

Draft Minutes for the 1574th meeting of the Geological Society of Washington

February 2, 2022

Video Conference via Zoom

President Larry Meinert called the meeting to order at 20:01 EST. Larry said that largely due to enhanced security protocols for many email services, recent GSW meeting announcements containing Zoom links were routed to SPAM folders or blocked entirely. He asked members to check their SPAM folder and email him directly if they do not receive meeting announcements. He confirmed that announcements are sent out one week in advance and that the GSW website remains a reliable source for up-to-date information.

Attendance

There were 48 attendees.

Minutes

The meeting began with the approval of the minutes from the previous meeting (1573rd). The minutes of the 1573rd meeting had been posted online and a Minute's Minute was read aloud at the 1574th meeting. No corrections were noted, and the minutes were accepted.

New Members and Guests

Four new members were announced: Mary Croke (GMU), Liam Peterson (UMD), Kristopher McCandless (Virginia Dept. of Environmental Quality) and Stewart Edie (NMNH).

One guest was introduced: Sarah Christianson.

Announcements

1. Kori Newman displayed the dates of the 2022 regional science fairs along with her contact information. She asked anyone interested in judging to email her and requested that organizations send their leftover swag her way. All fairs will be virtual, and judging will involve viewing entrants' YouTube videos. Kori said that she hopes top winners can present their posters at the last GSW meeting of the year. Larry Meinert thanked Kori for the great job that she continues to do in educating people about earth science.

2. Liz Cottrell asked members to consider stepping into the outreach coordinator position when Kori leaves this post to take on a greater leadership role at GSW.

Informal Communication

Kadie Bennis of the Smithsonian's Global Volcanism Program gave a brief overview of the recent Hunga Tonga–Hunga Ha'apai volcanic eruption. She shared before and after satellite images, plume dimensions and recent eruptive history. The explosion forced tsunami evacuations around six different areas of Tonga and the sound that resulted was heard across several distant neighboring countries including Fiji and New Zealand, as well as in the state of Alaska. Bennis closed with a recording of the blast taken by a Ring Video doorbell at an Anchorage residence.

Obituaries

No obituaries were announced.

Formal Program

The formal program commenced at 20:16 EST and consisted of three speakers: Dr. Jaime Barnes (University of Texas at Austin), Dr. Brent Goehring (Tulane University) and Dr. Miquela Ingalls (Penn State University).

Jaime Barnes presented “The Role of the Sub-Continental Lithospheric Mantle in Halogen Cycling through Subduction Zones.” Barnes stated that halogens (Cl, F, Br, I) are highly fluid-mobile elements and that their incompatibility in minerals limits modification by fluid-rock interaction thereby making them reliable tracers of fluid source. Due to their hydrophilic nature, elemental ratios as well as the isotopes of chlorine have been used as a fluid tracer in subduction zones or to trace recycled crustal material into the upper mantle. Recent work has focused on defining the elemental concentration and isotopic composition of inputs (e.g., sediments, altered oceanic crust, serpentinites) into the subduction zone, as well as, outputs from the volcanic front (e.g., gases, lava, melt inclusions). Although the cycling of halogens (primarily Cl and F) through the arc volcanic front is now reasonably well understood, their overall budgets remain uncertain. Additional output pathways are likely but to date have been poorly quantified. Jaime said that four possible, yet largely unquantified outputs/reservoirs are: 1) loss through or sequestration in the forearc via cold and thermal spring systems; 2) sequestration in the crust due to magma ponding; 3) deeply subducted residue and input into the deep mantle, and 4) sequestration in the sub-continental lithospheric mantle (SCLM). She presented ongoing work to characterize the halogen budget of the SCLM. In particular, SCLM that has been metasomatized by slab-derived fluids may have high concentrations of halogens compared to typical depleted upper mantle due to enrichment of halogens in slab-derived fluids. She reported bulk rock halogen concentrations (F, Cl, Br, I) in mantle xenoliths from the southwestern United States to constrain the effects of metasomatism from slab-derived fluids of the subducting Farallon slab on halogen abundances. *Talk Length: 20' 05"*

Questions were asked by: Liz Cottrell (NMNH), Mike Purucker (NASA), George Helz (UMD) and Steve Shirey (Carnegie Institution).

Brent Goehring presented “Holocene Glacier Length Variations Along the Spine of the American Cordilleras: Confirming Hypotheses and Worrisome Trends.” Goehring presented new results showing that glaciers in the North and South America are experiencing retreat beyond anything seen in at least the last 10,000 years. This fact sheds light on the sensitivity of glaciers to future climate change over a wide range of latitudes, elevations, sizes, and climatic regimes. He shared measurements of the cosmogenic nuclides carbon-14 and beryllium-10 from rock only recently exposed by retreating glaciers. Brent said that this study is the result of samples drawn from crowdsourcing and the data represents the work of three fantastic master's students. *Talk Length: 21' 09"*

Questions were asked by: Larry Meinert (Economic Geology & CSM), Liz Cottrell (NMNH), Mike Purucker (NASA) and Bill Burton (USGS-Emeritus).

Miquela Ingalls presented “Carbonate-associated Phosphate as a Proxy for Nutrient Availability for Early Life” Ingalls opened her talk by establishing that phosphorus (P), an essential element for life processes is currently negligible in the surface oceans and exists in very low concentrations in the deep oceans and thus, is the primary limitation on net primary productivity (NPP). This circumstance sets up the paradox of why P plays a key role in the structures and processes of cell biology. Were P concentrations higher in the Archean oceans early in the evolutionary history of cell biology? Miquela compared P concentrations in shallow marine carbonates from the Neoproterozoic (2.8 to 2.5 Ga) and the Phanerozoic (<550 Ma). She reported that primary carbonate structures and fabrics from the Neoproterozoic yield significantly higher P concentrations than those that formed during the Phanerozoic and interprets this to mean that Archean seawater was more enriched in P than modern oceans and thus P was not the primary limitation on NPP. *Talk Length: 20' 55"*

Questions were asked by: George Helz (UMD), Mike Ackerson (NMNH), Bill Burton (USGS-Emeritus) and Larry Meinert (Economic Geology & CSM).

President Meinert announced that the next meeting on February 23rd, is currently set as in-person at the Cosmos Club. All attendees are required to show proof of vaccination. He then adjourned the 1574th meeting at 21:47 EST.

Respectfully submitted,

Beth Doyle