

# Ocean and estuarine chemistry: Modern dynamics and paleotracers

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Sciences*

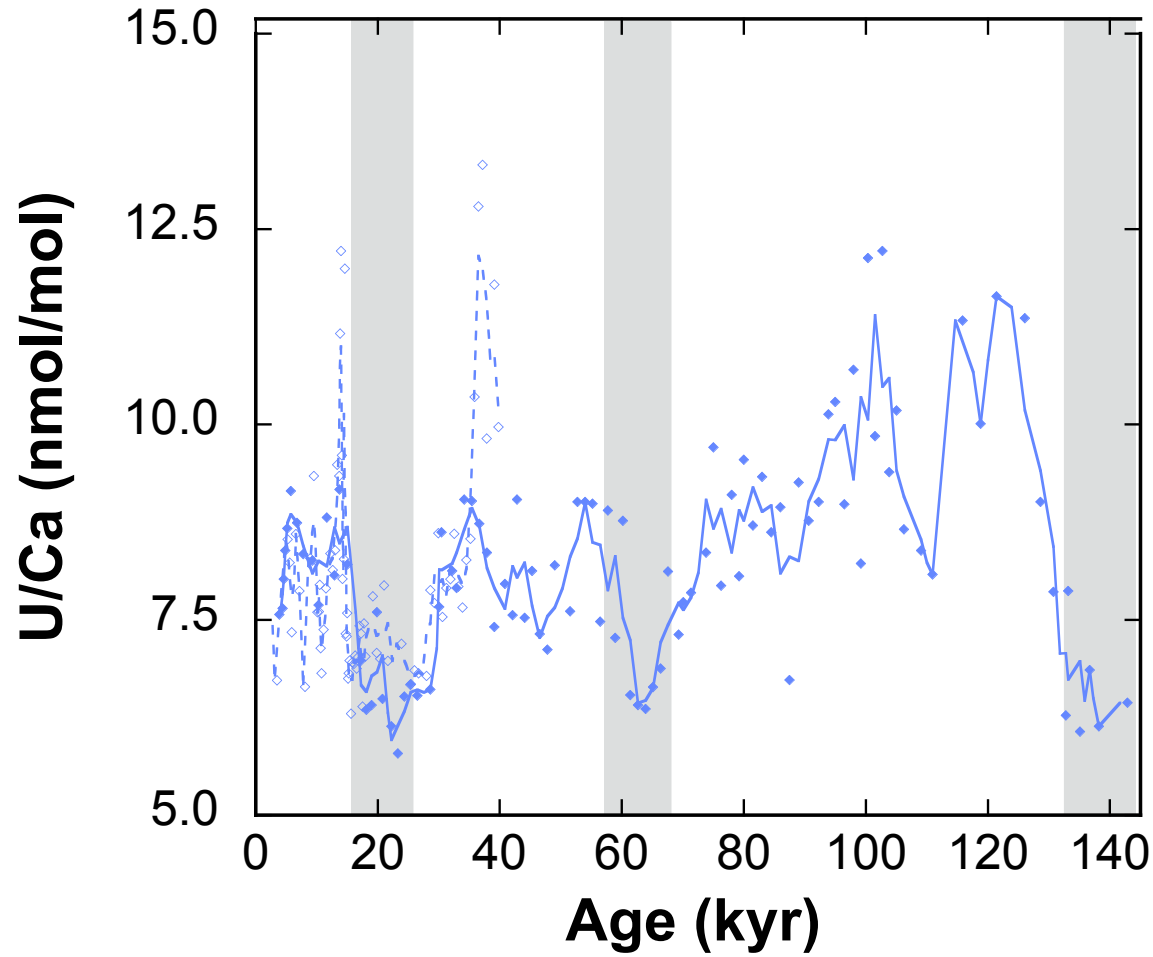
# Collaborators, postdocs, and students

- Tessa Hill
- Brian Gaylord
- Eric Sanford
- Michael Kennedy
- Jennifer Fehrenbacher
- Barbel Hoenisch, LDEO
- Steve Eggins, ANU
- Howie Spero
- Kate Davis
- Ted Grosholz
- John Largier
- Adina Paytan, UCSC
- Alex Gagnon, UW
- Steve Doo
- Edward Chu

# Research foci

- Developing geochemical tools for reconstructing past ocean parameters (temperature, salinity, pH, upwelling strength)
- Understanding the controls and time scales over which modern ocean and estuarine chemistry varies

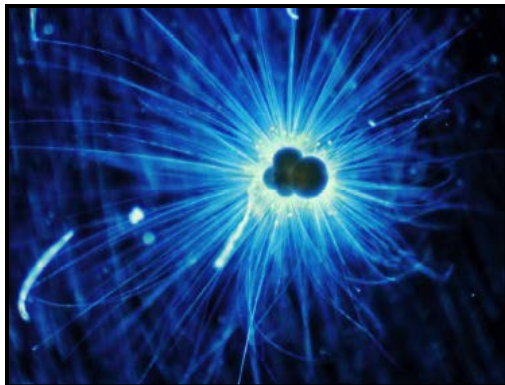
*Developing geochemical tools for reconstructing past ocean parameters: U/Ca as pH proxy*



# Relating shell geochemistry to ocean conditions: experiments with living forams



*Juvenile O. universa*



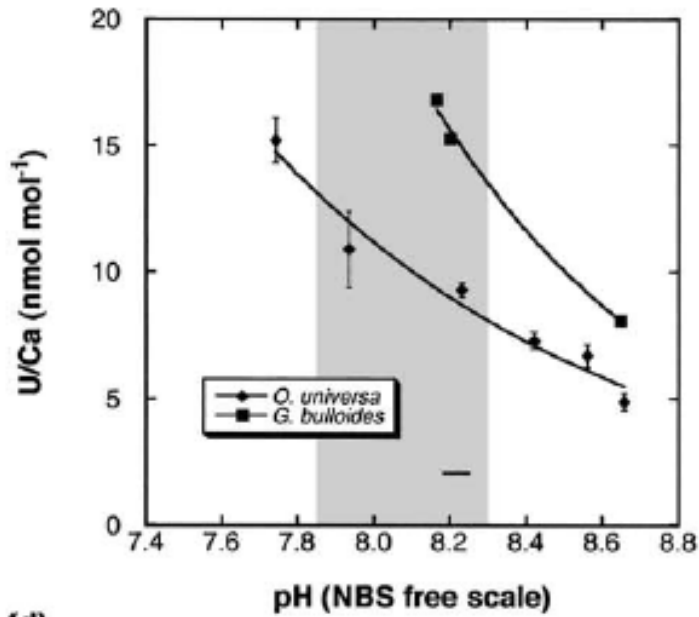
*G. bulloides*



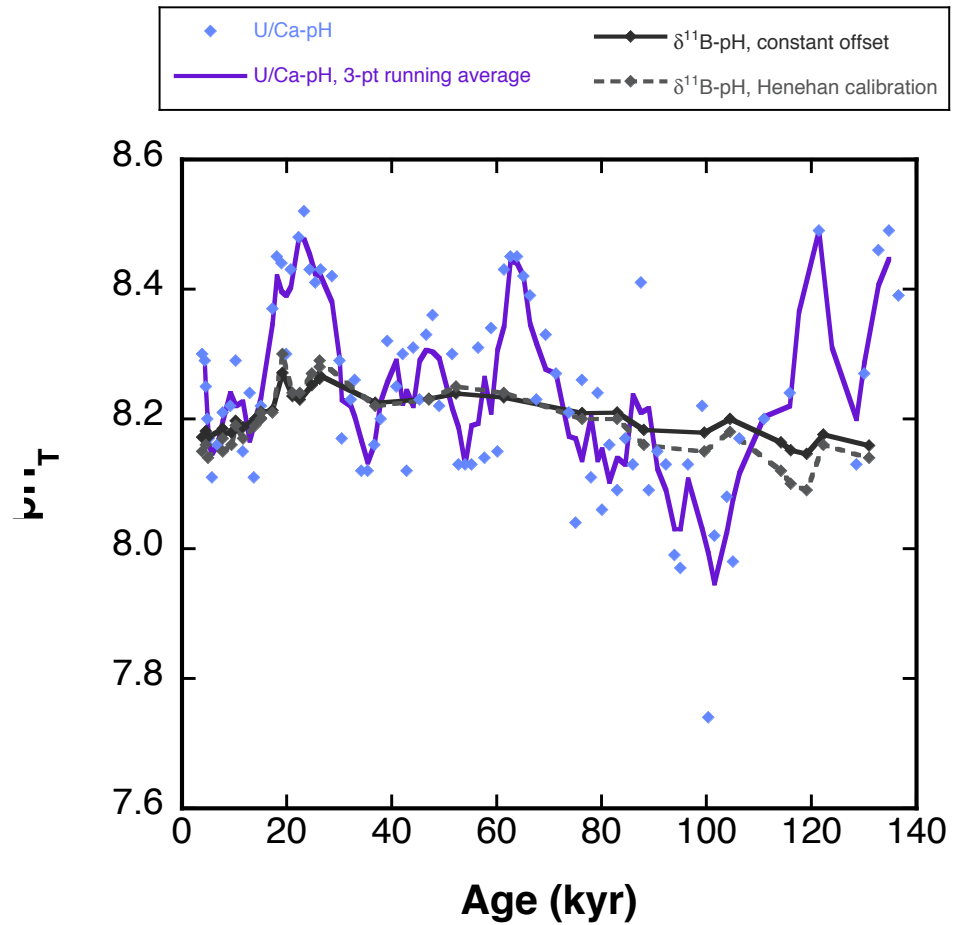
Photos courtesy of H. Spero; movie by S. Doo

Developing geochemical tools for reconstructing past ocean parameters: U/Ca as pH proxy

(b)



(d)

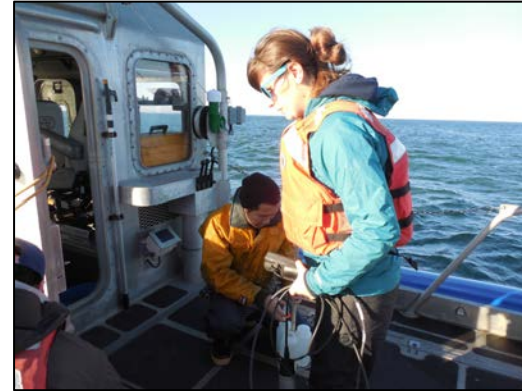


# Current research focuses on non-spinose forams

*Tessa Hill, Jenn Fehrenbacher, Kate Davis, Edward Chu*



J. Fehrenbacher & K. Davis deploy plankton net off Catalina Island, August 2014



K. Davis off Bodega, January 2014



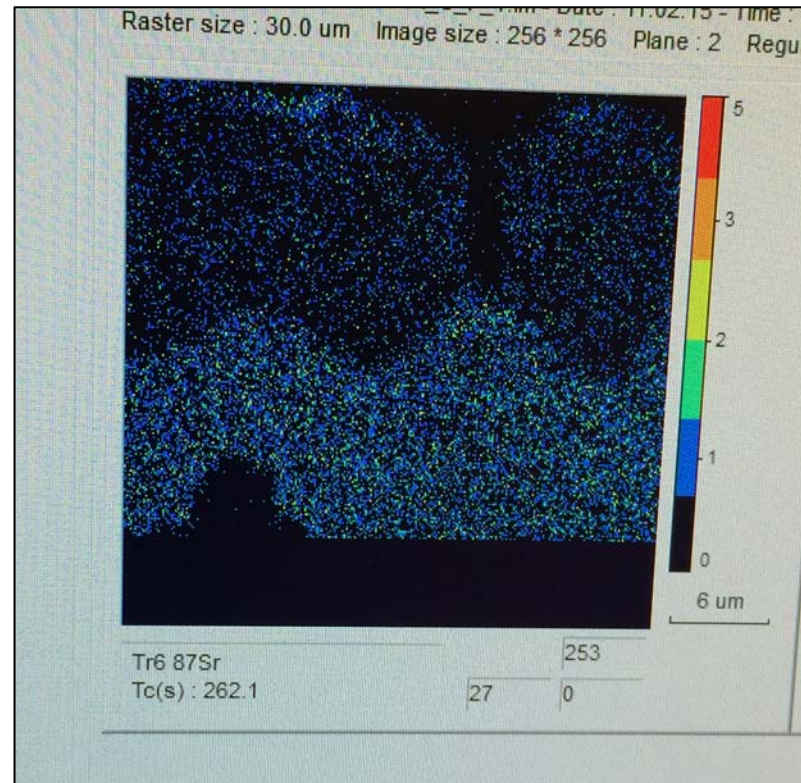
E. Chu & T. Bergamaschi examine CTD data off Catalina, Aug 2014



# Developing Mg/Ca as paleothermometer for thermocline reconstructions



*N. dutertrei* with *Artemia* nauplius



$^{87}\text{Sr}$  label in culture water allows us to identify calcite grown under culture conditions – *even when no new chamber forms*



# Other research

- Using coupled radiocarbon in charcoal and mussel calcite from archaeological middens to reconstruct changes in upwelling intensity (*Kennedy, Bettinger*)
- Examining scales of intertidal pH variability along the Oregon-California coast (*Hill, Gaylord, Sanford*)
- Teasing apart the relative contributions of terrestrial versus marine influences on estuarine acidification in Tomales Bay (*Grosholz, Largier, Hill*)



*Catalina 2014 crew celebrates the end of a successful culture season*

**Let's talk!**