

Marine Chemistry (SIOG 260), Winter Quarter 2018

Instructors: **Kathy Barbeau** (Sverdrup Hall 3119, x24339, kbarbeau@ucsd.edu),
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TA: **Alyssa Finlay**, afinlay@ucsd.edu

Meeting Time and Place: **MWF, 11-11:50**. Vaughan Hall, 100

Requirements: Grades will be based on homework and projects (50%), and two take-home exams (25% each).

Primary text: Emerson and Hedges: *Chemical Oceanography and the Marine Carbon Cycle* (Cambridge University Press). Available in various formats on Amazon.com.

Additional useful texts: Millero, *Chemical Oceanography, 4thEd.*
Pilson, *An Introduction to the Chemistry of the Sea*
Pankow, *Aquatic Chemistry Concepts*
Broecker and Peng, *Tracers in the Sea*
Chester, *Marine Geochemistry*
Sarmiento and Gruber, *Ocean biogeochemical dynamics*

Course website on TritonEd: pdf versions of each lecture will be posted on the course website after each lecture. Homework sets, homework answers, and additional materials will be posted as necessary.

Weekly TA-led problem sessions: TBD

Jan 8 (mon) – Course overview and general chemical concepts (Martz & Barbeau)	
Seawater Composition and Chemistry - Martz	
Jan 10 (wed)	Residence time/circulation
Jan 12 (fri)	Geochemical cycles – weathering, rivers
Jan 15 (mon)	<i>MLK Holiday</i>
Jan 17 (wed)	Geochemical cycles – hydrothermal vents
Jan 19 (fri)	Salinity/physical properties
Jan 22 (mon)	Thermodynamics Background I
Jan 24 (wed)	Thermodynamics Background II
Jan 26 (fri)	Acid-Base equilibria
Jan 29 (mon)	Ocean CO ₂ system
Jan 31 (wed)	Anthropogenic CO ₂
Feb 2 (fri)	Calcite and opal
Feb 5 (mon)	Gases in the ocean
Feb 7 (wed)	Kinetics
Feb 9 (fri)	Carbon cycle
Feb 12 (mon) – Review and transition (Martz and Barbeau)	
Biogeochemical Cycles - Barbeau	
Feb 14 (wed)	Tracers I
Feb 16 (fri)	Tracers II
Feb 19 (mon)	<i>Presidents' Day Holiday</i>
Feb 21 (wed)	Tracers III
Feb 23 (fri)	Production
Feb 26 (mon)	Respiration
Feb 28 (wed)	Nutrients, Redfield
Mar 2 (fri)	Macronutrient cycles
Mar 5 (mon)	Micronutrients
Mar 7 (wed)	Trace element geochemistry
Mar 9 (fri)	Organic geochemistry
Mar 12 (mon)	Sediment diagenesis
Mar 14 (wed)	Sedimentary record
Mar 16 (fri)	Anthropogenic impacts on biogeochemical cycles