

## February 2018 News Notes

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- Alumni Change Lives
- Faculty Research Lecture Series: Journey of a Marine Scientist
- OSU Scientists Combat Climate Change: ABC6 News Story
- John Mercer Predicted Ice-Sheet Collapse 50 Years Ago
- New SES paper on North American snow climatology
- Donuts with the Dean

### Alumni Change Lives

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*Melissa Wrzesien is a PhD student working with Dr. Michael Durand. Here she describes how the Friends of Orton Hall fund helped further her graduate studies. If you are interested in giving to support the Friends of Orton Hall or other funds, please visit our giving page ([link](#)).*



Friends of Orton Hall funded two conference trips for me during 2017. First, in February, I attended the International Symposium on the Cryosphere in a Changing Climate in Wellington, New Zealand. This conference presented me with several great opportunities. First, I was able to present the main portion of my dissertation research for the first time. I have created a new estimate of North American mountain snow accumulation from a high resolution regional climate model. Our previous work suggests that current global data products underestimate mountain snow, perhaps by as much as 60%. We believe our new climatology presents a more reasonable estimate of how much snow accumulates in the mountains every winter. A cryosphere-centric conference allowed me to present my work to other snow researchers and receive their feedback. I was also able to meet many scientists that do not typically attend conferences in the US/Canada. Perhaps the best part of the conference were the sponsored field trips to different parts of New Zealand. With other conference attendees, I got to hike the Tongariro Crossing on the North Island and visit Aoraki National Park on the South Island. Not only were the sights incredible, it was fantastic to spend the additional time with colleagues, discussing the glaciology of New Zealand while we hiked.

I also received funding to partially support my travel to the AGU annual meeting in New Orleans in December. I gave a presentation on reassessing the water budgets for major North American watersheds, in light of the new mountain snow climatology dataset. We compare several global precipitation estimates to values from our regional climate model. Since few observations are available in high latitude watersheds, like the Yukon River basin, we find that gridded datasets based on extrapolating observations over complex terrain often perform more poorly than models. Attending AGU provided me the chance to meet with collaborators and to discuss future projects. I am very thankful to the Friend of Orton Hall fund for helping me to attend both of these conference opportunities.

## Faculty Research Lecture Series: Journey of a Marine Scientist

Ohio State ADVANCE launched a new faculty research lecture series focusing on the research journey of Ohio State faculty. Each lecture will feature the research of an invited faculty speaker. Speakers will also share their own research journey as a way to highlight both the challenges and successes that are part of the research process. The mission of Ohio State ADVANCE is to increase the representation, advancement and recruitment of women faculty in the academic STEMM (Science, Technology, Engineering, Mathematics and Medicine) careers, and contribute to the development and success of global research leaders.

Prof Andrea Grottoli from SES recently participated in this lecture series. Her lecture took place on February 26th. Grottoli described her team's work in three areas of research: 1- determining what drives resilience in corals in the face of climate change, 2- reconstructing oceanographic conditions in the past based on coral skeletal isotope and trace metal records, and 3- the impact of land-use on the delivery of carbon to small tropical and temperate rivers. Congratulations, Prof Grottoli!



## OSU Scientists Combat Climate Change: ABC6 News Story



ABC6 News released a story this month on Drs. Lonnie and Ellen Thompson and their library of ice core samples. The library holds 40 years worth of ice samples that the Thompsons have made a mission of obtaining. They hope they will be used to examine how climate change has affected civilizations in the past and help to predict the future effects of climate change on our planet.

See the full story here: [link](#).

# John Mercer Predicted Ice-Sheet Collapse 50 Years Ago

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*Nature* published a great editorial piece on the (then) Institute of Polar Studies' John Mercer and his prescience with regards to Antarctica's stability (or lack thereof). From the story:

Mercer first warned about the potential for rapid sea-level rise from melting ice caps. His landmark 1968 paper drew on fieldwork at the Reedy Glacier, which feeds into West Antarctica's Ross Sea. Many credit a 1974 paper by Johannes Weertman, a geophysicist at Northwestern University, with providing a technical explanation for how such a massive ice sheet could disintegrate. The late Bob Thomas, a NASA glaciologist, spent years investigating and explaining how floating ice shelves acted as corks, stemming the flow of land-bound glaciers into the sea. But Mercer still deserves credit for sounding the alarm. In a 1978 paper in *Nature*, Mercer updated his arguments in clear and elegant terms. Read the full story here: [link](#).

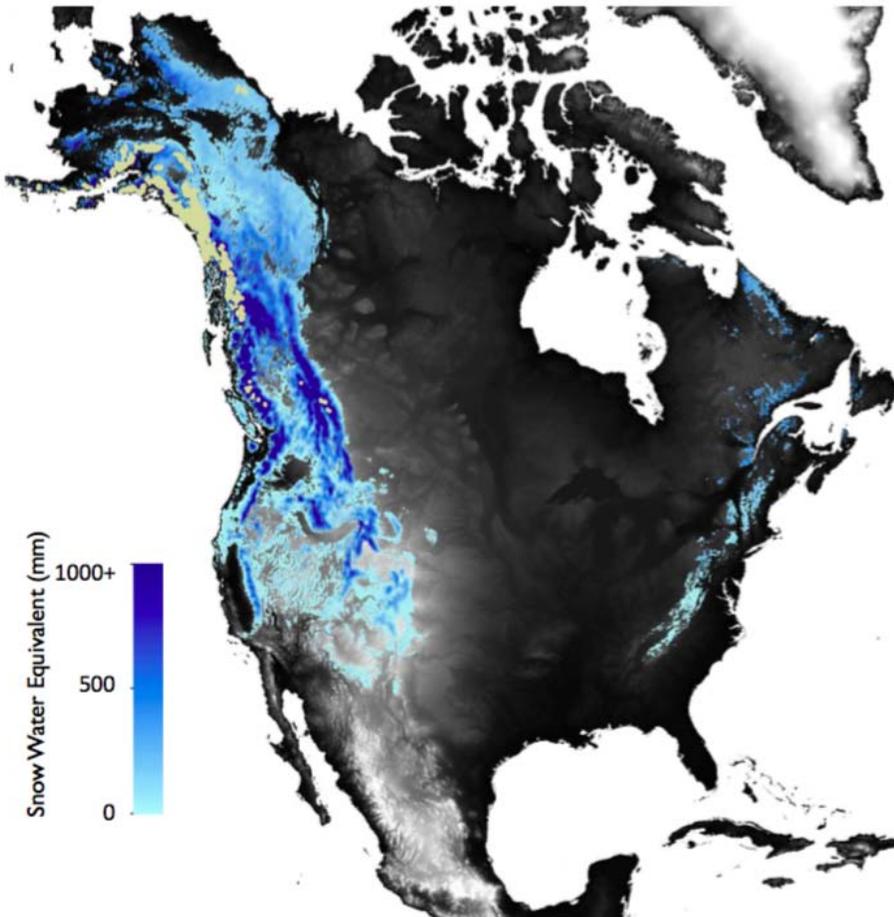
## New SES paper on North American snow climatology

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Melissa Wrzesien is a student in Prof Durand's lab; she was also featured in the "Alumni Change Lives" column this month. Melissa and Prof Durand teamed up with Prof Shum, Dr. Junyi Guo and Yu Zhang from Geodesy on a paper that's out in *GRL*, this month:

Wrzesien, M. L., M. T. Durand, T. M. Pavelsky, S. B. Kapnick, Y. Zhang, J. Guo, and C. K. Shum (2018), A New Estimate of North American Mountain Snow Accumulation From Regional Climate Model Simulations, *Geophys. Res. Lett.*, 118(14-15), 7489–10, doi:10.1002/2017GL076664 ([link](#)).

Despite the importance of mountain snowpack to understanding the water and energy cycles in North America's montane regions, no reliable mountain snow climatology exists for the entire continent. We present a new estimate of mountain snow water equivalent (SWE) for North America from regional climate model simulations. Climatological peak SWE in North America mountains is 1,006 km<sup>3</sup>, 2.94 times larger than previous estimates from reanalyses. By combining this mountain SWE value with the best available global product in nonmountain areas, we estimate peak North America SWE of 1,684 km<sup>3</sup>, 55% greater than previous estimates.



Though mountains comprise 24% of the continent's land area, we estimate that they contain ~60% of North American SWE. This new estimate is a suitable benchmark for continental- and global-scale water and energy budget studies.

The figure shows peak SWE on a range-by-range basis; the tan color indicates glaciers.

## Donuts With the Dean



Even though the Dean's donuts disappeared in 3 minutes, undergraduate Zach Miculka (Earth System Science subspecialty, BS expected Spring 2019) still got to meet and shake the hands of Arts and Sciences Executive Dean David Mandersheid in the entryway of Mendenhall Laboratory on February 21, 2018 during one of the always fun Donuts with the Dean events.