Background

• B.S. in Geological Sciences, B.A. in German (2005)
• Fulbright Fellowship to Germany (2005-2006)
• PhD in Geological Sciences (2006-2011)
• PDRA, then NERC IRF
Pathway to my NERC fellowship

- **PhD**: Geology, sedimentology, carbonate chemistry, geobiology
  - Identified a possible new carbon sink
- **PDRA**: Numerical modelling of palaeoclimate/biogeochemical cycling
- **Fellowship**: Builds on topics from my PhD work using skills developed in my PDRA
  - Helped demonstrate ownership of the project
A subseafloor carbonate factory across the Triassic-Jurassic transition

Sarah E. Greene¹,², David J. Bottjer¹, Frank A. Corsetti¹, William M. Berelson¹, and John-Paul Zonneveld³

2013

**Authigenic Carbonate and the History of the Global Carbon Cycle**

Daniel P. Schrag et al.
*Science* **339**, 540 (2013);
DOI: 10.1126/science.1229578

**Carbon Cycle Makeover**

Donald E. Canfield and Lee R. Kump
*Science* **339**, 533 (2013);
DOI: 10.1126/science.1231981

2014

**Significant contribution of authigenic carbonate to marine carbon burial**

Xiaole Sun* and Alexandra V. Turchyn

Plus many more . . .
Motivating Questions

1. Why does it form?
   – A new class of paleoenvironmental proxy

2. Significance of the authigenic carbon sink for global carbon cycling
   – A multi-model approach to assess sink size over geologic time
Marine sediments are alive

<table>
<thead>
<tr>
<th>Organic matter content/quality</th>
<th>Porewater Geochemical Zonation</th>
<th>Primary Redox Reaction</th>
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<tr>
<td>Methanic</td>
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<td>Methanogenesis</td>
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<td>Sulfidic</td>
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<td>Oxic Nitrogenous</td>
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<td></td>
<td>$O_2$, $NO_3^-$, $Mn^{2+}$, $Fe^{2+}$</td>
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<td>$SO_4^{2-}$, $H_2S$, $CH_4$</td>
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</table>

- Aerobic respiration
- Denitrification
- $Mn^{4+}$ reduction
- $Fe^{3+}$ reduction
- $SO_4^{2-}$ reduction
- Methanogenesis
Model approach
Stuff I was told or wish I knew when preparing my application

- Seek help/advice early and often
  - Read past (successful) fellowship applications
  - Members of staff here serve(d) on selection panels. Pick their brains!
  - No – you aren’t bothering us - it is in our best interest for you to succeed!
  - Do a mock interview. It will suck but you will thank yourself later.
Stuff I was told or wish I knew when preparing my application

• Project scope: think BIG
  – Grand new challenge with far-reaching implications, not a series of incremental papers
  – Should be clear from your application that this is your project and you have the skills to do it
Stuff I was told or wish I knew when preparing my application

• Consider host institution choice VERY carefully
  – Same place as UG/PhD/Postdoc? Need to make a strong case
  – Guaranteed lectureship?
Stuff I was told or wish I knew when preparing my application

- Application should convey that you are a future leader in your field and you are ready to be a PI
  - Find your ‘inner American’
  - NERC is funding a fellow as much as they are funding a fellowship project
Stuff I was told or wish I knew when preparing my application

• Apply early and apply often*
  – “I need to spend a year beefing up my CV” (I’ve seen people land NERC fellowships straight out of PhD)
  – “I just don’t have a good enough idea yet” (Waiting a year probably won’t solve this. What *will* solve this is lots of reading/draft writing/conversations with prospective collaborators
  – Even if you don’t end up submitting this year, 2018 you will thank 2017 you when he/she doesn’t start with a blank sheet of paper

*until/unless NERC caps the number of times you can apply . . .
Stuff I was told or wish I knew when preparing my application

- Success/failure of a fellowship application is a poor reflection of your worth as a researcher
  - Once you’ve cleared the ‘laughability’ hurdle, getting to interview is part idea, part writing, part track record and HUGELY luck of the draw
  - Most people apply multiple times before success
Stuff I was told or wish I knew when preparing my application

• Start yesterday
  – Brainstorming, writing, developing network of contacts