3nd FAMOS workshop

AGENDA

Tuesday, October 21, 2014

FAMOS School for young scientists

Redfield auditorium on Water Street in Woods Hole

8:15 8:30 Coffee

8:30 9:15 Mike Steele: Introduction (welcome, FAMOS workshop school major goals and tasks, school agenda)

09:15 10:15 Bonnie Light: Modeling the physics of summer melt on Arctic sea ice: changing snow, shrinking ice, and plenty of sunshine

10:15 10:45 Coffee break

10:45 11:45 Paul Wassmann (UiT Norway´s Arctic University, Norway): The productivity of the Arctic Ocean, now and in the future, as revealed by modelling

11:45 12:45 Patrick Heimbach (MIT, USA): The ends and means of (ice/ocean) data assimilation

12:45 13:45 Lunch

13:45 15:00 Outreach discussion (moderator: Mike Steele**)**

- Bruno Tremblay

- **Mary-Louise Timmermans (**Yale University, USA**):** *Double diffusion in the Arctic Ocean: a laboratory primer*

15:00 16:00 Laurie Padman (Earth and Space Research, USA):Tidal impacts on the Arctic ocean and sea ice

16:00 17:00 Clara Deser (UCAR, USA): Modeling the impact of Arctic sea ice loss on the global atmosphere: current research and outstanding issues

18:15 Ferry from Woods Hole to Vineyard Haven, arrival 19:00

21:30 Departure from Vineyard Haven back to Woods Hole, arrival 10:15 pm

Wednesday, October 22, 2014

Redfield auditorium on Water Street in Woods Hole

8:45 9:00 Coffee

9:00 9:30 Andrey Proshutinsky: *Introduction (welcome, workshop major goals, tasks and working groups)*

NOTE # 1: Discussion means: 1hour working group meetings +30 minutes for plenary discussion

NOTE # 2: Oral presentation time = 12 minutes + 3 minutes for questions (AGU style)

NOTE #3: All Posters will be displayed on Wednesday and Thursday. Poster size: width - no wider than 3 feet (91 cm)
height - no longer than 5 feet (152 cm)

SESSION 1: Sea ice highlights session (Conveners: Don Perovich and Torge Martin)

09:30 09:45 Don Perovich (CRREL, USA) or **Torge Martin** (UW, USA): *"2013 and 2014 sea ice conditions and results of 2013 sea ice outlook"*

09:45 10:00 Pam Posey et al. (NRL, USA): *"An Assessment of the Navy's Sea Ice Outlook Predictions for 2014"*

10:00 10:15 Sinead L. Farrell et al. (University of Maryland, USA*): Interannual variability in contemporaneous measurements of Arctic snow and sea ice thickness from airborne altimetry*

10:15 10:30 Coffee

SESSION 2: Sea ice modeling and observations (Conveners: Andrew Roberts and Daniel Lee Feltham**)**

10:30 10:45 Daniel L. Feltham et al. (University of Reading, UK*): September Arctic sea ice minimum predicted by spring melt pond fraction*

10:45 11:00 David Hebert (NRL, USA): *Effects of Sea ice surface roughness on remotely sensed thickness values*

11:00 11:15 Tremblay, Bruno (McGill University, Canada): Forecasting future sea ice conditions in the MIZ: a Langrangian approach

11:15 – 11:30 Pierre Rampal and S. Bouilon (Nansen Center, Norway): *Towards a new sea ice model: neXtSIM*

11:30 – 11:45 Andrew Roberts (NPS, USA*): Intercomparison of isotropic and anisotropic sea ice mechanics in a high-resolution fully coupled climate model*

11:45 – 13:15 Discussion: New approaches for sea ice modeling, observations and predictions (Moderators: Andrew Roberts, Daniel Feltham, Torge Martin and Don Perovich)

13:15 – 13:45 Lunch (provided)

13:45 – 15:30 One-slide poster summary presentations (1 minute per presentation: please provide your slide for these presentations by October 18th, 2014)

15:30 – 16:00 Moving to Quissett campus, Clark 507 for POSTER Session)

SESSION 3: Poster session (Quissett campus, Clark 507, see map)

16:00 – 17:30 Poster session 1 (Quissett campus, Clark 507)

17:30 – 19:30 Reception and poster session (Quissett campus, Clark 507)

Thursday, October 23, 2014

Redfield auditorium on Water Street in Woods Hole

8:15 8:30 Coffee

SESSION 4: Ocean modeling and observations #1 (Conveners: Yevgeny Aksenov and Ben Rabe)

08:30 08:45 Summary of "Sea Ice" poster session (Andrew Roberts, Daniel Feltham and Torge Martin)

08:45 09:00 Summary of "Ocean modeling and observations 1" poster session

09:00 09:15 Timmermans, Mary-Louise et al. (Yale University, USA): Mechanisms of Pacific Summer Water variability in the Arctic's Central Canada Basin

09:15 09:30 Curry, Beth et al. (University of Washington, USA): Arctic Outflow West Of Greenland: Nine Years Of Volume And Freshwater Transports From Observations In Davis Strait

09:30 09:45 Isachsen, Pål Erik (Norwegian Meteorological Institute, Norway): Baroclinic instability and the mesoscale eddy field in the Arctic Ocean: a model study

09:45 10:00 Luneva, Maria (National Oceanography Centre, Liverpool, UK): *The effects of tides on the water mass mixing and sea ice in the Arctic Ocean*

10:00 10:15 Coffee break

10:15 11:45 Discussion: Currents, eddies, tides and mixing. (Moderators (to be confirmed): Sheldon Bacon and Pål Isachsen)

SESSION 5: Ecosystem and biogeochemical modeling (Conveners: Katya Popova and Paul Wassmann)

11:45 12:00 Summary of ecosystem and biochemical modeling poster session

12:00 12:15 Wassmann Paul et al. (UiT Norway´s Arctic University, Norway): *Physical constrains of productivity in the Arctic Ocean: the trajectories into the future?*

12:15 12:30 Yoonjoo Lee et al. (Bigelow Laboratory for Ocean Sciences, USA): *Primary production algorithm Round Robin for the Arctic Ocean: Preliminary results*

12:30 13:00 Lunch (provided)

13:00 13:15 Samuel Laney (WHOI, USA): *Year-long, daily-scale bio-optical observations under perennial ice cover in the Arctic Ocean*

13:15 13:30 Nicole Jeffery (Los Alamos National Laboratory, USA**):** *Modeling arctic sea ice biogeochemistry throughout the ice interior*

13:30 – 15:00 Discussion: Major challenges for biogeochemical modeling and observations: what is needed to improve both observing systems and models including coordinated experiments.**(**Moderators: Katya Popova and Paul Wassmann)

15:00-15:15 Coffee break

SESSION 6: Ocean modeling and observations #2 (Conveners: Mike Steele and Mary-Louise Timmermans)

15:15 15:30 Summary of "Arctic Ocean from models and observations #2" poster session

15:30 15:45 Thomas Armitage (University College London, UK): *Sea level in the Arctic Ocean from ERS, Envisat and CryoSat-2 satellite radar altimeters*

15:45 16:00 Paul Myers (University of Alberta, Canada*): Effects of enhanced Greenland melt on the hydrography of Baffin Bay and the water exchanges between the Arctic and Atlantic Ocean*

16:00 – 16:15 Dominic DiMaggio (NPS, USA): *The Role and Variability of Ocean Heat Content in the Arctic Ocean: 1948-2009*

16:15 16:30 Sylvia Cole (WHOI,USA): *The ocean's response to spring and summer melting*

16:30 – 18:00 Discussion: Major uncertainties in understanding of drivers of oceanic climate states and changes in freshwater and heat content. Coordinated experiments (Moderators: M-L Timmermans and Mike Steele)

18:05 Bus to Clark building

18:30 20:30 Workshop working reception #2 and continuation of poster session in Clark 507

20:45 Bus to hotels

Friday, October 24, 2014

Redfield auditorium on Water Street in Woods Hole

8:15 8:30 Coffee

SESSION 7: 2013-3014 FAMOS Coordinated Experiments: (Conveners: Andrey Proshutinsky and TBD**)**

08:30 08:40 Proshutinsky: tasks for coordinated working group sessions

08:40 08:50 Popova Ekaterina and Paul Wassmann: Ecosystem and biogeochemistry coordinated field and numerical experiments and publications for FAMOS JGR special collection (working group 1)

08:50 09:00 Sheldon Bacon (NOC, Southampton, UK): Freshwater and heat content coordinated field and numerical experiments and publications for FAMOS JGR special collection (working group 2)

09:00 09:10 Aksenov Yevgeny (NOC Southampton, UK): Arctic circulation coordinated field and numerical experiments and publications for FAMOS JGR special collection (working group 3)

09:10 09:20 John Toole (WHOI, USA): Coordinated mixing field and numerical experiments and publications for FAMOS JGR special collection (working group 4)

09:20 09:30 Torge Martin and Andrew Roberts: Coordinated field and numerical sea ice experiments and publications for FAMOS JGR special collection (working group 5)

09:30 09:40 Bruno Tremblay: Coordinated field and numerical landfast ice experiments and publications for FAMOS JGR special collection

09:40 10:00 Helge Goessling (Polar Prediction Project International Coordination Office, AWI, Germany): The Polar Prediction Project Year of Polar Prediction

10:00 10:15 Coffee break

10:15 10:25 Mary-Louise Timmermans: Summary report of FAMOS outcomes for BAMS State of the Climate

10:35 11:35 Coordinated experiments working groups meetings

11:35 12:30 Plenary session with reports

12:30 Final remarks and workshop adjourn

SESSION 3: POSTERS (will be displayed from **15:00 to 19:30 in Clark 507 on Wednesday, October 23, 2014** and from **18:15 to 20:30 in Clark 507 on Thursday, October 24, 2014)**

A. Sea ice

A1. Bouchat, Amélie, McGill University, Canada: Using sea-ice deformation distributions to constrain sea-ice dynamic models

A2. Bouillon, Sylvain, Nansen Environmental and Remote Sensing Center, Norway: On computing noise-free sea ice deformation fields from SAR-derived sea ice motion

A3. Close, Sally, LOCEAN, Université Pierre et Marie Curie, France: Large-scale patterns of Arctic sea ice variability and links to climatic forcing

A4. Dupont, Frederic, MSC, Environment Canada, Canada: Updates on ice-ocean coupling in the Canadian CONCEPTS 1/12th degree regional modelling system

A5. Feltham, Daniel et al., Centre for Polar Observation and Modelling, University of Reading, UK: A new parameterisation of frazil and grease ice formation in a climate sea ice models

A6. Daniela Flocco et al., Centre for Polar Observation and Modelling, University of Reading, UK: The impact of refreezing melt ponds on Arctic sea ice thinning

A7. Hata, Yukie, McGill University, Canada: Anisotropic Internal Thermal Stress in Landfast Sea Ice from the Canadian Arctic Archipelago

A8: Lee Sanggyun and Im Jungho, Ulsan National Institute of Science and Technology, Korea: Estimation of Arctic Sea Ice Freeboard and Thickness Using CryoSat-2

A9. Lecomte, Olivier, Earth and Life Institute (ELI), Université catholique de Louvain (UCL), Belgium: Influence of snow processes on sea ice: a model study

A10. Martin, Torge (Polar Science Center and UW) and Lars H. Smedsrud: On modeling a variable lead closing parameter: Do we need to explicitly simulate grease ice in climate models?

A11. Martin, Torge (Polar Science Center, UW) and Michel Tsamados, and Daniel Feltham: The effect of variable sea ice drag on optimal ice concentration for momentum transfer into the ocean

A12. Mueller, Bennit, University of Victoria, Canada: Detection and attribution of Arctic sea ice change causes

A13: Petty, Alek, NOAA, USA: Seasonal trends in sea ice dynamics and wind forcing over the Beaufort Sea

A14. Plante, Mathieu, McGill University, Canada: Formation and break up of the Laptev Sea landfast ice.

A15. Steele, Michael, University of Washington, USA: Arctic seasonal sea ice retreat: synchronicity, prediction, and dilation

A16. Thomas, Sam, Centre for Polar Observation & Modelling (CPOM) / University College London, UK: Changing sea ice conditions in the Beaufort Sea – latest results from Ice Watch observations on the 2014 JOIS/BGEP cruise

A17. Tilling, Rachel, University College London, UK: Arctic sea ice thickness and volume 2010-2014 from CryoSat-2

A18. Withdrawn (this now is an oral presentation) Tremblay, Bruno, McGill University, Canada: Forecasting future sea ice conditions in the MIZ: a Langrangian approach

A19. Tsamados, Michel, University College London, UK: Processes controlling surface, bottom and lateral melt of Arctic sea ice in a state of the art sea ice model

A20. Webster, Melinda, University of Washington, USA: A Comparison of Melt Pond Evolution in the Beaufort and Chukchi Seas

A21. Williams, James, McGill University, Canada: Marginal Ice Zone Buoy Forecasts: a Model Comparison

A22. Hezel, Paul, University of Bergen, Norway: Arctic summer sea ice decline in CMIP5

A23. Rynders, Stefanie et al. University of Southampton, UK: Implementation of a Combined Elastic-Viscous-Plastic and Collisional Sea Ice Rheology

A24. Selyuzhenok, Valeria, Alfred-Wegener-Institute Helmholtz-Centre for Polar and Marine Research, Germany: Mechanisms of landfast sea ice development in the southeastern Laptev Sea

A25. Yang, Qinghua, National Marine Environmental Forecasting Center of China and Ocean University of China: Assimilating SMOS sea ice thickness into a coupled ice-ocean model using a local SEIK filter

A26. Maslowski, Wieslaw, Naval Postgraduate School, USA: Sensitivity of sea ice states to variable parameter space in the Regional Arctic System Model (RASM)

A27. Tsukernik, Maria et al., Brown University, USA: The great Arctic cyclone of 2012: influences of the underlying surface

A28. Aksenov et al. National Oceanography Centre, UK: Predicting the Arctic Ocean Environment

A29. DeRepentigny, Patricia, McGill University, Canada: Finding the source regions of sea ice melting in the marginal ice zone

B. Ocean from models and observations #1

(Large-scale processes)

B1. Aksenov, Yevgeny, **et al.,** National Oceanography Centre, UK: Pathways, variability and Modification of the Arctic Atlantic water in the model inter-comparison experiment

B2. Golubeva, Elena and D.Yakshina, Institute of Computational Mathematics and Mathematical Geophysics, Russia, Sensitivity of the Arctic-North Atlantic numerical model to the mixed layer parameterization

B**3. Herbaut, Christophe** LOCEAN, France, Origin and fate of the AW anomalies in the Arctic from tracer experiments

B4. Houssais, Marie-Noelle LOCEAN-Universite Pierre et Marie Curie, France: Marie-Noelle Houssais and Christophe Herbaut: Atlantic water transports to the Arctic from hindcast simulations

B5. Long, Zhenxia Bedford Institute of Oceanography, Canada: Air-sea interactions in the Barents Sea and Atlantic water layer in the central Arctic Ocean

B6. Rudels, Bert et al, Finish Meteorological Institute, Finland: Atlantic inflows, the Arctic Ocean volume and freshwater balances, and the Fram Strait branch contribution to the Arctic heat budget

B**7. Smedsrud, Lars H.** University of Bergen, Norway: Atlantic inflow and sea ice in the Barents Sea and Arctic Ocean

B**8. Nguyen, An** Massachusetts Institute of Technology, USA: Arctic and sup-polar gyre state estimate.

B9. Carton, James University of Maryland, USA: Arctic weather and heat content of the Nordic Seas: CMIP5 historical simulations

B10. Dukhovskoy, DS., M.A. Bourassa, and A. Proshutinsky, Florida State University, USA: Relation between the Large-Scale Atmospheric Variability and Ocean Circulation in the Nordic Seas

B11. Dukhovskoy, DS., A. Proshutinsky, and M.-L. Timmermans**,** Florida State University**,** USA: Freshwater pathways in the Nordic Seas from the Greenland Freshwater Experiment

B12. Grivault, Nathan University of Alberta, Canada: Baffin Bay transports and budgets from a suite of numerical modelling experiments

B13. Holt, Jason National Oceanography Centre, UK Challenges in coupled ocean-shelf modelling in the Arctic and North Atlantic context

B14. Ilicak, Mehmet Uni Research, Norway: Intercomparison of Arctic Ocean

hydrography, heat and salt fluxes in IPCC type global coupled ocean/sea-ice models using CORE-II forcing

B15. Kwon, Mi Ok and Ho Ji Lee Korea Maritime and Ocean University: Numerical Experiment of Tidal Effect on the Arctic Ocean Using an Ice-Coupled Ocean Model

B16. Nummelin, Aleksi University of Bergen & Bjerknes centre for climate research: Arctic Ocean water masses under changing river runoff

B17. Bacon, Sheldon National Oceanography Centre, UK: Arctic freshwater and heat fluxes: variability, and assessment

B18. Proshutinsky, Andrey Woods Hole Oceanographic Institution, USA: Causes and consequences of the Beaufort Gyre freshwater storage variability

B19. Schulze, Lena, Eleanor Frajka-William and Sheldon Bacon**,** National Oceanography Center Southampton, UK: Freshwater changes and pathways in the Labrador Sea

B20. Stroh, Jacob N. International Arctic Research Center (IARC) / University of Alaska Fairbanks (UAF): Sea-surface temperature and salinity product comparison against external in situ data in the Arctic

B21. Benjamin Rabe (Alfred Wegener Institute, Germany): *Upper Arctic Ocean changes since the 1990s: freshwater, stratification and implications for biogeochemistry*

B22. Cabrillo, Raquel Somavilla Alfred Wegener Institute, Germany Convection changes in the Greenland Sea since the 1980s: Causes and consequences.

B23. Paquin, Jean-Philippe, Dalhousie University, Canada, Analyses of Canadian CONCEPTS Regional 1/12-deg and ¼-deg simulations during 2003-2011

B24. Zhang, Yu et al. University of Massachusetts, Dartmouth, USA: Long-term Variability of the Canadian Arctic Archipelago Outflow and Its Impacts on the Arctic Basin-Scale Circulation

B25. Ding, Yanni, University of Maryland, USA: Atmosphere-Ocean-Sea ice interaction on Arctic Ocean in CMIP5 simulations

C. Ecosystem and biogeochemical modeling

C1. Deal, Clara, University of Alaska Fairbanks, USA: Changes in Arctic marine dimethylsulfide with sea ice loss

C2. Duarte, Pedro, Norwegian Polar Institute, Norway: The (lack of) consensus in modeling marine biogeochemistry in the Arctic

C3. Ha, Ho Kyung, Inha University, Korea: Measurement of suspended particulate matter under sea ice using ADCP and LISST

C4. Jin, Meibing, International Arctic Research Center, USA: Evaluating CICE5 model with long term observations of snow, ice and biological data off Barrow

C5. Lawrence, Jonathan, National Oceanography Centre, Southampton, UK: Investigating Arctic subsurface primary production in a model: where, when, how much, and does it matter for satellite primary production estimates

C6. Maps, Frederic, Université Laval, Canada: Tackling the challenges of Modelling the *Calanus* complex in rapidly changing Arctic and sub-Arctic seas.

C7. Record, Nicholas, Bigelow Laboratory for Ocean Sciences, USA : Predicting the biogeography of copepodid diapause

C8. Rosenhaim, Ingrid Linck, Alfred-Wegener Institute, Germany: Modeling the distribution of the ballast water discharge in the Arctic Ocean

C9. Ashjian Carin et al. Woods Hole Oceanographic Institution, USA: Inter-annual and Shorter-Term Variability in Physical and Biological Characteristics across Barrow Canyon in August – September 2005-2013.

D. Ocean from models and observations #2 (Meso- & small-scale processes)

D1. Ashik, Igor Arctic and Antarctic Research Institute, Russia: Extreme Sea Level Changes in the Arctic Seas and their long-term changes

D2. Dewey, Sarah Polar Science Center, UW-APL, USA: Aerial Surveys of the Beaufort Sea Seasonal Ice Zone in 2012

D3. Piacsek, Steve Naval Research Laboratory, Stennis Space Center, USA: Arctic – GIN Sea Deep Water Passages in the FRAM Strait

D4. Platov Gennady et al., Institute of Computational Mathematics and Mathematical Geophysics, Russia: The coupled hydrodynamic system of Lena River delta and Laptev Sea shelf zone: problems of modeling and observational synthesis

D5. Carroll, Dustin University of Oregon, USA: Numerical simulation and sensitivity analysis of subglacial meltwater plumes: implications for ocean-glacier coupling in Rink Isbrae, west Greenland

D6. Cenedese, Claudia Woods Hole Oceanographic Institution, USA: Laboratory Experiments Investigating the Influence of Multiple Subglacial Discharges on Submarine Melting of Greenland's Glaciers

D7. Olsen, Steffen Danish Meteorological Institute, smo@dmi.dk, Denmark: Variability of the Arctic Ocean freshwater storage in a coupled climate model

D8. Davis, Peter University of Oxford, UK: The effect of increased background mixing on the cold halocline of the Arctic Ocean

D9. Meri Korhonen, Finland Meteorological Institution, Finland: The problems and possibilities in identifying the evolution of the Winter Mixed Layer during melt season from the ITP observations

D10. Marcinko, Charlotte National Oceanography Centre, UK: Characterising Energy Spectra in the Arctic Ocean Halocline

D11. Plueddemann, Albert Woods Hole Oceanographic Institution, USA: Eddies in the Western Arctic Halocline

D12. Zhao, Mengnan Yale University, USA: Structure and Dynamics of the Mesoscale Eddy Field in the Arctic Ocean's Halocline.

D13. Chepurin, Gennady, University of Maryland, USA: Anomalous warming of the Barents Sea in summer 2013

D14. Bradley, Alice, CCAR, CU Boulder, USA: Observations of Wind-Driven Processes In The Surface Layer Of The Marginal Ice Zone

D15. Holdsworth, Amber University of Alberta, Canada: The Influence of High Frequency Atmospheric Forcing on the Circulation and Deep Convection of the Labrador Sea

D16. Panteleev, Gleb et al., International Arctic Research Center, USA: Analysis of the variability of the circulation in the Pacific Sector of the Arctic Ocean during 2003-2010 decade through the 4Dvar data assimilation

D17. Panteleev, Gleb et al., International Arctic Research Center, USA: Optimization of the high-frequency radar sites in the Bering Strait region

D18. Panteleev, Gleb and Max Yaremchuk**,** International Arctic Research Center, USA: Adjoint-Free Variational Data Assimilation into a Regional Models

D19. Francis, Oceana et al., University of Hawai, USA: Toward a better hindcast/forecast of waves in the Arctic Ocean

D20. Hosekova, Lucia, et al., National Oceanographic Center, UK: Modelling Ocean Surface Waves in Polar Regions

D21. Dosser, Hayley University of Washington, USA: Impact of Declining Sea Ice on Wind Generated Near-Inertial Internal Waves and Implications for Mixing and Vertical Heat Flux

D22. Shimada, Koji, Tokyo University of Marine Science and Technology, Japan: Retarded responses of the oceanic Beaufort Gyre to winds and sea ice motions: Influences on variations of sea ice in the Pacific sector of the Arctic Ocean CMIP5

D23. Zhang, Weifeng Woods Hole Oceanographic Institution: The Dispersal of Dense Water Formed in a Coastal Polynya on a Shallow Sloping Shelf

D24. Torres, et al. (WHOI, USA): Observations of the upper ocean flow field and sea ice dynamics in the Beaufort Gyre from 2005-2013 from moored instrumentation

D25. Gelderloos, Renske, University of Oxford, UK: A simple model of Nares Strait throughflow

D26. Bhatrasataponkul, Tachanat, Florida State Univerity, USA, Variability of Turbulent Heat Flux Estimates in the Nordic Seas

D27. Albretsen Jon et al., Institute of Marine Research, Norway: Recirculation in the Fram Strait: Transport and dynamics based on observations and eddy-resolving modeling