

# Executive Summary – ARTMIP 2<sup>nd</sup> Workshop, 23-24 April 2018

ARTMIP Co-chairs: Jon Rutz, Christine Shields

ARTMIP Committee: Ruby Leung, Marty Ralph, Michael Wehner



Workshop Participants (left to right):

Jon Rutz (NOAA)

Roger Pierce (NOAA)

Ruby Leung (PNNL)

Phu Nguyen (UC Irvine)

Irina Gorodetskaya (Univ. Aveiro)

Helen Griffith (Univ. Reading)

Christine Shields (NCAR)

Brian Kawzenuk (UCSD)

Alexandre Ramos (Univ. Lisbon)

Marty Ralph (UCSD)

Juan Lora (UCLA)

Gary Geernaert (DOE)

Ashley Payne (Univ. Michigan)

Elizabeth McClenny (UC Davis)

Travis O'Brien (LBNL)

Naomi Goldenson (UCLA)

Daniel Walton (UCLA)

Vitaliy Kurlin (LBNL)

Aneesh Subramanian (UCSD)

Tamara Shulgina (UCSD)

Yang Zhou (Stony Brook Univ.)

Bin Guan (UCLA)

Renu Joesph (DOE)

Michael Wehner (LBNL)

Maximiliano Viale (Univ. Chile)

Paul Ullrich (UC Davis; not pictured)

Swen Brands (Meteogalicia; not pictured)

Anna Wilson (UCSD; not pictured)

***The Atmospheric River Tracking Method Intercomparison Project (ARTMIP) exists to quantify the uncertainty in AR climatology (e.g., frequency, duration, and intensity), precipitation, and related impacts that arise because of different AR tracking methods, and how these AR-related metrics may change in the future. The ARTMIP also aims to provide guidance regarding the advantages and disadvantages of these different AR tracking methods, and which of these methods are best suited to answer certain scientific questions. Finally, the ARTMIP will develop an online repository of data for future use in research.***

## **Meeting Summary**

The ARTMIP participants convened for the 2<sup>nd</sup> ARTMIP Workshop from 23–24 April 2018, in Gaithersburg, MD. Beginning with welcoming remarks by Jon Rutz and self-introduction by the participants, the group then heard from key program managers Renu Joesph (DOE), Gary Geernaert (DOE), and Jennifer Saleem-Arrigo (USGCRP). Renu outlined DOE interest in ARTMIP and requested key deliverables (including a workshop summary) from the meeting.

A series of “big-picture” presentations began with Jon Rutz introducing ARTMIP and workshop-specific goals. Several presenters then discussed various aspects of AR science, including AR reconnaissance by Marty Ralph, modelling ARs and their impacts by Ruby Leung, AR research in the European Community by Alexandre Ramos, and ARs in polar regions by Irina Gorodetskaya. Christine Shields then reviewed the ARTMIP experimental design and program goals as well as gave an update on the Geoscientific Model Development (GMD) paper on this subject.

Jon then gave an overview of the Tier 1 data, which he will lead and begin now that the workshop has concluded. Several individuals already analyzing ARTMIP data also presented their findings: Ashley Payne (duration), Juan Lora (intensity), Mary Ralph (ARDT study findings), and Bin Guan (Gleckler diagram). Swen Brands (European Reanalyses) was not able to present remotely due to technical difficulties, but his presentation is available.

The remainder of Day 1 was focused on group discussions regarding how best to quantify and discuss Tier 1 results (i.e., those pertaining to quantification uncertainties in the current AR climatology based on MERRA v2 reanalysis data from 1980–2017). Similarly, Day 2 was focused on group discussions regarding analyses for Tier 2 (i.e., those analyses requiring other data sets, such as climate model data or additional reanalyses). The afternoon featured breakout groups focusing on metrics and timelines three Tier 2 subjects: high-resolution climate change model runs, CMIP5 climate runs, and historical reanalyses. Prior to these discussions, Christine Shields introduced to Tier 2 activities and updates, focusing on what has been done so far.

The meeting concluded with Ruby Leung and Aneesh Subramanian leading a discussion on emerging needs and opportunities for ARTMIP. Participants agreed that ARTMIP data should be used to inform future observational campaigns and the development of observational metrics, and to improve physical process understanding, modelling and prediction of ARs, as well as the need to engage end-users for AR-related impact studies.

## **Key Goals and Timelines**

The ARTMIP will disseminate results via peer-reviewed publications and presentations at scientific venues. A number of publications are already planned. The first of these, led by Christine Shields, discusses the ARTMIP experimental design, and is currently under review with GMD. Four additional papers will provide overviews of the results from Tier 1 (led by Jon Rutz) and three Tier 2 data sets: high-resolution climate change model runs (led by Ashley Payne), CMIP5 climate runs, and historical reanalyses for comparison to the MERRA v2. Furthermore, at least 8 additional papers were discussed, including topics such as extreme precipitation, ENSO, Polar ARs, measures of internal variability, sensitivity to data set resolution, and more. Lead authors have already been identified for many of these publications.

### **ARTMIP Timeline**

<b>Date</b>	<b>Topic</b>	<b>Comment</b>
May 2018	GMD final revisions	Finish
May 2018	Tier 1 Overview paper	Begin
May 2018 – October 2018	Tier 2 High Res Climate Change catalogues	Complete and turn in catalogues
May 2018 – July 2018	Tier 2 CMIP5 acquire data	Begin, target July
May 2018 – Dec 2018	Tier 2 Reanalysis	Lead assign, start radiosonde comparison, reduce MERRA-2 data, establish timeline
July 2018	Tier 1 Overview paper	Draft
July 2018 – Aug 2018	Tier 2 CMIP5 process data	IVT, IWV, etc.
Sep 2018 – Sep 2019	Tier 2 CMIP6 data	Acquire/process, as available
Oct 2018 – Dec 2018	Tier 2 High Res CC Overview paper	Analysis and draft
Jan 2019 – Jun 2019	Tier 2 CMIP5 catalogues	Complete and turn in catalogues
Jun 2019 – Sep 2019	Tier 2 CMIP5 Overview paper	Draft and submit
Jun 2019 – Dec 2019	Tier 2 CMIP6 catalogues	Complete and turn in catalogues
Sep 2019 – Dec 2019	Tier 2 CMIP5 vs CMIP6	Analysis
Dec 2019 – July 2020	Tier 2 Reanalysis catalogues	Choose products, compute metrics, begin catalogues
Jan 2020	Tier 2 CMIP5 vs 6 Paper	Draft

### **Program Managers in Attendance:**

Renu Joseph (DOE), Gary Geernaert (DOE), Dorothy Koch (DOE), Jennifer Saleem Arrigo (USGCRP), Bradford Johnson (NOAA Affiliate), Bob Vallario (DOE), Jared Entin (NASA), Justin Hnilo (DOE)