Workshop WGNE e JWGFVR: Numerical predictions for strategic sectoral applications: modeling and verification approaches and challenges

November 30th - December 1st

Sub-seasonal Applications for aGriculture and Environment (SAGE) 2024-2028

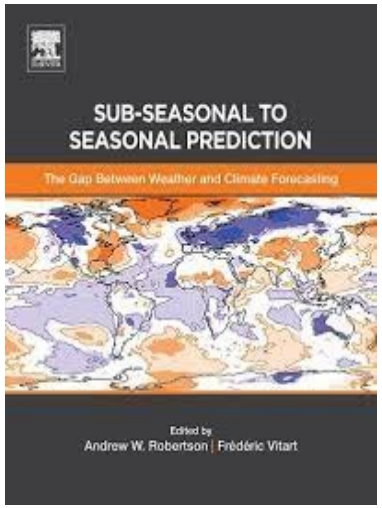
Steve Woolnough
Meteorologist at University of Reading

Victor Marchezini
Sociologist at Cemaden, Brazil

Subseasonal-to-Seasonal S2S Prediction Project

2016-2023

http://www.s2sprediction.net/



EBOOK

2015

-S2S DATABASE WAS LAUNCHED

-BEGAN A PILOT REAL-TIME SUBSEASONAL MULTI-MODEL ENSEMBLE PREDICTION SYSTEM

2016

-COUPLED DATA ASSIMILATION WORKSHOP

2017

-"NAVIGATING WEATHER WATER, ICE AND CLIMATE INFORMATION"

2018

2019

-S2S REAL TIME PILOT INITIATIVE WAS LAUNCHED

2020

2021

-S2S ARTIFICIAL INTELLIGENCE/ MACHINE LEARNING COMPETITION

2022

-S2S REAL TIME PILOT INITIATIVE WAS CONCLUDED

S2S FORECASTS FROM 11 OPERATIONAL CENTRES WERE MADE AVAILABLE TO 16 PRE-SELECTED PROJECTS IN REAL TIME

2016-2023

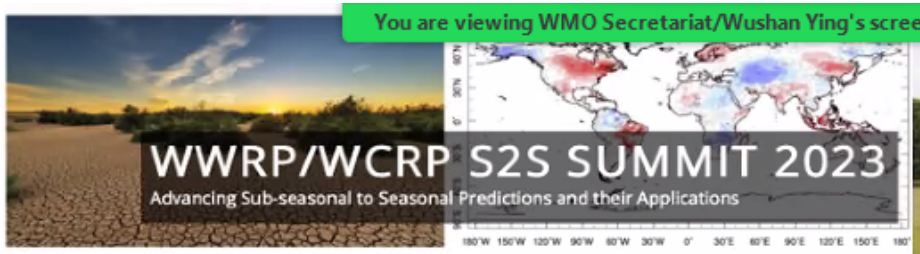
300 publications have used the S2S database

11 training courses

22 newsletters in the S2S website

17 webinars

Source: WMO (2023) (https://library.wmo.int/doc_num.php?explnum_id=11781)



03 - 07 July 2023

University of Reading, UK

- 191 attendees + about 40 online from 29 countries
- ½ attendees were Early career scientists
- 85 oral presentations + 109 posters around 3 themes: S2S processes/modelling/R2O
- 8 breakout groups

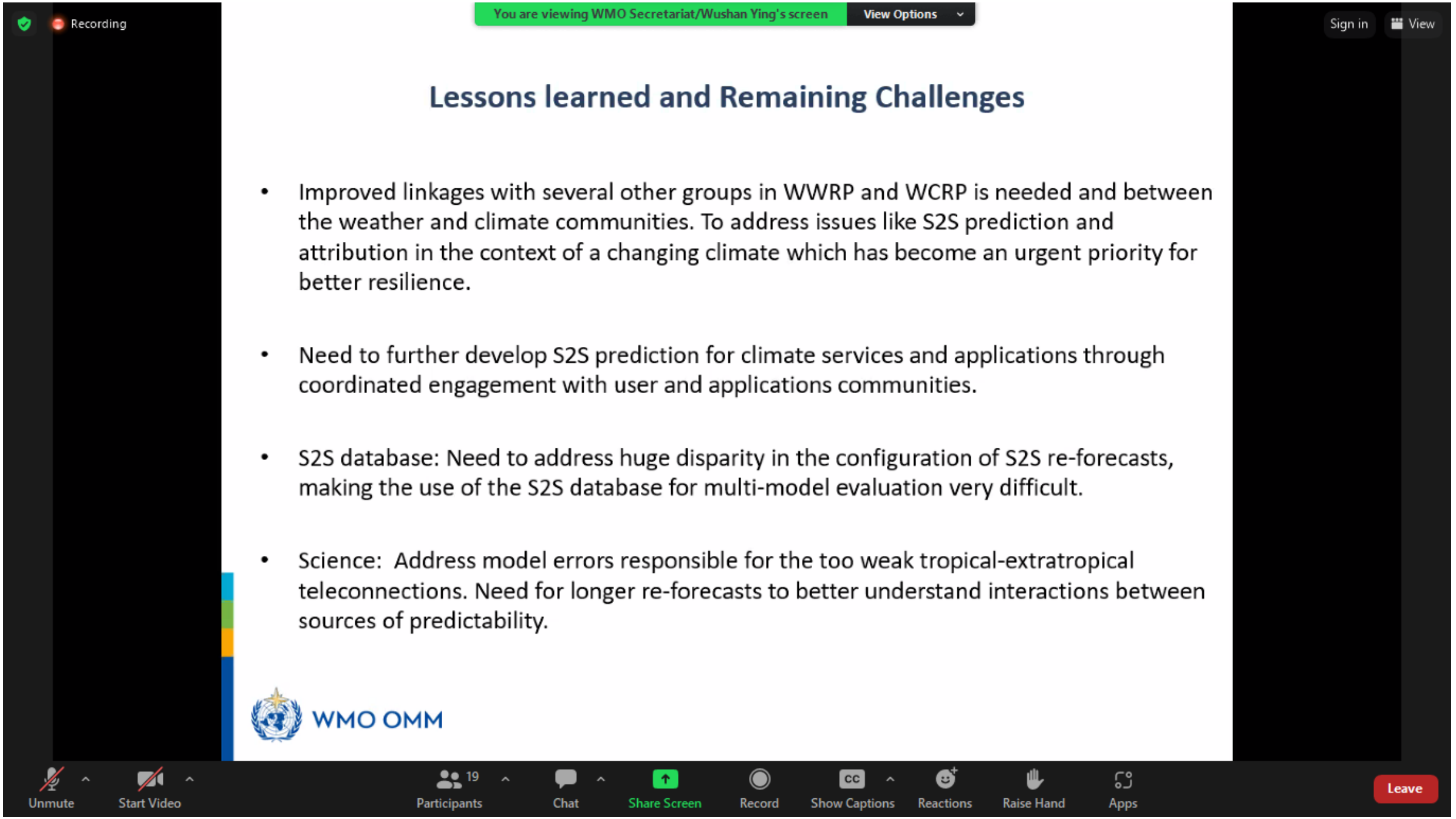
Main recommendations:

1. Need for international coordination of pan S2S activities that connect predictability research, modelling and observational needs as well as impact after the end of the WWRP/WCRP S2S project (end of 2023).
2. **Need for real-time access of S2S database**, in particular ECMWF S2S data (removal of the 3-week embargo).
3. The research and coordinated experimentation should be supported with adequate research databases and cloud infrastructure.
4. There is a wish for operational services to offer cloud capabilities for processing data.
5. Promote exchanges between ML and Met communities: Hold regular events for updates and training.

Conference article to be submitted to BAMS

WMO OMM

Source: Frederic Vitart (August 31, 2023)



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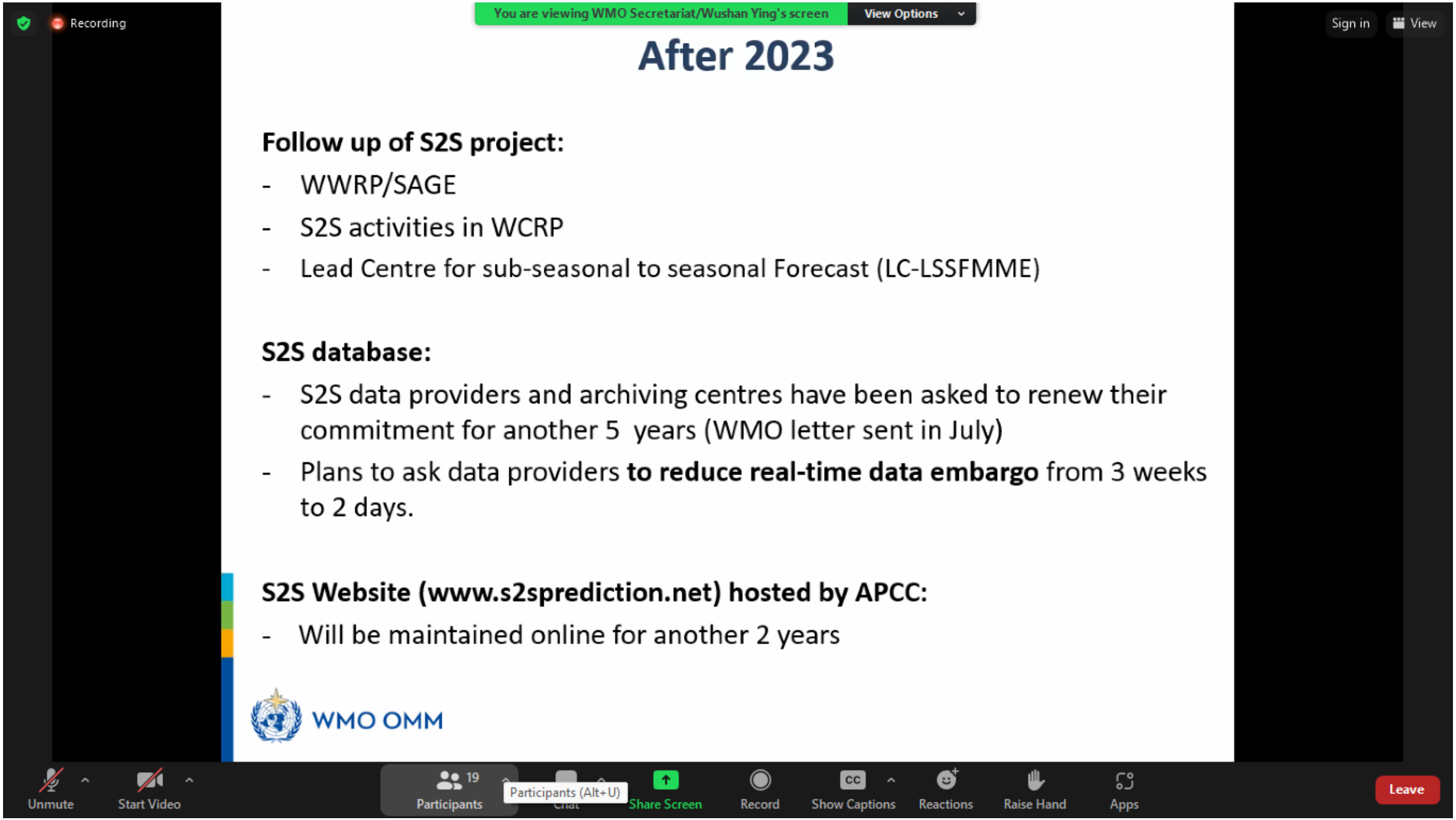
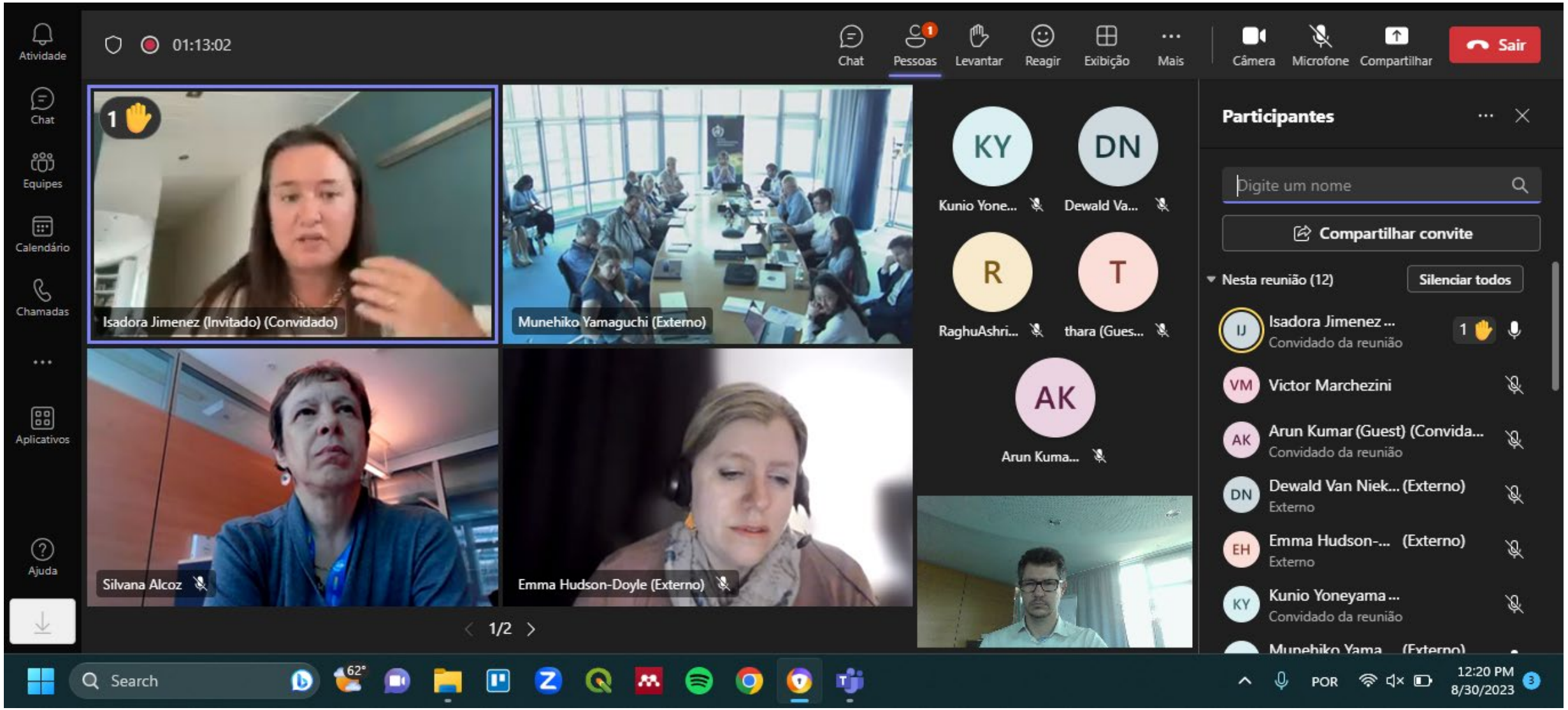


Source: Frederic Vitart (August 31, 2023)

WWRP MEETING AUGUST 2023- SAGE proposal received suggestions from 50 participants in two breakout sessions



Thank you!

Sub-seasonal Applications for aGriculture and Environment (SAGE) (2024-2028)

Enhancing and securing the necessities of life – SDGs, food security, water, energy and well being.

WHAT IS OUR AIM? (MAIN OBJECTIVE)	WHAT TO DO? (SPECIFIC OBJECTIVES)	WITH WHOM? (AUDIENCE)	HOW? SOLUTIONS-BASED PILOT PROJECTS
To make S2S forecasts more useful, usable and used for decision making	Identify decisions and the need for S2S information and products	agriculture (farmers)	Develop an action plan defining the disciplinary and interdisciplinary tasks
	Analyze how S2S information is currently used and disseminated	water resource management	Use pilot projects to analyze the value chain from forecast to decision and identify the needs for improving the value
	Identify the value of S2S information in decision making and what needs to be done to improve it	Energy sector	Encourage joint research projects that involve researchers from both social and physical sciences.
	Continue to develop and deliver training in the use and evaluation of S2S forecasts	Met services	
		Health sector	
		Disaster preparedness	

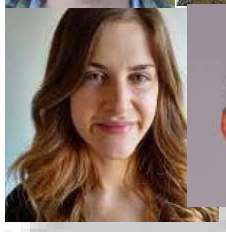
WMO IMO-WMO WWRP WORLD WEATHER RESEARCH PROGRAMME

Steve Woolnough (Co-chair)


Marisol Osman


Arun Kumar

Cristiana Stan




Rachel Lowe

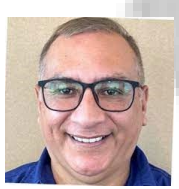
Constantin Ardilouze

Ziqiang Han

Yuhei Takaya

Masilin Gudoshava

Partha Mukhopadhya




Juan Bazo

Victor Marchezini (Co-chair)

Dewald van Niekerk

Roger Stone

Emma Doyle

SAGE - Steering Group Members

SAGE - Examples of some research actions

- Build on successes of S2S database and pilot applications
- Knowing where forecasts will/will not exhibit skill for extreme weather
- Users knowing appropriate actions under uncertainty
- Effective forecast development and communication
- Tailored and co-produced products for specific user groups
  - Agriculture
  - Water resources
  - Health
  - Renewable energy
- Metrics of effective use are co-designed with users.
- Ensuring ethics of research

Value of the forecast is determined by the action taken
Weaknesses in any part of the system can reduce the value of the forecast

Identify the need for S2S information and products

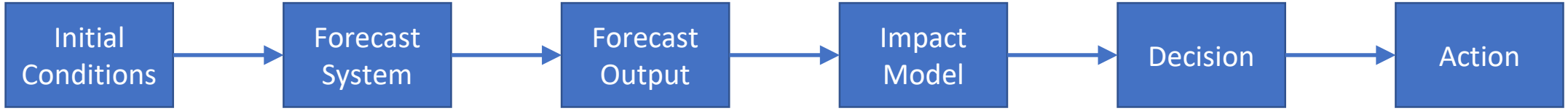
Analyze how S2S information is currently used and disseminated

How can we ensure our forecast can be used by an impact model?

How do we communicate the uncertainty (and their sources) in the impacts?

How do we communicate decisions to those responsible for taking action?

How do we monitor actions and their impacts?



Do we have data to initialize parts of the system that are sources of predictability?

How well does the model represent process that lead to predictability?

What is the best combination of resolution, complexity, ensemble size to capture the processes and the uncertainty?

How do we describe the skill and uncertainty in the forecast?

Can we identify and communicate windows of opportunity?

How can we post process raw output to account for known biases or errors in the forecast?

Does the impact model have the correct sensitivity to weather and climate data?

What decisions are available given the lead time?

What are the consequences of decisions?

How do we incorporate uncertainty into our decision making processes?

Monitoring, Evaluation and Learning (MEL) - SAGE

SAGE OBJECTIVES	**Possible measures of success:** **How would you know if this objective has been successfully achieved?**	**Baseline:** **What is the starting point for this objective? What is the situation now?**
Identify decisions and the need for S2S information and products		
Analyze how S2S information is currently used and disseminated		
Identify the value of S2S information in decision making and what needs to be done to improve it		
Continue to develop and deliver training in the use and evaluation of S2S forecasts		

ANY SUGGESTIONS?

WMO ENDORSED PROJECTS

-TERMS OF REFERENCE:

https://filecloud.wmo.int/share/s/RbryQlv-S3uhX_mfH7W7vw

-APPLICATION (QR CODE)

THANKS! OBRIGADO!

Professor Steve Woolnough
National Centre for Atmospheric Science
Department of Meteorology
University of Reading, UK
s.j.woolnough@reading.ac.uk

Victor Marchezini
Cemaden – National Early Warning and Monitoring Centre of Natural Disasters
Brazil
victor.marchezini@cemaden.gov.br