



MINISTÉRIO DA
**CIÊNCIA, TECNOLOGIA
E INOVAÇÃO**



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

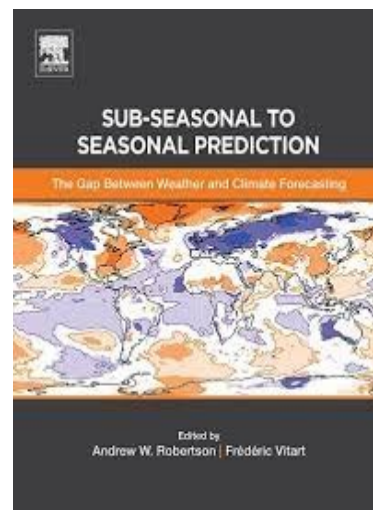
Victor Marchezini

Sociologist at Cemaden, Brazil

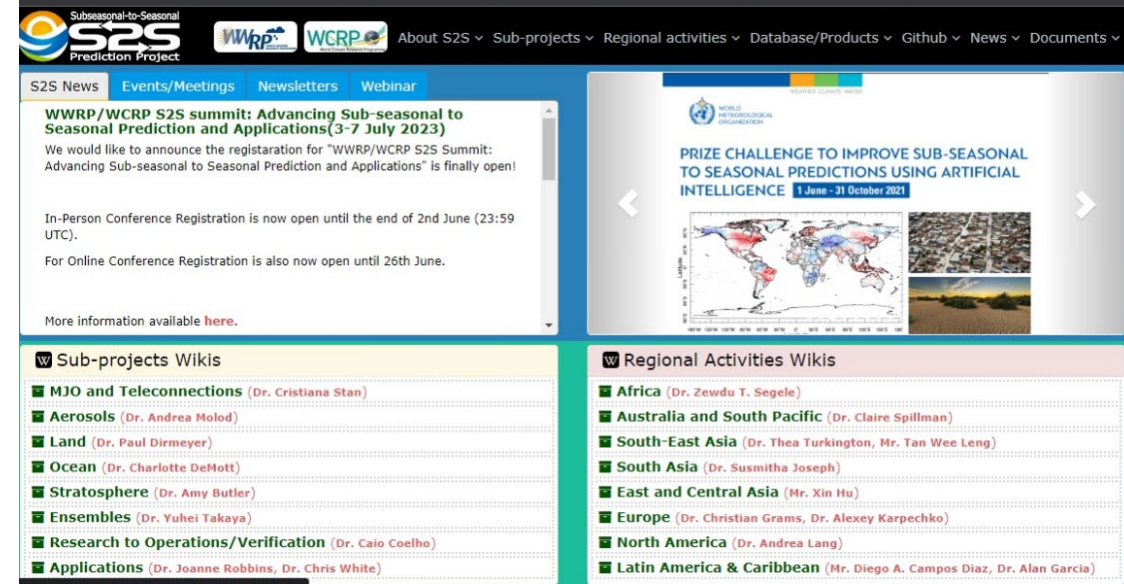




2016-2023



EBOOK



<http://www.s2sprediction.net>



2015

2016

2017

2018

2019

2020

2021

2022

2016-2023

-S2S DATABASE WAS LAUNCHED

-COUPLED DATA ASSIMILATION WORKSHOP

-"NAVIGATING WEATHER WATER, ICE AND CLIMATE INFORMATION"

-S2S REAL TIME PILOT INITIATIVE WAS LAUNCHED

-S2S ARTIFICIAL INTELLIGENCE/ MACHINE LEARNING COMPETITION

-S2S REAL TIME PILOT INITIATIVE WAS CONCLUDED

300 publications have used the S2S database

11 training courses

22 newsletters in the S2S website

17 webinars

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

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





- 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



Lessons learned and Remaining Challenges

- Improved linkages with several other groups in WWRP and WCRP is needed and between the weather and climate communities. To address issues like S2S prediction and attribution in the context of a changing climate which has become an urgent priority for better resilience.
- Need to further develop S2S prediction for climate services and applications through coordinated engagement with user and applications communities.
- S2S database: Need to address huge disparity in the configuration of S2S re-forecasts, making the use of the S2S database for multi-model evaluation very difficult.
- Science: Address model errors responsible for the too weak tropical-extratropical teleconnections. Need for longer re-forecasts to better understand interactions between sources of predictability.



After 2023

Follow up of S2S project:

- WWRP/SAGE
- S2S activities in WCRP
- Lead Centre for sub-seasonal to seasonal Forecast (LC-LSSFMME)

S2S database:

- S2S data providers and archiving centres have been asked to renew their commitment for another 5 years (WMO letter sent in July)
- Plans to ask data providers **to reduce real-time data embargo** from 3 weeks to 2 days.

S2S Website (www.s2sprediction.net) hosted by APCC:

- Will be maintained online for another 2 years



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

The screenshot displays a Microsoft Teams meeting interface during a breakout session. The main view shows four video thumbnails of participants: Isadora Jimenez (Invitado) (Convidado), Munehiko Yamaguchi (Externo), Silvana Alcoz, and Emma Hudson-Doyle (Externo). A fifth thumbnail shows a group of people in a meeting room. The interface includes a top navigation bar with icons for Chat, Pessoas, Levantar, Reagir, Exibição, and Mais, along with controls for Câmera, Microfone, and Compartilhar. A sidebar on the left contains icons for Atividade, Chat, Equipes, Calendário, Chamadas, Aplicativos, and Ajuda. The bottom of the screen shows the Windows taskbar with various application icons and the system tray displaying the time as 12:20 PM on 8/30/2023.

Participants List:

- KY: Kunio Yone...
- DN: Dewald Va...
- R: RaghuAshri...
- T: thara (Gues...)
- AK: Arun Kuma...

Participants (12):

- Isadora Jimenez ... (Convidado da reunião) - 1 hand icon
- Victor Marchezini
- Arun Kumar (Guest) (Convida... (Convidado da reunião)
- Dewald Van Niek... (Externo) Externo
- Emma Hudson-... (Externo) Externo
- Kunio Yoneyama ... (Convidado da reunião)
- Munehiko Yama... (Externo)

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

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

agriculture (farmers)

water resource management

Energy sector

Met services

Health sector

Disaster preparedness

Develop an action plan defining the disciplinary and interdisciplinary tasks

Use pilot projects to analyze the value chain from forecast to decision and identify the needs for improving the value

Encourage joint research projects that involve researchers from both social and physical sciences.

Steve Woolnough (Co-chair)



Marisol
Osman



Arun Kumar

Cristiana
Stan



Rachel Lowe Constantin
Ardilouze



Ziqiang Han



Yuhei Takaya



Masilin
Gudoshava



Partha
Mukhopadhyaya

Emma Doyle



Juan Bazo



Victor Marchezini
(Co-chair)



Dewald van
Niekerk



Roger Stone



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

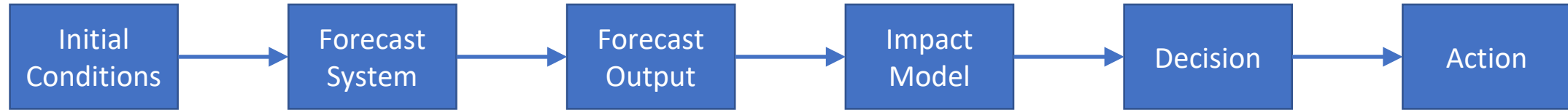
Analyze how S2S information is currently used and disseminated

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!

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