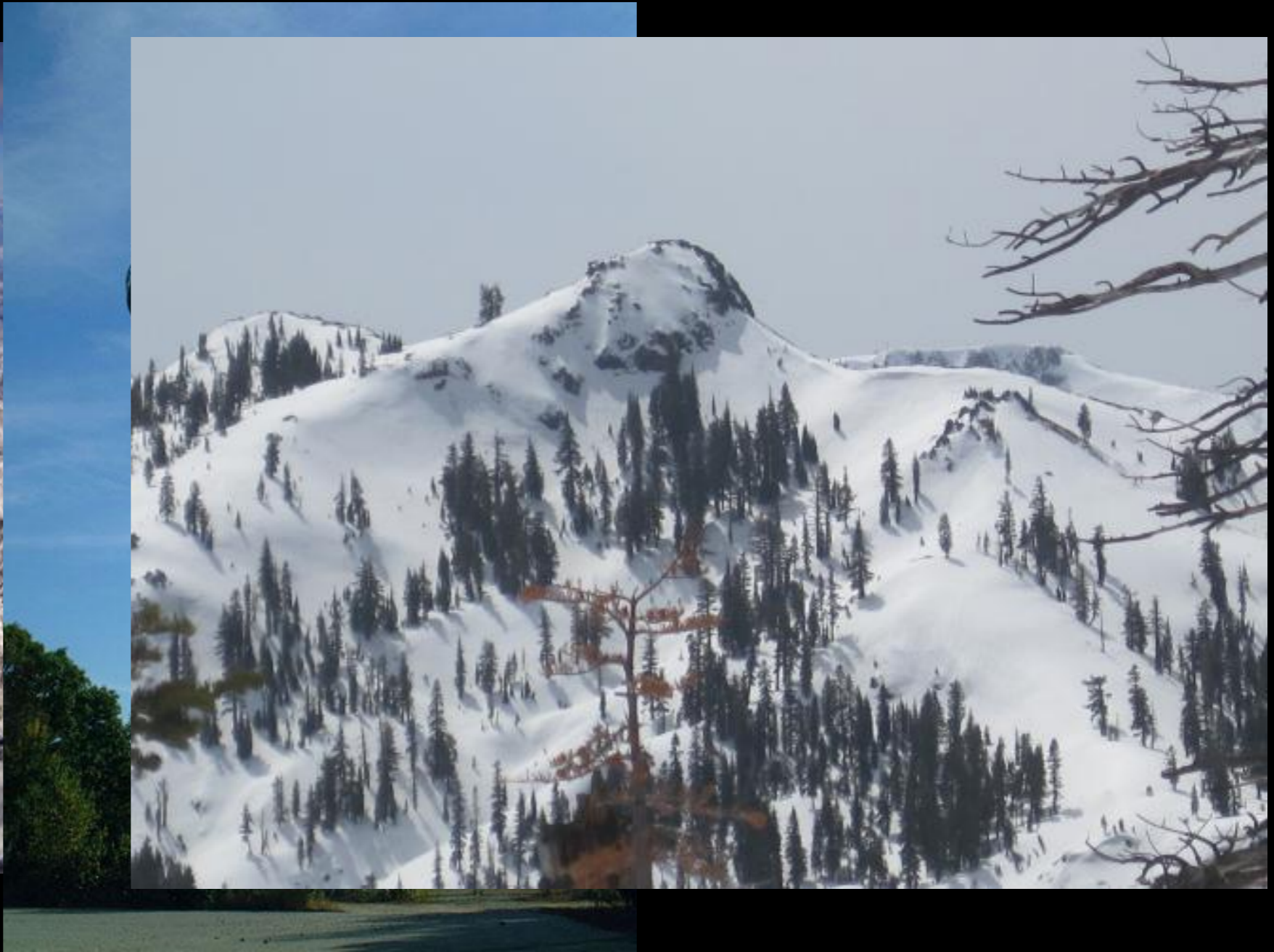


Bay Area Ecosystems Climate Change Consortium



Michael Bukay

The Sierra Nevada Mountains



California's Original Water Towers











Chronicle

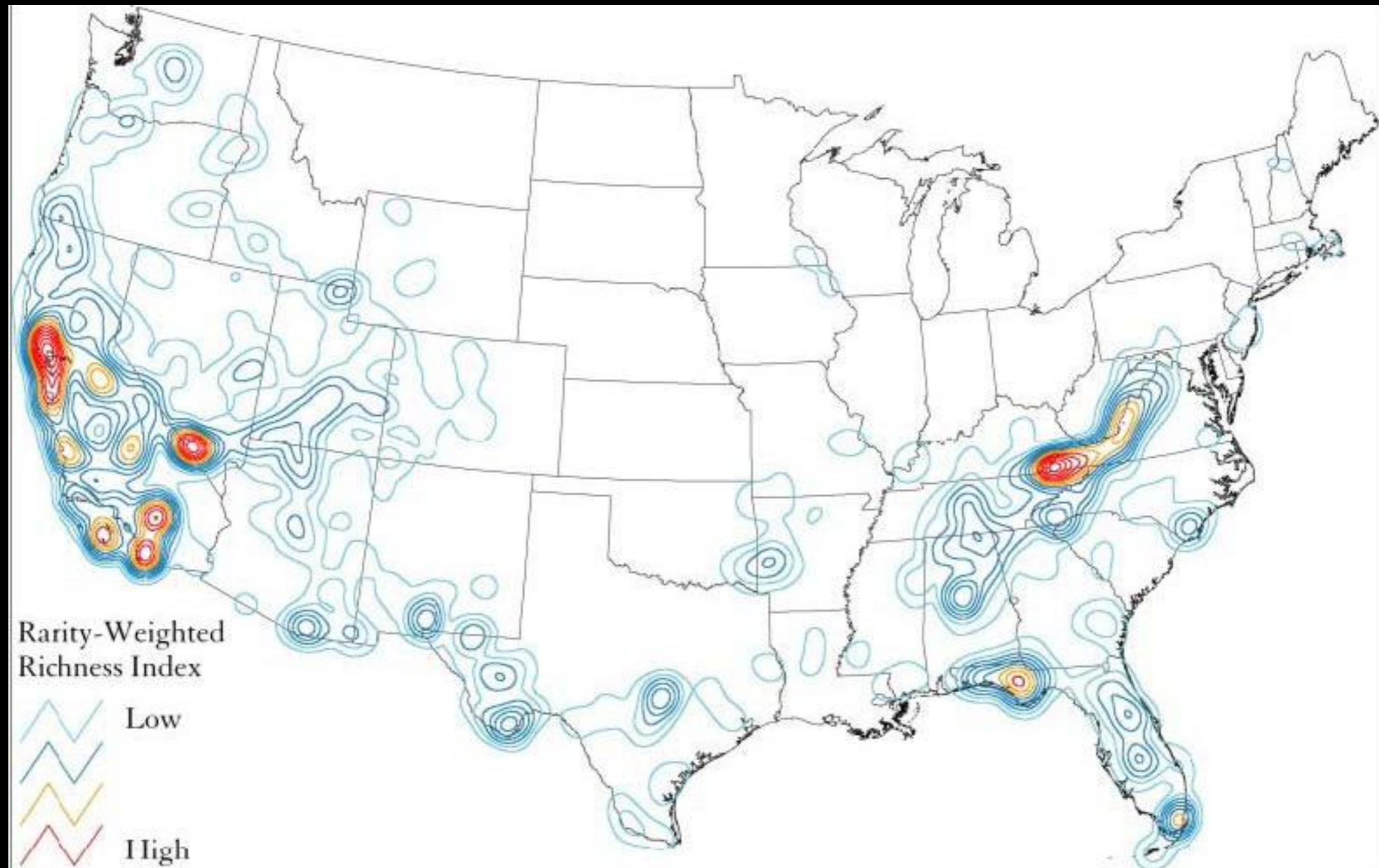
**\$250,000,000
Per Year**





Louison LeBaume





Source: Nature Conservancy (2000)



Goals of BAECCC

- Reduce the negative impacts of climate change on Bay Area ecosystems and wildlife
- Secure nature's ecological and economic benefits to our community
- Enhance the role of natural systems in mitigating the negative impacts of climate change

Protect the Bay



Protect us from the Bay



Protect us from the Bay

- How much dirt do we need?
- Is that a lot?

Assuming...

- 0.5 - 1.0 MCY/mile
- 250-2,000 miles
- 70 - 300 MCY fill for subsided areas

How much dirt?

200 - 2,200 MCY

3.6 - 24.3 MCY/yr through 2100

Is that a lot?

Dredging: 3 MCY/yr

Natural sediment flux to estuary: 2 – 5 MCY/yr

Human excavation and transport?

Next Steps

- Let's have some engineers check my math
- Discuss implications
- Maybe we shouldn't be taking clean sediment to landfills