THE C20C+ DETECTION AND ATTRIBUTION PROJECT
CASCADE
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A CLIMATE PRODUCT FOR UNDERSTANDING EXTREMES

Current status of “event attribution” research
While there is a growing research effort to assess the degree to which recent extreme weather events relate to historical anthropogenic emissions, understanding of the sensitivity of results to aspects of the experimental setup and the characterisation of the event remain poorly understood, in part due to a lack of an adequate data product.

Undertaken as a collaboration within the International CLIVAR C20C+ Project, managed by LBNL with data portal services provided by NERSC.

LARGE ENSEMBLE MODELLING TO SAMPLE RARE EVENTS

Each atmospheric climate model will be run under two scenarios:
• an “All-Hist” scenario designed to describe the climate over recent decades
• a “Nat-Hist” scenario designed to describe what the climate might have been like over recent decades had anthropogenic emissions never occurred

The International CLIVAR C20C+ Detection and Attribution Project
Goal is to conduct modelling in support of research and analysis of the detection and attribution of changes in weather extremes.
In particular, in aims to support:
• Characterisation of historical trends and variability in the probabilities of damaging weather events, including the differences across climate models
• Estimation of the fraction of the historical, present, and future chance of damaging weather events that is attributable to anthropogenic emissions, and characterisation of underlying uncertainties in these estimates

Pilot study: Okavango Delta flooding, Botswana, 2009-2011
Global atmosphere/land models:
1. HadAM3P-N96
2. CAM5-1.2degree
Statistical downscaling:
SOM-D
River basin model:
P. Pitman model

UNDERSTANDING EXTREMES IN A CHANGING CLIMATE

First results from CAM5.1-1degree simulations
California daily temperature
Dots: daily values, Lines: 1-in-1-year event

California hydrological-year precipitation
Dots: annual values, Lines: 1-in-10-year event

INFORMATION, DATA, AND COLLABORATION

Data distribution
• Diagnostic output available on the ESGF (http://esgf.nersc.gov) under project “c20c”.
• Output needed for dynamical downscaling archived on tape

FOR MORE INFORMATION: http://portal.nersc.gov/c20c

CONTRIBUTIONS OF DATA, ANALYSES, ETC. ARE INVITED AND WELCOME!

MULTIPLE MODELS IN SUPPORT OF UNDERSTANDING AND ASSESSMENT

Participating models
Simulations with at least a dozen models are being run or are scheduled to start running during 2014:
• global atmosphere/land
• regional dynamical atmosphere/land
• statistical downscaling
• river basin

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