JULES in CEH

Richard Harding +

JULES Launch 2 October 2006



CEH Science programmes:

WATER:

UK hydrological models for flood and resource management

BIODIVERSITY

BIOGEOCHEMISTRY





Nimrod – real time hydrology



Surface Runoff



The Grid-to-grid flow-routing model ("G2G")

- The G2G now operates 'offline' at a 1 km resolution across the UK and Northern France
- A 25 km version has been included in the Unified Model (UM6.0) for modelling river flow over Europe
- Plans to include groundwater



This research is part of a collaboration with the Hadley Centre, funded by DEFRA



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BIODIVERSITY

Hydrological impacts and carbon accumulation in energy crops

BIOGEOCHEMISTRY



HIECroP - historic crop water use and carbon production: 1960-2000 implmentation





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CLIMATE Change Theme

Modelling ozone fluxes and upscaling to the UK

Carbon catchments



CEH Climate Change Theme

Theme CC01B. Land-surface Feedbacks in the Climate System

aims to quantify land-surface feedbacks in the climate system through energy, water and carbon cycle feedbacks, and improve the representation of the key processes in land-surface and Earth System models.



Core Programme

Datasets for land-surface science

Gridded estimates of fluxes across W. Africa Global and regional datasets for forcing and validation of JULES Datasets of forest fires and other disturbances from remote-sensing Datasets of vegetation phenology from remote-sensing

Development of the JULES land-surface model

Coordination of JULES community activity Modularisation, code maintenance and development of interfaces to ESMs Improved treatment of hydrological and soil biogeochemical processes Incorporation of interactive nitrogen cycling



Research programme

Land carbon cycle feedbacks on climate change

Coupled land carbon cycle-climate modelling including uncertainty analysis

Assessment of sensitivity of Tropical and Boreal forests to climate change

Land-surface feedbacks through energy and water cycles

Quantification of feedbacks between the water and energy exchange and the response to expected changes in climate.

Assessment of the impact of improved land-surface descriptions on the simulation of water energy and carbon exchange in Africa.

New climate and hydrological simulations for Boreal regions with improved representation of snow, soil processes and vegetation dynamics





r^2 July NDVI and antecedent precip



Compare global JULES simulation of soil water stress with areas of significant correlation between NDVI and antecedent precip

a perfect model would show no pixels in lower panel when beta=1 (ie unstressed, pink in top panel)

Globally v encouraging agreement, model simulates beta less than 1 in regions where NDVI is correlated with precip



Climate and Land-Surface Systems Interaction Centre



WATCH IP: calculating the impact of climate change on runoff





Contributions to JULES



