



NSF Overview

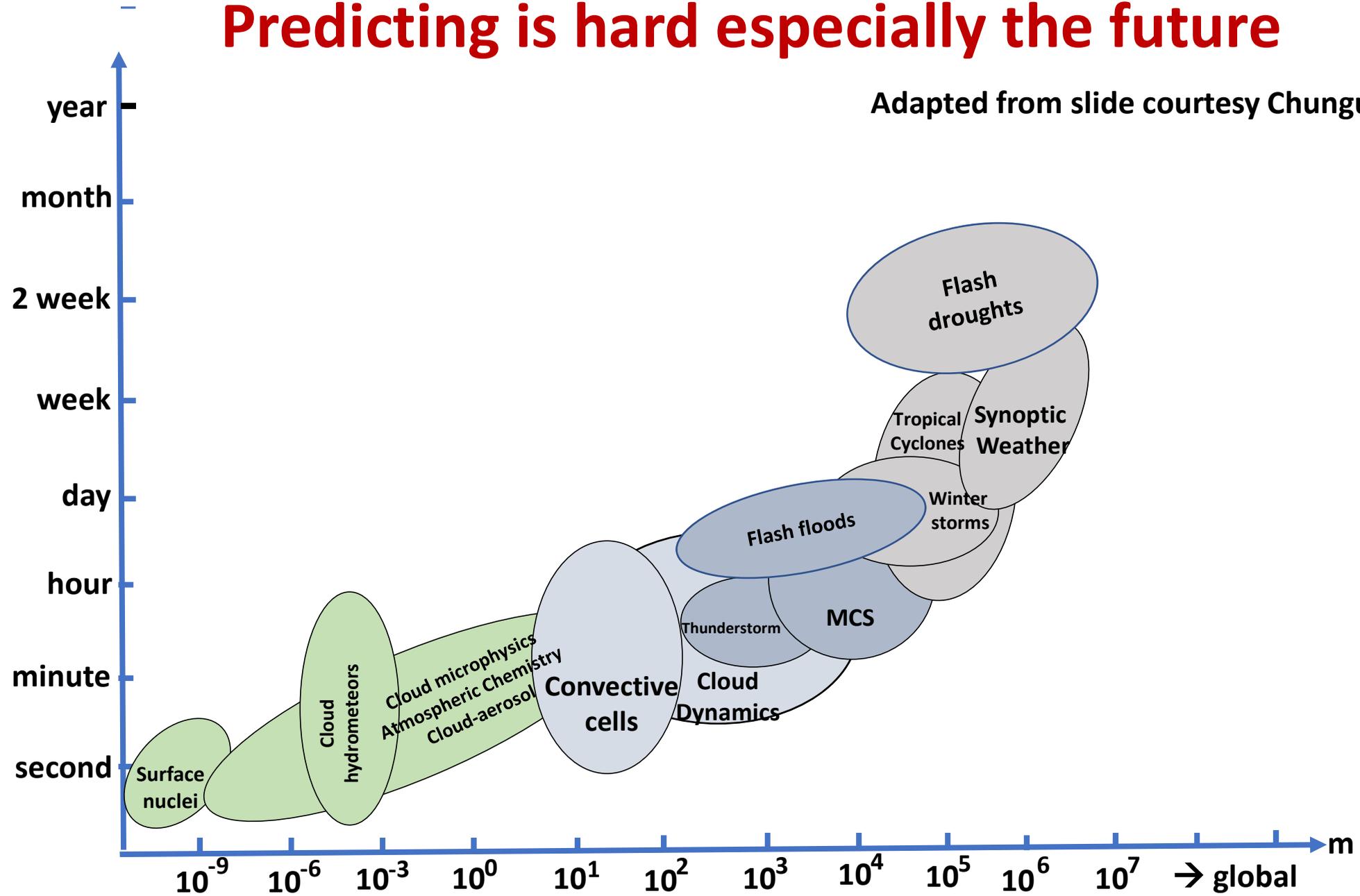
NOAA-DOE Workshop *Precipitation Processes & Predictability*

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Atmospheric and Geospace Sciences
Geosciences Directorate
National Science Foundation**

Nov. 30 - Dec. 2, 2020

Predicting is hard especially the future

Adapted from slide courtesy Chungu Lu, NSF





Sources of Predictability



Deep ocean/GHG/Land use land change, dynamic vegetation

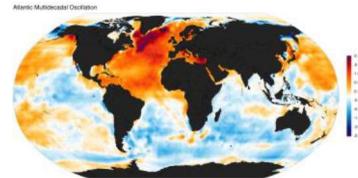
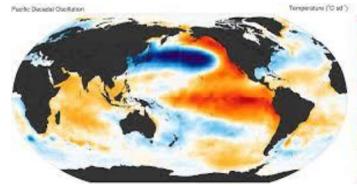
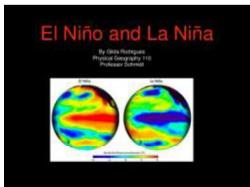
PDV/AMV

ENSO/Sea Ice

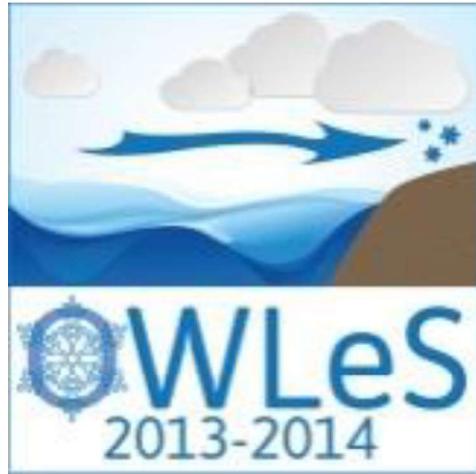
Stratosphere (QBO, SSWs)

MJO/NAO

Soil moisture/Sea ice



Adapted from slide courtesy Jerry Meehl, NCAR



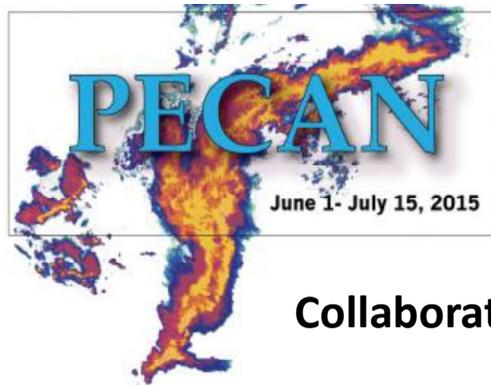
Study of **W**inter **L**ake
effect **S**ystems

Improved Understanding of Precipitation Processes through targeted field observations



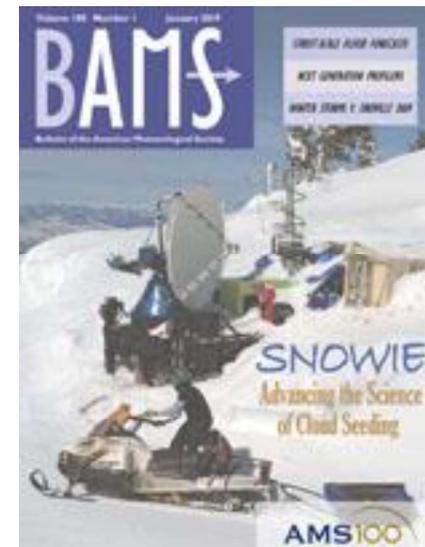
2018
Southern **O**cean **C**louds,
Radiation, **A**erosols **T**ransport
Experimental **S**tudy

Collaboration: DOE, BoM



2015
Plains **E**levated
Convection **a**t **N**ight

Collaboration: DOE, NASA, NOAA



2017
Seeded and **N**atural **O**rographic
Wintertime clouds-the **I**daho
Experiment

Collaboration: Idaho Power Co



RELAMPAGO*



2018-2019; Sierras de Córdoba and near Mendoza, Argentina

GOALS:

- Advance science of heavy rainfall
- Study interactions between complex terrain and severe weather systems.
- Advance partnerships amongst researchers, federal agencies, international organizations.

* Remote sensing of **E**lectrification, **L**ightning, **A**nd **M**esoscale/microscale **P**rocesses with **A**daptive **G**round **O**bservations

Collaborators: DOE CACTI, INPE Brazil, Univ. Buenos Aires Argentina, Univ. of Valparaiso Chile.

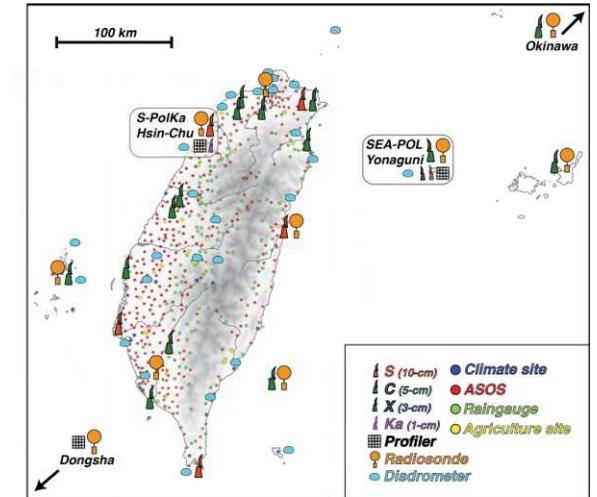




PRECIP*

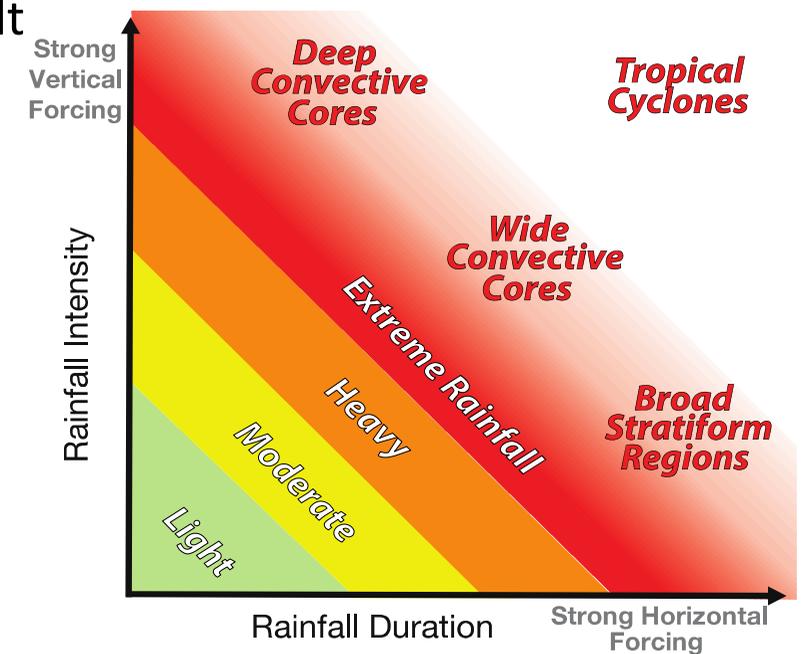
Year/Location: TBD, Taiwan

- Are extreme rainfall events due to fundamentally different physical processes compared to ordinary rainfall events? Or are they just due to stronger forcing and an optimal combination of ingredients?
- What are the most important factors contributing to predictive skill for warm season extreme rainfall? What model improvements, physical parameterizations, or observations and their effective assimilation will result in the largest forecast improvements?



* Prediction of Rainfall Extremes Campaign In the Pacific

Collaboration: NOAA, Taiwan Ministry of Science and Technology; Japan Grant-in-Aid for Scientific Research Tropical cyclones-Pacific Asian Research Campaign for Improvement of Intensity estimations/forecasts (T-PARCII)



http://catalog.eol.ucar.edu/

UCAR NCAR

Closures/Emergencies Location



Development • Deployment • Data • Discovery

EOL Field Catalogs

Project	Dates
SWEX: Sundowner Winds Experiment	Feb 19, 2020 to May 15, 2020
IMPACTS 2020: Investigation of Microphysics and Precipitation for Atlantic Coast-Threatening Snowstorms 2020	Jan 01, 2020 to Feb 29, 2020
OTREC: Organization of Tropical East Pacific Convection	Jul 01, 2019 to Oct 07, 2019
ACCLIP 2019: ACCLIP 2019-2020 Dry Run	Jun 15, 2019 to Aug 31, 2020
TORUS 2019: Targeted Observation by Radars and UAS of Supercells 2019	Apr 28, 2019 to Jun 26, 2019
HIGHWAY: High Impact Weather Lake System	Dec 20, 2018 to May 01, 2020
ICICLE: In-Cloud Icing and Large-Drop Experiment	Dec 17, 2018 to Mar 20, 2019
Meso18-19: Verification of the Origins of Rotation in Tornadoes Experiment-Southeast (VORTEX-SE) Meso18-19	Oct 22, 2018 to Apr 30, 2019
ICICLE 2018: ICICLE Dry Run	Oct 03, 2018 to Dec 01, 2018
SAVANT: Stable Air Variability and Transport	Aug 08, 2018 to Nov 15, 2018
OTREC 2018: OTREC Dry Run	Jul 09, 2018 to Sep 30, 2018
WE-CAN: Western Wildfire Experiment for Cloud Chemistry, Aerosol, Absorption and Nitrogen	Jun 15, 2018 to Sep 25, 2018
RELAMPAGO: Remote sensing of Electrification, Lightning, And Mesoscale/microscale Processes with Adaptive Ground Observations	Jun 01, 2018 to May 01, 2019
VORTEX-SE 2018: The Verification of the Origins of Rotation in Tornadoes Experiment Southeast (VORTEX-SE) 2018 Field campaign	Mar 01, 2018 to Apr 15, 2018
SOCRATES: Southern Ocean Clouds Radiation Aerosol Transport Experimental Study	Jan 01, 2018 to Feb 28, 2018
WE-CAN 2017: WE-CAN Dry Run	Sep 07, 2017 to Sep 29, 2017
VORTEX-SE 2017: Verification of the Origins of Rotation in Tornadoes Experiment-Southeast (VORTEX-SE) 2017 Field Campaign	Mar 01, 2017 to May 08, 2017
SOCRATES 2017: SOCRATES Dry Run 2017	Jan 10, 2017 to Dec 31, 2017
RELAMPAGO 2017: RELAMPAGO Dry Run	Dec 20, 2016 to Sep 30, 2018
Perdigao: Perdigao Field Experiment	Dec 15, 2016 to Jul 15, 2017
SNOWIE: Seeded and Natural Orographic Wintertime clouds - the Idaho Experiment	Nov 15, 2016 to Mar 17, 2017

Thank you and

