University of Reading

JOB DESCRIPTION

Vacancy reference:	SRF29927
Post Title:	Postdoctoral Researcher
Grade:	Grade 6
School/Department:	School of Mathematical, Physical and Computational Sciences/Department of Meteorology
Reports to:	Prof. Daniel Feltham
Responsible for:	none

Purpose

Develop and use an Arctic sea ice-ocean model to assess the role of sea ice break up and fragmentation in sea ice evolution and decline, test model using observed sea ice products, examine feedbacks associated with an increased extent of marginal and seasonal ice, and perform and analyse climate simulations containing advanced representations of sea ice.

Main duties and responsibilities

The strong decline of Arctic sea ice in the last decade is a conspicuous indicator of climate change, with impacts on the Arctic environment, the insurance, shipping and oil industries, local populations, and remote weather. The reduced sea ice cover exposes greater areas of the ocean to the atmosphere, and intensifies and prolongs air-ocean exchanges of heat, moisture, and momentum, altering the circulation and properties of air, ocean, and ice. Observations show that the Marginal Ice Zone (MIZ), a region of low ice area concentration consisting of a disperse collection of small sea ice floes, has grown. Model projections indicate a growth of the MIZ from around 10% (now) to 80% of the summer sea ice cover by 2050, i.e. the ice cover will become marginal.

Our overall project hypothesis is that: as the ice cover becomes marginal, feedbacks between the air, ice, and ocean will strengthen, and these strengthened feedbacks will substantially affect the circulation and properties of the sea ice, upper ocean, and atmosphere. We further speculate that more faithful representation of marginal sea ice processes in climate models will result in earlier climate projections of an ice-free Arctic.

The main duties to be performed are:

- Perform sea ice-ocean simulations and constrain model uncertainty with emerging data on floe size and wave height.
- Quantify new and strengthened ice-ocean-atmosphere feedbacks associated with an altered MIZ and assess their impacts in a series of simulations using models of increased complexity.
- Perform climate model projections, analyse simulation results, and assess how MIZ process physics affects climate model simulations of the Arctic.

The post-holder will also:

- Ensure relevant data is made available for the wider community to analyse;

- Actively engage with the project partners across the UK and build international collaborations;
- Report on progress and results through appropriate methods, including papers for submission to scientific journals, presentation of results at conferences/workshops, and presentations to the general public (when appropriate);
- Maintain awareness of current progress in relevant research areas, to ensure that the research remains at the cutting edge;
- Contribute to the maintenance of an active scientific environment through group meetings, departmental seminars etc.;
- Provide input to development of proposals for further research funding;
- Contribute to activities such as data visualisation, training, public engagement, knowledge exchange and policy advice, where appropriate.

Supervision received

General and specific guidance from Prof. Daniel Feltham and Dr. Nicholas Klingaman. Supervision of some technical aspects to be delegated to other members of Prof. Feltham's research team.

Supervision given

The post-holder has no formal supervision responsibilities however opportunities may become available for involvement in supervision of post-graduate research students.

Contact

Collaborate with the multi-institutional research team, and in particular researchers in the Centre for Polar Observation and Modelling at the University of Reading and University College London, the National Centre for Atmospheric Science, the National Oceanographic Laboratory, and the Scottish Association for Marine Science. Collaborate with project partners in the Met Office, University of Washington, and the Los Alamos National Laboratory.

Terms and conditions

This is a full-time post for a fixed term up to 18 months from the start date. Part-time and flexible work patterns considered. There are no specified hours of work, but you will be required to work such hours as are necessary to carry out the duties associated with the post. Overtime is not payable.

The post-holder will be expected to present results of work at national and international conferences, as well as participate in project meetings as required.

This document outlines the duties required for the time being of the post to indicate the level of responsibility. It is not a comprehensive or exhaustive list and the line manager may vary duties from time to time which do not change the general character of the job or the level of responsibility entailed.

Date assessed:

5/8/2019

PERSON SPECIFICATION

Job Title	School/Department
Postdoctoral Researcher	**Department of Meteorology**

Criteria	Essential	Desirable
Skills Required	• Significant skills in numerical modelling of physical systems using complex computer codes • Ability to manipulate and visualise large gridded datasets, such as climate model output • Ability to formulate, under guidance, new representations of physical processes in mathematical form • Ability to modify complex computer codes with technical and physical consistency • Ability to interpret model simulations using understanding of the physical systems and observations, and analyse implications • Attention to detail • Ability to work independently for long periods • Effective time management skills • Ability to work with a diverse team • Ability to give presentations • Ability to write viable scientific publications	• Skill with climate model sea ice models such as CICE • Skills at coupling numerical models • Skills with model initialisation including grid generation, initialisation, selection and application of forcing data sets
Attainment	• PhD or equivalent in physical environmental science including at least one year of numerical modelling experience	

Knowledge	• Principles of physical fluid dynamics • Working knowledge of, and mathematical representation of, heat, mass, and momentum transfer	• Sea ice thermodynamics and dynamics • Knowledge of physical climate system
Relevant Experience	• PhD level of research experience in a numerical, physical subject area	
Disposition	• Willingness to collaborate with other members of the research team	• Friendly and helpful attitude
Other	• Willingness to present at national and foreign science conferences	
Completed by: Daniel Feltham		Date: 31/7/2019