



CCRS weekly scientific seminar

CCRS conducts a weekly seminar series to disseminate and share scientific progress or relevance to MSS either within CCRS, other MSS departments as well as other institutions across Singapore and overseas (contribution from short term visitors are particularly welcome).

Our Seminar Series are open (unless indicated otherwise) and we are welcoming our colleagues either as presenters or attendees.

Key details:

- Time** Mostly held on Wednesday (at 11am). You may check our past and upcoming [schedules](#).
- Venue** Our main venue is the CCRS Auditorium accessible from the foyer of CCRS building (visitor external to the NEA do need to sign in), 36 Kim Chuan Rd, Singapore 537054
- Topics** We are welcoming any topics within earth sciences (e.g. climate, weather, oceanography, geology, geodesy), applications and impacts from earth science developments and other scientific works which have a connection with climate and weather. We are welcoming completed studies as well as work in progress likely to foster interesting discussions.

For further enquiries, or to express an interest in presenting, please contact our friendly CCRS seminar [coordinator](#).

2017 Seminar Schedule

DAY/DATE	TIME	PRESENTER	AFFILIATION	THEME/TITLE
Thu, Feb 16	10 – 11	Agnes Lim Huei Ni	Univ. of Wisconsin Madison	Overview of SSEC Satellite Infrastructure and DA>NWP related activities Abstract
Wed, Feb 22	10 – 11	R. Kartika Lestari	CCRS	Drying projection in the western maritime continent during Southwest and Northeast monsoon seasons Abstract
Thu, Mar 2	14 – 16	Hans X.-Y. Huang	CCRS	An Introduction to Data Assimilation (DA) Abstract
Wed, Mar 8	11 – 12	Peter Heng	CCRS	High resolution modelling for impact studies Abstract
Wed, Mar 15	10:30 – 12:00	Raizan Rahmat Thea Turkington	CCRS CCRS	Outcomes from the Subseasonal-to-Seasonal Predictions Workshop Abstract Regional Climate Centre web portal: demonstration and future plans Abstract
Wed, Mar 22	15 – 16	Peter May	BOM, Australia	Research and Development at the Australian Bureau of Meteorology Abstract
Wed, Apr 5	10 – 12	Hans Huang	CCRS	Data assimilation: from equations to a real system Abstract
Wed, Apr 12	11 – 12	Xiangming Sun	CCRS	Fractions skill score (FSS) Abstract
Wed, Apr 19	11 – 12	Muhammad E. Hassim	CCRS	Understanding the interplay between the MJO and the western Maritime Continent Abstract
Wed, May 24	11 – 12	Bertrand Timbal	CCRS	Statistical versus dynamical downscaling in the tropics: what are the challenges ? Abstract
Wed, Jun 7	11 – 12	Madeline Ang	RRD	A Wobbly World, Prolific Plants and Massive Mountains: The Interplay of Ice Ages and Biodiversity Abstract
Wed, Jun 28	11 – 12	Chien Wang	MIT/CENSAM	Impacts of aerosols on precipitation Abstract

Abstract

Date : 16 Feb 2017 (10:00 – 11:00)

Presenter : Agnes Lim Huei Ni, Univ. of Wisconsin Madison

Theme : Overview of SSEC Satellite Infrastructure and DA>NWP related activities

Abstract

Space Science and Engineering Center at the University of Wisconsin-Madison, home to the father of satellite meteorology, is a research and development center focusing on geophysical research and technology to enhance our understanding of the atmosphere of Earth, the other planets in our Solar System, and the cosmos. We develop and demonstrate new observing systems for spacecraft, aircraft, and ground-based platforms. We receive, manage and distribute significant amounts of geophysical data and develop software to process, visualize and manipulate these data to gain insight into weather and climate, as well as atmospheric processes and phenomena. This presentation will provide the audience with an overview on our satellite data center infrastructure and show case some of our latest research devoted to the board and optimal usage of satellite information for the advancement of numerical weather prediction.

Date : 22 Feb 2017 (10:00 – 11:00)

Presenter : R. Kartika Lestari, CCRS

Theme : Drying projection in the western maritime continent during Southwest and Northeast monsoon seasons

Abstract

In the maritime continent, the precipitation variability is large and recently, this region experiences longer dry season and more number of severe drought events that are threatening the human life, such as, water supply for daily life and agriculture, and unhealthy air quality due to the increased number of wildfires. Global warming has been known to contribute to the rainfall anomalies around the world, and present study investigate the extent to which the drying conditions are going to be happened in 21st century over western part of the maritime continent (WMC), where the population is much larger than the eastern part, during both active Southwest (SW) and Northeast (NE) monsoon seasons. A future change in the precipitation over WMC is suggested from our analyses of the Coupled Model Intercomparison Project Phase 5 (CMIP5) models. In addition to CMIP5, we analyse the downscaled data of nine selected CMIP5 models to examine if there is modification in the drying projection when higher resolution data are used. While the north and south of equator show out of phase in the precipitation change, the region around equator shows decreased precipitation during both the SW monsoon in June-July-August-September (JJAS) and the peak of NE monsoon in February (FEB). The drying projection is robustly shown in FEB when Intertropical Convergence Zone (ITCZ) shift to the southern hemisphere, but the same robustness is not shown in JJAS when the monsoon over South China Sea is active. The detail results, including the mechanisms that drive the drying projection, and the

possible reasons causing different degree in the robustness between two seasons, will be shown in the presentation.

Date : 2 Mar. 2017, THU (14:00 – 16:00)
Presenter : Hans X.-Y. Huang, CCRS
Theme : An Introduction to Data Assimilation (DA)
Abstract

This lecture mainly to provide background information for them and for anyone who are interested in the NWP products which are based on data assimilation, e.g., SINGV DA and WRF DA...

After this lecture, we are expected to know the answers to some or all the questions below:

- What do people use DA for?
 - What is DA (in the simplest terms)?
 - What are the basic assumptions behind the modern DA formulations (and excuses when DA does not work)?
 - What are the most fundamental equations for DA? And how can they be derived in a simple way? (I know most people don't like equations – but we only have one set of equations for data assimilation. I hope you will find it easy to derive them.)
 - What are the popular research issues in DA ?
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Date : 8 Mar. 2017, WED (11:00 – 12:00)
Presenter : Peter Heng, CCRS
Theme : High resolution modelling for impact studies
Abstract

The value-add of high-resolution convection-permitting (CP) climate modelling for local impact studies was demonstrated in Singapore's Second National Climate Change Study. This presentation summarises the key findings of that study relating to CP climate modelling and showcases CCRS's follow-on investigation into the statistics of rainfall extremes over Singapore. A proposed study to address some of the outstanding questions relating to CP climate modelling for our region will also be outlined, with preliminary results presented.

Date : 15 Mar. 2017, WED (10:30 – 11:15)
Presenter : Raizan Rahmat, CCRS
Theme : Outcomes from the Subseasonal-to-Seasonal Predictions Workshop
Abstract

Meteorological Service Singapore (MSS) as host of the ASEAN Specialised Meteorological Centre (ASMC) organised the first workshop of a 4-part series Capability Building Programme on Subseasonal-to-Seasonal Predictions for Southeast Asia (S2S-SEA

I) on 27 Feb – 3 Mar 2017. The S2S, which covers the timescale from 2 weeks to 2 months, is a relatively new field promoted by the scientific and applications communities of World Meteorological Organization (WMO) and has important applications in the areas of water resources, disaster-risk, and agricultural management and planning. The aim of the programme is to enhance the capacity of the regional meteorological services in S2S through joint analyses of model skill and exploring development of products for use by the various sectors. The presentation will provide an introduction to S2S and share the scientific results and discussions arising from the workshop, in particular the assessment of skill of the model in predicting rainfall and temperature conditions in the Southeast Asia region at different lead times.

Date : 15 Mar. 2017, WED (11:15 – 12:00)
Presenter : Thea Turkington, CCRS
Theme : Regional Climate Centre web portal: demonstration and future plans
Abstract

The talk will cover the recent updates in the upcoming Regional Climate Centre web portal, as well as the future capabilities and plans for the portal.

Date : 22 Mar. 2017, WED (15:00 – 16:00)
Presenter : Peter May, BOM – Australia
Theme : Research and Development at the Australian Bureau of Meteorology
Profile of Dr. Peter May

Dr. Peter May is Head of Research, Australian Bureau of Meteorology. His group's scientific activities cover environmental issues, climate science and weather applications as well as developing staff and corporate capability. Currently he is a member of the Management Committee for the WMO Commission of Atmospheric Science that oversees WMO weather and environmental research coordination. During his career, Dr. May has authored or co-authored more than 110 papers in the peer reviewed literature. Dr. May has overseen the development of the operational systems that underpin Bureau services as well as major projects delivering climate information to the nation. These include the development of atmospheric and marine forecast systems. Dr. May also serves on a number of national advisory committees and represent the Bureau at major national and international committees.

Date : 5 Apr. 2017, WED (10:00 – 12:00)
Presenter : Hans X.-Y. Huang, CCRS
Theme : Data assimilation: from equations to a real system
Abstract

I will review briefly what I presented last time (if you did not attend the first one, you can go through the ppt and come to my office to discuss the issues you may have with the ppt). Then I will go through the steps most DA developers take to turn a set of equations to a real DA system. In this process, I will touch a few important concepts and practical aspects of DA.

Date : 12 Apr. 2017, WED (11:00 – 12:00)

Presenter : Xiangming Sun, CCRS

Theme : Fractions Skill Score

Abstract

1. The definition of FSS and how to calculate it
 2. Advantages, limitation and know issues using FSS to verify precipitation
 3. Current tools available in MSS
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Date : 19 Apr. 2017, WED (11:00 – 12:00)

Presenter : Muhammad Eeqmal Hassim, CCRS

Theme : Understanding the interplay between the MJO and the western Maritime Continent

Abstract

What happens when the 'sultry' MJO meets the 'stoic' western Maritime Continent (WMC)? Why does rainfall peak over land before it peaks over the sea as the MJO approaches and propagates over the region? In short, how does the MJO 'tango' with the WMC? In this study, we seek to 'answer' these intriguing questions by using 10-year regional climate simulations at 12 km and 4.5 km over the WMC for the boreal winters of 2000-2010. We highlight the relative importance of MJO-related anomalies in the large-scale environment and diurnal mesoscale circulations in governing convective rainfall, to suggest that scale interactions are an essential part to understanding the MJO effect on rainfall over the region.

Date : 24 May 2017, WED (11:00 – 12:00)

Presenter : Bertrand Timbal

Theme : Statistical versus dynamical downscaling in the tropics: what are the challenges ?

Abstract

The need to develop downscaling approaches to capture small-scale regional climate features of interest for climate impact and adaptation studies is well understood. The due process to develop, evaluate and establish the added value of the various technical options available to deliver on this challenge is not necessarily as well understood. As a cornerstone, resides the paradigm that small-scale climate features can be driven by large-scale forcing. The applicability of that paradigm to the Tropics is what we will discuss in that seminar.

Date : 7 June 2014, WED (11:00 – 12:00)

Presenter : Madeline Ang (RRD)

Theme : A Wobbly World, Prolific Plants and Massive Mountains: The Interplay of Ice Ages and Biodiversity

Abstract

The impact of permanent glaciation - and its potential loss - is very much alive in the scientific and public consciousness due to Climate Change. This talk investigates the interplay between Earth's climate and its biology during the current period before stepping back in time to investigate the role plants played in the Late Palaeozoic Ice Age (340 million years ago) as well as the possible impact of Snowball Earth (600 million years ago) on the dawn of complex life.

Date : 28 June 2017, WED (11:00 – 12:00)
Presenter : Chien Wang (MIT/SMART/CENSAM)
Theme : Impact of aerosols on precipitation
Abstract

Aerosol remains one of the most uncertain factors in climate projection. Aerosol can affect the radiative balance of the climate system by directly scattering or absorbing sunlight, or by acting as cloud condensation nuclei and ice nuclei and thus modifying the optical properties as well as lifetimes of clouds. It has been known for long that such effects contribute to the variation of Earth's surface temperature. On the other hand, aerosol can influence precipitation by either modifying cloud microphysical processes through aerosol activation, or by modifying local thermodynamical profile, facilitating an on-site impact on clouds overlapping with aerosol population. In addition, recent studies have also suggested that the direct and indirect radiative effects of aerosols can perturb the large-scale circulation and cause significant changes in cloud cover and precipitation in places often distant from aerosol laden regions, i.e., facilitating a remote impact. Understanding and quantifying the impact of aerosol on precipitation is a more challenging task than doing so on temperature because the former impact involves many sophisticated feedbacks that are still difficult to measure or model. Recent progress to include interactive aerosol features in many climate or Earth system models besides process models has made it possible to study aerosol-cloud-precipitation mechanism through long climate integrations, by considering the inhomogeneous distribution of aerosol forcing and feedback, or by combining with or separating from other anthropogenic forcers. For instance, recent results of models with above-mentioned improvements suggest that aerosol has played a dominant role over greenhouse gases in causing pattern changes of many precipitation systems in past decades. I will use research findings to discuss the current understanding alongside major challenges of both on-site and remote impacts of aerosol on precipitation.
