



WCRP workshop
“The Earth’s Energy Imbalance and its implications”
13 – 16 November 2018, Toulouse, France

Sponsors:



FINAL AGENDA

Venue:

Le Village by CA Toulouse 31
31 Allées Jules Guesdes,
31000 Toulouse

DAY 1 Tuesday November 13, 2018		
08:30 – 09:00 Registration		
Session 1: Global estimates of Earth's Energy Imbalance		Chairs: Karina von Schuckmann, Remy Roca
09:00 - 09:15	Welcome and introduction	Karina von Schuckmann
09:15 - 09:35	Solicited keynote: Measuring the Surface Energy Imbalance from Space	Tristan L'Ecuyer, Benoit Meyssignac , and the NASA NEWS science team
09:35 - 09:55	Solicited keynote: Global ocean heat content - From historical to contemporary estimates	Tim Boyer , Catia Domingues, Karina von Schuckmann, Lijing Cheng
09:55 - 10:15	Solicited keynote: Net flux at the top of the atmosphere	Norman Loeb
10:15 - 10:35	Solicited keynote: The role of cryosphere in the Earth Energy Imbalance	Fiammetta Straneo
10:35 - 10:50	Can we derive Earth's energy imbalance from Sun and Earth's radiation pressure acting on spherical LEO satellites?	Maria Hakuba , Graeme L. Stephens, Felix W. Landerer, Frank H. Webb, Srinivas V. Bettadpur, Byron D. Tapley, Bruno Christoph, Bernard Foulon
10:50 – 11:15 Coffee Break & Poster viewing session		
11:15 – 11:30	Towards monitoring trends and variability in the atmospheric heat content (AHC) primarily based on radio occultation	Gottfried Kirchengast , Florian Ladstädter, Barbara Angerer, Andrea K. Steiner, Maximilian Gorfer, Florian Lippl
11:30 – 11:45	Global to regional manifestation of Earth's energy imbalance	Richard Allan , Chunlei Liu, Pat Hyder, Matt Palmer, Chris Roberts, Michael Mayer
11:45 – 12:00	Poleward energy transport: is the standard definition physically relevant at all time scales?	Minyi Liang
12:00 – 12:15	Determine Earth Radiation Imbalance (ERI) Using GEO-MEO Constellations	Dong Wu
12:15 – 12:30	Ocean Reference Stations - Sustained in situ observing of air-sea fluxes	Robert Weller , Albert J. Plueddemann, J. Thomas Farrar, Sebastien P. Bigorre, Michael Schlundt
12:30 – 12:45	Towards quantifying uncertainty in ocean heat content changes using synthetic profiles	Matt Palmer , Lesley Allison, Chris Roberts, Rachel Killick, Leon Hermanson, Nick Rayber, Doug Smith
12:45 – 14:00 Lunch break		
14:00 – 14:15	Introduction/organization of working groups	Karina von Schuckmann
14:15 – 15:15	Working group session I (several small groups in parallel)	
15:15 – 16:00 Poster viewing session & coffee		
16:00 – 17:00	Working group session I (several small groups in parallel)	
17:00 – 18:00	Round table: wrap-up of outcomes from the working group session I	

DAY 2		Wednesday November 14, 2018	
Session 2: Regional Energy Budgets and Energy Transports		Chairs: Kevin Trenberth, Andrea Steiner	
09:00 - 09:20	Solicited keynote: Regional energy budget constraint approach	Kevin Trenberth	
09:20 - 09:40	Solicited keynote: Regional Earth system view from the cryosphere perspective	Andrew Shepherd	
09:40 - 10:00	Solicited keynote: Covariance and structural error in regional heat budgets	Keith Haines	
10:00 - 10:15	North Atlantic Ocean heat budget on different time scales from VOS data and reanalyses	Sergey Gulev , Konstantin Belyaev, Alexander Gavrikov, Marina Aleksandrova	
10:15 - 10:30	Evolution of ocean heat change related to ENSO	Lijing Cheng , Kevin E. Trenberth, John Fasullo, Michael Mayer, Magdalena Balmaseda, Jiang Zhu	
10:30 – 11:00 Coffee Break & Poster viewing session			
11:00 – 11:15	Magnitude and changes in surface radiation budget inferred from surface observations and climate models	Martin Wild	
11:15 – 11:30	Regional Surface Energy Budget Derived from Satellite Observations	Seiji Kato , Fred G. Rose, David A. Rutan, Norman G. Loeb, and John T. Fasullo	
11:30 – 11:45	Synthesis and evaluation of historical meridional heat transport from midlatitudes towards the Arctic	Yang Liu , Jisk Attema, Wilco Hazeleger	
11:45 – 12:00	A Preliminary Comparison of Air-Sea Fluxes From Coupled Earth-System Reanalysis Against OceanSITES Mooring Data	Maria Valdivieso , Magdalena Balmaseda, Michael Mayer, Steffen Tietsche, Hao Zuo	
12:00 – 12:15	Coupled heat budget diagnostics using ECMWF's new reanalyses	Michael Mayer , Steffen Tietsche, Magdalena A. Balmaseda, Hao Zuo, Leo Haimberger	
12:15 – 12:30	Sensitivity of the Energy Budget and Water Cycle to Global Climate Models' Resolution	Benoît Vanniere , Marie-Estelle Demory, Reinhard Schiemann, Pier Luigi Vidale	
12:30 – 14:00 Lunch break			
14:00 – 14:15	Introduction/organization of working groups	Karina von Schuckmann	
14:15 – 15:15	Working group session II (several small groups in parallel)		
15:15 – 16:00 Poster viewing session & coffee			
16:00 – 17:00	Working group session II (several small groups in parallel)		
17:00 – 18:00	Round table: wrap-up of outcomes from the working group session II		
19:30-22:30 Ice Breaker		Le Village	

DAY 3 Thursday November 15, 2018		
Session 3: Earth energy imbalance evaluation and budget closure for climate models and		Chairs: Till Kuhlbrodt, Benoit Meyssignac
09:00 - 09:20	Solicited keynote: The role of land in the Earth Energy Imbalance	Sonia Seneviratne
09:20 - 09:40	Solicited keynote: The challenge of Energy budget closure in Earth system models	Peter Lauritzen
09:40 – 10:00	Solicited keynote: Evaluation of the Earth's Energy Imbalance in ocean reanalyses	Matt Palmer , Magdalena Balmaseda, Marie Drevillon, Simona Masina, Michael Mayer, Andrea Storto, Karina von Schuckmann
10:00 – 10:20	Solicited keynote: Ice sheets and their coupling in Earth system models	Sophie Nowicki
10:20 - 10:35	Earth's Energy Imbalance, SST Patterns, and Natural Variability	Cristian Proistosescu , Kyle Armour, Robert Jnglin Wills, David S. Battisti, Yue Dong, Malte Stuecker
10:35 – 10:50	Inverse modelling of the Earth's energy and water budgets using EO and reanalysis data	Chris Thomas, Bo Dong, Keith Haines, Chunlei Liu, Davi Mignac, Richard Allan
10:50 – 11:05	Constraining the Global Ocean Heat Content Through Assimilation of CERES-Derived TOA Energy Imbalance Estimates	Chunxue Yang , Andrea Storto and Simona Masina
10:05 – 11:45 Coffee Break & Poster viewing session		
11:45 – 12:00	The Impact of Uncertainties in Radiative Forcing on the Earth's Energy Imbalance	Brian Soden, Ryan Kramer , Daniel Feldman , Bill Collins
12:00 – 12:15	On the definitions of 'heat' and 'work' in the atmosphere and ocean	Remi Tailleux
12:15 – 12:30	Assessment of the Earth Energy Budget within the CMIP5 Ensemble: Preliminary Results	Francisco José Cuesta-Valero , Almudena García-García, Hugo Beltrami, Joel Finnis
12:30 – 12:45	Ocean heat balance in ocean reanalyses from ECMWF	Eric de Boisseson
12:45 – 14:15 Lunch break		
14:15 – 14:30	Introduction/organization of working groups	Karina von Schuckmann
14:30 – 15:30	Working group session III (several small groups in parallel)	
15:30 – 16:15 Poster viewing session & coffee		
16:15 – 17:15	Working group session III (several small groups in parallel)	
17:15 – 18:15	Round table: wrap-up of outcomes from the working group session III	

DAY 4		Friday November 16, 2018	
Wrap-up and way forward		<i>Chairs: Karina von Schuckmann, Remy Roca</i>	
09:00 - 09:30	Overview and outcomes of session 1 (Session 1 chairs + working group leaders): 15 min. talk, 15 min. discussion		
09:30 - 10:00	Overview and outcomes of session 2 (Session 2 chairs + working group leaders): 15 min. talk, 15 min. discussion		
10:00 – 10:30	Overview and outcomes of session 3 (Session 3 chairs + working group leaders): 15 min. talk, 15 min. discussion		
10:30 – 11:00 Coffee Break & Poster viewing session			
11:00 – 12:45	Round table & Discussion: Towards a WCRP wide activity on the Earth Energy Imbalance	Karina von Schuckmann, Remy Roca, Benoit Meyssignac, Boram Lee, Fiammetta Straneo (TbC), Sonia Seneviratne (TbC), Graeme Stevens (TbC), Andrea K. Steiner, Kevin Trenberth, Till Kuhlbrodt	
12:45 – 13:00	Wrap-up and closing remarks	Karina von Schuckmann	

Posters	
DAY1 (SESSION 1)	Authors
Larger than expected ground heat flux storage	Pierre Gentine, Edouard Davin, Sonia I. Seneviratne :
Preliminary global energy budget calculations with ERA5 data	Johannes Mayer, Michael Mayer:
Towards essential climate variables (ECVs) assessment in the frame work of Copernicus climate service	Chunxue Yang, Rosalia Santoleri, Salvatore Marullo, Vincenzo Artale, Bruno Buongiorno Nardelli:
Global Warming, New Energy Balance, New Atmospheric Circulation and Extreme Meteorological Phenomena	Mohammed Said Karrouk:
Updated global surface energy flux estimation and evaluation	Chun Lei Liu, Richard Allan:
Determine the Daytime Earth Radiation Budget from DSCOVER	Wenying Su, L. Liang, D. P. Duda, K. Khlopenkov, M. K. Thiemann, P. Minnis:
Observational ocean heat content changes: progresses and limitations	Lijing Cheng, Gongjie Wang:
Sea level change since 2005: importance of salinity	William Llovel, Sarah Purkey, Benoit Meyssignac, Nicolas Kolodziejczyk, A. Blazquez and J. Bamber:
An alternative view on Earth Energy Imbalance	Miklos Zagoni:
DAY2 (SESSION 2)	
Towards consistent diagnostics of the coupled atmosphere and ocean energy budgets	Michael Mayer, Leopold Haimberger, John M. Edwards, Patrick Hyder:
Exploring the Atlantic/Pacific heat uptake contrast using a GCM with idealised geometry	Peter Shatwell, David Ferreira, Arnaud Czaja:
Global ocean heat content redistribution during the 1998-2012 Interdecadal Pacific Oscillation negative phase	Guillaume Gastineau, Andrew R. Friedman, Myriam Khodri, Jérôme Vialard:
Surface Energy Budget and Monsoon Precipitation over North East India(NEI)	Pramod Kumar, A.P.Dimri:
Evaluation of estimated incoming solar radiation in central parts of Iran using RegCM4	Yazdanpanah Hojjatollah, Mehran Heidary Benni:
Seasonal Changes in Outgoing Longwave Radiation over Arctic as Depicted by AIRS, CERES, MERRA-2, and TOVS	Jae N. Lee:
Interannual Oscillations and Meridional Progression of Arctic Summertime TOA Fluxes	Wu Dong, Jae N. Lee:
Narrowing Ocean Latent Heat Flux Uncertainties: Perspectives from Reanalysis and Satellite Estimates	Franklin Robertson, Jason B. Roberts, Michael G. Bosilovich:
DAY3 (SESSION 3)	
"Separating the influence of anthropogenic aerosol and greenhouse gas forcing on the transport and storage of anomalous	Damien Irving, Susan Wijffels, John Church:
"Impact of surface spectral emissivity and longwave cloud scattering on global and regional energy budgets"	Xianglei Huang, Xiuhong Chen, Yi-Hsuan Chen, Ping Yang, Chia-Pang Kuo, Mark Flanner:
Detection and attribution of anthropogenic signals in the ocean heat content	Katarzyna B. Tokarska, Gabriele C. Hegerl, Andrew P. Schurer, Aurélien Ribes, Andrew R. Friedman, John Fasullo:
Earth Outgoing Radiation Viewed from a Moon-based Platform	Hanlin Ye, Huadong Guo, Guang Liu:
Infiltration Radiant Flux Model using MODES Sensors Data in Northern Indian Ocean	Pavan Pavan:
Decadal and multi decadal climate variability in Pacific and Atlantic regions : Influence on Southwest Indian Monsoon	Rohit Srivastava:
Surprising relationship between sensible and latent air-sea turbulent heat fluxes in CMIP5 (and other) climate model	Sergey Gulev, Ilia Serykh, Natalia Tilinina, Wonsun Park, Mojib Latif:
Assessing energy and water budgets in climate models	Paul J. Durack, Ronald J. Stouffer, Matt D. Palmer, Steve Derbyshire, John P. Krasting:
A new diagnostic tool for water, energy and entropy budgets in climate models	Valerio Lembo, Valerio Lucarini, Frank Lunkeit: