

Draft Minutes for the 1590th meeting of the Geological Society of Washington
May 3, 2023
Cosmos Club

President Kori Newman called the meeting to order at 20:00 EDT.

Attendance

There were 30 attendees.

Minutes

The meeting began with the approval of the minutes from the previous meeting (1589th). The minutes of the 1589th meeting had been posted online and a Minute's Minute was read aloud at the 1590th meeting. No corrections were noted, and the minutes were accepted.

Guests and New Members

No new members were announced.

Six guests were introduced: Olivia Cozette (High School science fair winner), Keaton van Bareren (mother of Olivia), Walter Clark (NOAA), Adam Smith, Tom Neumann (NASA GSFC), Michael Croteau (NASA GSFC)

Announcements

Two announcements were made. President Newman announced the winner of the GSW science fair award and presented her with a fine rock specimen from collection. Secretary Lederer announced a vacancy this fall for Meeting Secretary – interested parties may contact him directly.

Obituaries

No obituaries were read.

Informal Communication

No informal communications were read.

Formal Program

The formal program commenced at 20:12 EDT and consisted of three speakers: Walt Clark, U.S. National Ice Center; Michael J Croteau, NASA Goddard Space Flight Center; and Tom Neumann, NASA Goddard Space Flight Center.

Walt Clark presented “Using Geophysical Environmental data to support operations in Sea & Lake Ice.” The United States National Ice Center provides information and services that enable economic activity, naval operations, and ship-borne navigation in the oceans as well as the Great Lakes and Chesapeake Bay. Using satellite data and imagery, including passive microwave, visible, infrared, and synthetic aperture radar (SAR) instrumentation allows for imaging of polar regions. SAR provides surface roughness, which can be interpreted as a proxy for ice thickness. For example, when imagery showed thicker ice in the southern part of Lake Erie ships could be routed north to save time and reduce the need for a Coast Guard icebreaker escort. Other case studies include polar ice monitoring, coupled modeling, ice thickness forecasts, and taconite and coal transportation in the Great Lakes.

Talk length: 22 minutes.

Questions were asked by: Mong-Han Huang, UMD; Larry Meinert, USGS (retired); Graham Lederer, USGS; Michael Purucker, Nasa Goddard; and Beth Doyle, NVCC

Mike Croteau presented “Weighing the Cryosphere and monitoring its changes with the GRACE Follow-On satellite mission.” Earth’s gravity field changes through time as well as spatially, with highs observed in ice covered mountains. The Gravity Recovery and Climate Experiment (GRACE) and follow-on missions involve a pair of satellites in synchronous orbit. As the lead satellite passes a gravity high, it accelerates, and the distance between the two is measured very precisely (e.g. microns over 100s of kilometers). The data series, beginning in 2002, provides a monthly snapshot of Earth’s gravity field at a resolution appropriate for observing basin-scale processes acting on the hydrosphere, cryosphere, and solid earth. For example, estimates from GRACE data show that Greenland is losing 266 Gt of ice per year while Antarctica is losing 150 Gt/y with potential for catastrophic loss of 1000 Gt per year if West Antarctica Ice Sheet melts. The GRACE missions provide the data needed to effectively “weigh” the ice sheets and quantify their contributions to global sea level rise.

Talk length: 20 minutes.

Questions were asked by: Ved Lekic, UMD; Olivia Cozette, High School science fair winner; Mong-Han Huang, UMD; Jonathan Tucker, NAS; Larry Meinert, USGS (retired); Michael Purucker, Nasa Goddard; Greg Neumann, NASA Goddard; Sam Scher, LKI Consulting

Tom Neumann presented “Measuring our changing Cryosphere one photon at a time.”

ICESat-2 uses lasers to measure distances and angles from space to Earth. The three-beams of green 532 nm-wavelength lasers have a footprint of 11 m spaced 70 cm apart. Measuring the 2-way travel time of photons reveals thick surfaces of returns which coincide with the land surface, water surface, bathymetry, and tree canopy heights. Two example applications were measuring the change in height through time of the ice sheet in Antarctica, as well as the height of sea ice above the water line.

Talk length: 20 minutes.

Questions were asked by: Mong-Han Huang, UMD; Mike Weber, University of Bohn; Ved Lekic, UMD; Graham Lederer, USGS, Sam Scher, LKI Consulting; Jonathan Tucker, NAS; Michael Purucker, NASA Goddard; Greg Neumann, NASA Goddard; Mike Croteau, NASA Goddard; Larry Meinert, USGS (retired); Kori Newman, STR.

President Newman adjourned the meeting at 21:50 EDT.

Respectfully submitted,

Graham Lederer