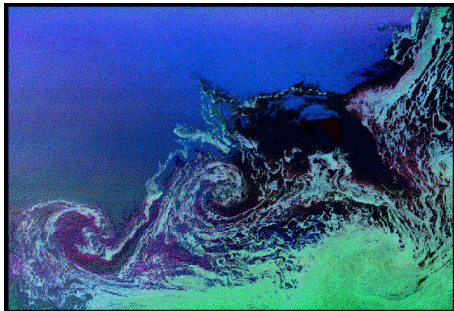
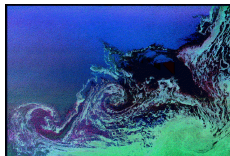


# CLIVAR WGOMD Mesoscale Eddy Workshop

UK Met Office, Hadley Centre  
27-29 April 2009



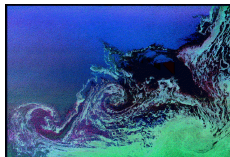
# Motivation for this workshop



- Ocean mesoscale eddies are important for climate and intellectually rich.
- Those doing research related to mesoscale eddies are **superb individuals** who enjoy discussing and debating interesting and tough issues.
- It has been nearly 20 years since the publication of two seminal papers on mesoscale eddy parameterization:
  - Gent and McWilliams (1990)
  - Greatbatch and Lamb (1990)
- The year 2008 saw the passing of one of our greatest and most gracious colleagues: Peter Killworth.
  - Special edition of *Ocean Modelling* in honour of Peter Killworth; articles due 30 June.



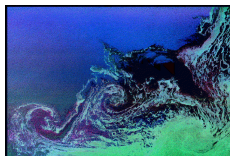
# Workshop goals



- **To educate** the research community (including students) regarding the importance of mesoscale eddies in the World Ocean, and correspondingly for establishing features of the ocean climate system;
- **To identify best practices** for parameterizing ocean mesoscale eddies in coarse resolution climate models, and to discuss various research avenues for improved parameterizations;
- **To evaluate** the ability of state-of-the-science numerical models to accurately represent the ocean mesoscale in eddying simulations.

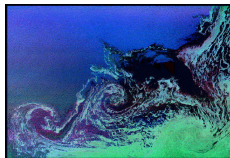


# Workshop format



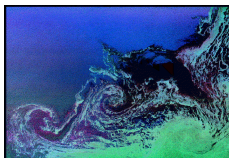
- 70minutes per speaker, including questions and discussion.
- Presentations aim to weave together multiple strands of ongoing research.
- Speakers should provide candid and critical comments on various research avenues, not being shy about provoking healthy discussion and debate.
- Presentations should be given in a pedagogical style.
- An impressive array of posters are for viewing between the presentations and during breaks.





- Interactions, networking, and education
- Presentations will be posted on WGOMD web site for future reference.
- There are plans for special edition of *Ocean Modelling* in 2010 focusing on mesoscale eddies. To be announced in near future.

# Thanks to the following



- **Special people**

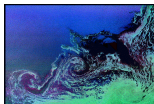
- Helene Banks and Malcolm Roberts: for kindly hosting us
- Lesley Challenger, communications coordinator of the Met Office: for organizing nearly everything!
- Anna Pirani, CLIVAR: for coordination and for obtaining extra funding.

- **Special organizations**

- UK Met Office: workshop venue
- NOAA, NSF, and NASA: for sponsoring 13 young scientists who have brought posters to the meeting.
- CLIVAR Working Group for Ocean Model Development (WGOMD): for providing scientific organization



# WGOMD: who are we?



## ● Active members

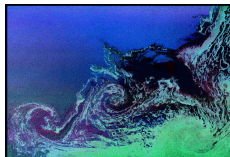
- Helene Banks (co-chair retiring): Met Office Hadley Centre
- Stephen Griffies (co-chair retiring): NOAA/GFDL
- Helge Drange (co-chair): University of Bergen, Norway
- Gokhan Danabasoglu (co-chair incoming): NCAR
- Matthew England: University of New South Wales
- Richard Greatbatch: Leibniz-Institut für Meereswissenschaften
- Gurvan Madec: LODYC, Institute Pierre Simon Laplace
- Anna Pirani: CLIVAR Project Office and Princeton University
- Hiroyuki Tsujino: Japan Meteorological Agency

## ● Those who just keep hanging on

- Claus Böning: Leibniz-Institut für Meereswissenschaften
- Eric Chassignet: Florida State University
- Rüdiger Gerdes: Alfred Wegener Institut für Polar- und Meeresforschung
- Anne Marie Treguier: Laboratoire de Physique de Océans



# WGOMD Workshops: past, present, and future

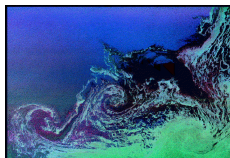


- **State of the Art in Ocean Climate Modelling** : June 2004, Princeton/GFDL.  
[www.clivar.org/organization/wgomd/wgomd5/gfdl104.php](http://www.clivar.org/organization/wgomd/wgomd5/gfdl104.php)
- **Modelling the Southern Ocean** : November 2005, Hobart Australia.  
[www.clivar.org/organization/wgomd/wgomd6/so\\_model.html](http://www.clivar.org/organization/wgomd/wgomd6/so_model.html).
- **Numerical Methods in Ocean Models** : August 2007, Bergen Norway.  
[www.clivar.org/organization/wgomd/nmw/nmw\\_programme.php](http://www.clivar.org/organization/wgomd/nmw/nmw_programme.php).
- **Ocean Mesoscale Eddies: Representations, Parameterizations, and Observations** : April 2009, Hadley Centre, UK.
- Late 2010: NCAR, Boulder USA. TBA.





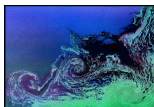
# Workshop Logistics



- Speakers for the day please upload your talks to the common laptop during a break prior to your presentation. If you have animations...then test your laptop prior to talk.
- All lunches and teas are outside the conference room on the balcony.
- Icebreaker and full buffet dinner on Monday evening
- Drinks and nibbles on Tuesday evening
- Coash rides back to city arranged for Monday and Tuesday evening after the social events.
- Posters to be displayed on numbered boards. No special poster session, but plenty of time between sessions (40+ posters).
- No wireless, but 2 PCs available for those needing connections during the day.



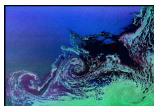
# Day 1: Observing and simulating the ocean mesoscale



- 0850:0900: **Stephen Griffies** (GFDL): Welcome and introduction
- 0900-1010: **Carl Wunsch** (MIT): Observations, simulations, and assimilations
- 1010-1120: **Dudley Chelton** (Oregon State): Global mesoscale eddy variability from satellite altimeters
- 1120-1230: **Matthew Hecht** (Los Alamos): POP simulations in an eddying regime
- 1230-1330: **lunch**
- 1330-1440: **Steve Rintoul** (CSIRO): Mesoscale processes in the Southern Ocean
- 1440-1550: **Malcolm Roberts** (UK Met Office Hadley Centre): Impacts of the mesoscale on coupled phenomena
- 1550-1700: **Frank Bryan** (NCAR): Tracer Transport in Eddy Resolving Global Ocean Simulations
- **Buffet Reception held at the Met Office**



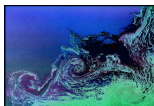
## Day 2: Parameterizing the mesoscale



- 0850-1000: **Peter Gent** (NCAR): Gent-McWilliams with 20/20 Hindsight
- 1000-1110: **Richard Greatbatch** (IFM-GEOMAR): Interpretation of mesoscale eddy mixing
- 1110-1220: **Carsten Eden** (IFM-GEOMAR): Parameterisation of mesoscale eddy mixing
- 1220-1330: **lunch**
- 1330-1440: **David Marshall** (Oxford): Parameterisation of geostrophic eddies: energetics, conservation and flow stability
- 1440-1510: **Trevor McDougall** (CSIRO): Thermodynamic Equation of State of Seawater-2010
- 1510-1620: **John Marshall** (MIT): The interplay between baroclinic instability, geostrophic turbulence and Rossby waves in the ocean (and routes to parameterisation)
- 1620-1730: **Raffaella Ferrari** (MIT): Lateral and vertical variations in eddy mixing



# Day 3: At the Frontier



- 0850-1000: **Michael Bell** (UK Met Office): Forecasting the ocean mesoscale
- 1000-1110: **Mike Spall** (WHOI): Eddies and deep water formation
- 1110-1220: **Andreas Oschlies** (IFM-GEOMAR): Eddies and ocean biogeochemistry
- 1220-1330: **lunch**
- 1330-1440: **Baylor Fox-Kemper** (Colorado): Submesoscale dynamics and parameterization
- 1440-1550: **Anne-Marie Treguier** (Brest): Anisotropy, momentum fluxes: a few remaining challenges for parameterizations
- 1550-1700: **Jim McWilliams** (UCLA): Eddy roles in the general circulation

