YOPP-SH Meeting on Forecasting of the Extreme Antarctic Warming Event

Wed 30 Mar 2022, 2100 UTC – 2230 UTC

Attendees:

Present: David Bromwich, Jeff Wilson, Blake Murray, Matthew Lazzara, Scott Carpentier, Seong-Joong Kim, Inga Smith, Jonathan Wille, Simon Alexander, Xun Zou, Jun Inoue, Arthur Cayette, Taylor Norton, Catherine, Sergi Gonzalez, Irina Gorodetskaya, Vito Vitale, Stefano Di Battisa, Matt Mazloff, Jan Lieser (Hobart), Penny Rowe, Victoria Heinrich, Ethan Koudelka, Jorge Carrasco, Taejin Chol.

Apologies: Daniela Liggett

Based on notes collected by Jeff Wilson and Blake Murray.

If you would like to view the video for this session, please email Dave Bromwich to request the link.

Discussion of the March 2022 Extreme Warming Event and Its Forecasting

Jonathan Wille

This event broke all records for the warmest event at Concordia station, Dome C AWS recorded -10.1°C on 18 Mar. Noted the complex circulation and the atmospheric river that extended from SE Australia to East Antarctica with a strong (6 sigma) blocking high over the continent. Strong height anomalies in the 500 hPa contours as well as in the wind.

Jonathan talked about how the collapse of the Conger ice shelf could have been affected by the atmospheric river based on the increased winds it brought. A consensus was made to keep the atmospheric river and collapse of ice shelf as separate events. Jan Lieser (Hobart) noted that the ice shelf collapse was not due to the atmospheric river heat impact. The wave action may have helped to push out the bergs. Jan thinks the ice shelf broke off first due to a low near Casey a few days earlier. Art noted that the number of depressions may have caused a sea level change. Similar thing happened at the Amery Ice Shelf some years ago. Scott noted that Casey records Sea Level data so the theory could be tested.

An overview paper on the event has been started , and already has 25+ contributors, https://docs.google.com/document/d/1vzbQBFMRKtx6uPNHkUudwvevpOVpajB-K8a11AhJqkU/edit?usp=sharing

Matthew Lazzara

Reviewed various plots and also debuted animation of the cloud mass that extended over Antarctica. Matthew explained more about cloud mass transports which happened here and are a superset of atmospheric rivers. Showed observations from Dome C AWS, also noted to beware of the rising barometer. Wind speeds of 5 to 10 m/s.

AWSs on a transect from Dumont D'Urville to Dome C: the rise in temperature was not so marked at the lower elevations, much more marked at higher elevations. AGO5 AWS not working.

Dome C -10.2 Vostok -17.7 Concordia perhaps -10.1C

Arthur Cayette

AMPS model handled the event well and was a good representation at +120 hours. This event was easy to spot but future subtle events may be harder to clearly spot based on models.

Art will push out his forecasts twice a week on Monday and Thursday. These are posted on the page managed by Matthew and can be found here: https://amrc.ssec.wisc.edu/data/yopp-sh.html

Discussion on other topics related to the upcoming SOP

Plan was to host an online workshop in late May/early June to look further at this event. Jonathan's paper is so popular that this workshop no longer seems necessary, and the workshop will no longer happen.

What will the TOP have looked like for this event?

This event was longer than the 5-day observation time for a TOP, Dave notes that the five-day lead time is from the peak of the event impacting the area of interest. 3 days prior to the peak start the extra radiosonde ascents. So, the observers are only getting two days heads up rather than five days, which is a short amount of spin up time. At the time of publication, it is unclear the procedures for how to continue a TOP if an event lasts longer than 5 days. The wording will need to be reviewed to be clear if a TOP is called 5 days before the peak of the event or 5 days before the start of the TOP.

Dave notes that there will be a lot of discussion about when to call a TOP and how long it should last. Aim to nominate a start time that is based upon the event but trying to get the two days of notice for the start is really key.

A TOP guide has been distributed to all parties for review and revision.

Art put together a 20-year satellite loop to see how often we get a major intrusion into Antarctica between April and July. Dave asks Jonathan if his atmospheric river climatology gives this information. Jonathan thinks it will be 2 to 3 events but a lot of variability in number. Matthew shows his Cloud Mass Transport (CMT) climatology. Shows perhaps five events a month of 36 hours or less across the whole continent.

Forecasting for the Antarctic Peninsula

Irina advises that her team tested another event recently on 7 Feb and all models looked good, however did not have ARPEGE so she is looking further into this. Sonde availability is being gathered and the SLACK channel for forecast discussion is working out.

Currently a list of all operators is put together for when a TOP is called and gathering of final stations is currently happening (King George, Vernadsky [may be inoperable due to supply issues], and Escudero since Escudero keeps changing). Unsure as to what UTC sonde times are to be used at each station.

Jorge Carrasco notes that the National Weather Service observers at the Chilean Frei station will do the launches. Punta Arenas will also launch additional sondes at 18UTC with normal at 12 UTC. Irina asks

Jorge if collectively could do 4/day on King George Island. Jorge says may be tricky but perhaps 00UTC may be possible.

Taejin Chol will talk with Vito about options for additional launches between the Koreans and the Italians for Jang Bogo station in Terra Nova Bay and then advise David what has been decided.