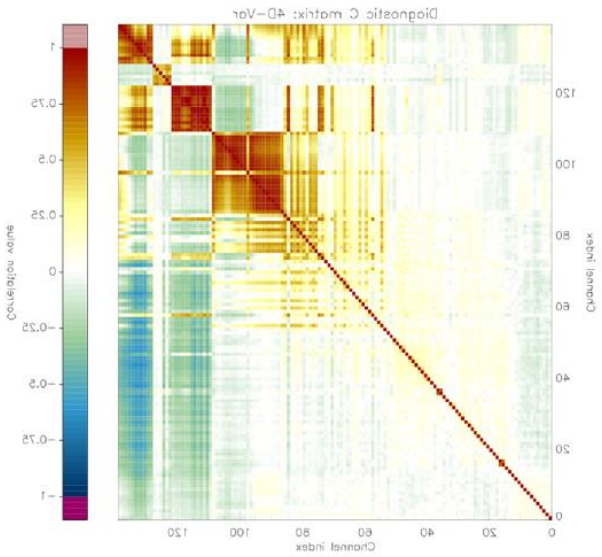
data assimilation

esa

ESA Workshop

Correlated Observation Errors in Data Assimilation



Observation Error Correlation Matrix

23 – 25 April 2014
Nike Lecture Theatre, Department of Agriculture, University of Reading

Organizers: Nancy Nichols
Sarah Dance
Joanne Waller
Zofia Stott
Bethan Perkins

National Centre for Earth Observation
NATURAL ENVIRONMENT RESEARCH COUNCIL

Assimila

University of Reading

European Space Agency Data Assimilation Projects

http://www.esa-da.org/

The Data Assimilation Projects –sponsored by ESA and managed by the UK National Centre for Earth Observation - focus on developing emerging data assimilation techniques for use with highly complex Earth system models and/or Earth observation data.

The projects are tackling a broad range of specific challenges in the field: from improving measurements of snow cover derived from satellites, to simultaneously assimilating atmospheric and oceanic data, to improving the estimates of surface vegetation and carbon fluxes.

The projects are divided into three separate initiatives:

Advanced Data Assimilation Methods
Investigating and developing advanced techniques in data assimilation

Coupled Model Data Assimilation
This project advances data assimilation techniques in fully coupled atmosphere-ocean models.

Interfacing EO data with Atmospheric and Land Surface Models
This project advances the models used in data assimilation of atmospheric composition and of land surfaces.

This workshop has been convened as part of the Advanced Data Assimilation Methods project.

Workshop objectives

The objectives of the workshop are to enable discussion and exchange of expertise on:

- Methods for finding and approximating observation error correlation matrices
- Methods for efficiently implementing correlated observation errors in data assimilation systems

and to derive better value from available observations using data assimilation.

Programme

Wednesday April 23

10.30 Registration (Tea/Coffee)

11.00 – 13.00 Session 1

11.00 Welcome and introduction - Nancy Nichols

11.15	Niels Bormann	Accounting for inter-channel observation error correlations in the ECMWF system
11.55	Ricardo Todling	Accounting for observation error correlations in the Gridpoint Statistical Interpolation system, a preliminary study
12.35	Dacian Daescu	Adjoint-based diagnosis of high-impact observation error correlations models

13.00 Lunch

14.00 - 15.30 Session 2

14.00	Gerald Desroziers	A posteriori diagnostics of correlated observation errors
14.40	Carla Cardinale	Observation influence and correlated observation
15.00	Sebastien Massart	Observation error correlation of the IASI greenhouse gases retrievals: diagnostics and impact on the analysis

15.30 Tea/Coffee

16.00 – 18.00 Session 3

16.00 Breakout groups #1

16.30 Plenary discussion from breakouts

17.00	Peter Weston	Correlated observation errors: diagnosis and treatment at the Met Office
17.40	Vincent Guidard	Evaluation of observation error correlations of hyperspectral infrared sounders in global DA and convective scale DA

19.00 Dinner: Park House

Thursday April 24

9.30 – 10.30 Session 4

09.30	Coralia Cartis	Efficient optimization algorithms for nonlinear least-squares and inverse problems
10.10	Mike Fisher	Accounting for correlated observation error in variational data assimilation

10.30 Coffee/Tea

11.00 – 13.00 Session 5

11.00	Tijana Janjic-Pfander	Treatment of representativeness error in an ensemble data assimilation system
11.40	Sarah Dance	Representativity error for temperature and humidity using the Met Office high-resolution model
12.00	Daniel Hodyss	Understanding the Error of Representation
12.40	Koji Terasaki	Data assimilations with correlated observation errors and non-orthogonal observation operator

13.00 Lunch

14.00 – 15.30 Session 6

14.00	Bill Campbell/ Liz Satterfield	An overview of recent research on correlated observation rrrors at NRL
14.30	Anthony Weaver	Examples of representing correlated observation error in variational ocean data assimilation
15.00	Anna Shlayeva	Spatial correlation of sea ice observation errors in an ensemble-variational data assimilation system

15.30 Tea/Coffee

16.00 – 18.00 Session 7

16.00 Breakout groups #2

16.30 Plenary discussion from breakouts

17.00	Eric Wattrelot	Estimates of spatial observation error correlations of radar data
17.20	Joanne Waller	Diagnosing observation error statistics for Doppler radar radial wind
17.40	Pascal Maugis/ Catherine Ottle	4D-Var assimilation of land surface temperature and spatio-temporal observation errors accounting to constrain the ORCHIDEE land-surface model

18.30 Drinks: Park House
19.15 Dinner: Park House

Friday April 25

9.30 – 10.30 Session 8

09.30	Stephanie Guedj	First estimate of observation error correlations for the future assimilation of MTG-IRS radiances
09.50	Reima Eresmaa	Implications of correlated observation error on interferometer channel selections
10.10	Luke Smallman	CARDAMOM: Global model-data-fusion estimates of terrestrial carbon fluxes

10.30 – 11.00 Coffee/Tea

11.00 – 1.00 Session 9

11.00	Stephen Ciavatta	Assimilation of ocean color to improve the simulation of marine ecosystems
11.20	Arthur Vidard	Accounting for correlated observation errors in image data assimilation

12.00 Breakout groups #3

12.30 Final Plenary discussion

13.00 Lunch

Breakout sessions

We welcome suggestions for the breakout sessions and will organize these to fit with the interests of attendees. Some suggestions:

Accounting for observation errors in data assimilation;

Diagnosing correlated observation errors;

Observation impacts with correlated observation errors.

Mathematical/numerical optimization;

Representation error;

Ensemble / Var / Hybrid techniques with correlated observation errors.

Issues associated with new/different data types;

Different types of observation errors;

Issues associated with different models - medium size eco-systems, large atmosphere-ocean systems and coupled-systems.

Delegate list

Sue	Ballard	Met Office/Reading
William	Bell	Satellite Radiance Assimilation Group, Met Office
Niels	Bormann	ECMWF
Bill	Cambell	NRL-Monterey
Carla	Cardinali	ECMWF
Coralia	Cartis	Oxford
Vincent	Chabot	INRIA – LJK France
Cristina	Charlton-Perez	Met Office
Stefano	Ciavatta	PML
Dacian	Daescu	U of Portland, USA
Sarah	Dance	Univeristy of Reading
Gerald	Desroziers	Meteo-France
Reima	Eresmaa	ECMWF
Michael	Fisher	ECMWF
Stephanie	Guedj	Météo-France/CNRS and EUMETSAT
Vincent	Guidard	Météo-France and CNRS / CNRM-GAME
Lee	Hawkness-Smith	Met Office/Reading
Daniel	Hodyss	NRL-Monterey
Katherine	Howes	University of Reading
Emily	Huichun Liu	EMCNCEP/NOAA & SRG
Tijana	Janjic Pfander	Univeristy of Muenchen
Tomas	Landelius	SMHI
Amos	Lawless	University of Reading
Dingmin	Li	Met Office
Matthieu	Lonchay	University of Liège
Matthew	Martin	Met Office
Sebastien	Massart	ECMWF
Pascal	Maugis	LSCE (catherine.ottle@lsce.ipsl.fr)
Chris	Merchant	University of Reading
Yann	Michel	Météo France and CNRS, CNRM-GAME
Stefano	Migliorini	University of Reading
Nancy	Nichols	Univeristy of Reading
Catherine	Ottle	LSCE
Bethan	Perkins	Assimila Limited
Ewan	Pinnington	University of Reading
Jonah	Roberts-Jones	Met Office
Diego	Santaren	LSCE, CEA, Saclay, France
Elizabeth	Satterfield	Naval Research Laboratory, Monterey, CA

Anna	Shlyaeva	Data Assimilation and Satellite Meteorology Research Section, Environment Canada
David	Simonin	Met Office
Luke	Smallman	University of Edinburgh
Polly	Smith	University of Reading
Boris	Snapir	Cranfield University
Laura	Stewart	Met Office/Reading
Zofia	Stott	Assimila Limited
Koji	Terasaki	RIKEN
Ricardo	Todling	NASA
Peter Jan	van Leeuwen	University of Reading
Arthur	Vidard	INRIA – France
Joanne	Waller	Univeristy of Reading
Eric	Wattrelot	Météo-France
Anthony	Weaver	CERFACS
Peter	Weston	Met Office

Useful information

Emergency contacts
Before the workshop:

Zofia Stott, +44(0)7932565822, Zof.Stott@assimila.eu

During the workshop

Bethan Perkins, +44(0)7881917520 (for administrative matters) Bethan.perkins@assimila.eu
Sarah Dance, +44(0)7729 301809 s.l.dance@reading.ac.uk

Transport in Reading
Reading local buses 20, 20A and 21 connect the campus with the town centre frequently even during weekends, the trip takes about 10 minutes. The bus stops are located in Pepper Lane (see attached map).
Alternatively taxis can be booked calling +44(0)118 9 660 660 (private company).

For those staying at Cedars Hotel, on the University Campus

Arrivals: For guests who have not stayed with us before, please note that the reception is NOT in the hotel but in the adjacent building, Park House. Please pick up your keys from Park House.

The map (attached) indicates routes to The Cedars from the main entrances and is signposted the Cedars hotel and Conference Centre. It is building 55 and Park House reception is building 8 on the campus map.

For Satellite Navigation please use RG6 6UR

Reception is situated in Park House, building number 8 on the campus map. It is open Monday to Friday 08:00 to 18:00.

Breakfast is served at Eat at Park House from 07:30 until 09:30 – (08:00 to 10:00 on Saturdays and Sundays).

Check in time is 2pm
Check out time is 10am

For out of hours:

- Check ins, please contact Campus Security using the intercom on the Cedars Hotel front door. They will allow you access to the Hotel and tell you which room are you staying in. The door to your room will be open and the room key, key-card for the front door, car park permit and free Wi-Fi access codes will be on the desk.

- Check outs, just drop your key in the black box situated on the staircase between the ground and the 1st floor. For delegates, paying their own expenses, our payment for the B&B and extras will be processed on the next working day and your invoice will be sent to you by email.

- Enquires please contact the Campus Security using the intercom or dialling 7799 from the phone in your room.

- Housekeeping services are limited during the weekends, please let us know in advance any requirements you might have such as extra towels, linen, tea bags, shower gel, etc.

- The catering services at the Whiteknights Campus are closed during the weekend except for the breakfast service. There is a pub/restaurant located very close by however called The Queens Head which has undergone recent refurbishment and offers good quality food. If you take a right out of the main Shinfield road entrance, The Queens Head is located a short two minute walk on your left.

- A convenience store called Campus Central is located in the Cedars Hotel building ground floor, is open on Saturdays from 10am until 6pm and from 11am to 4pm on Sundays.

Campus map link: http://www.reading.ac.uk/web/FILES/University-of-Reading-Whiteknights-COLOUR-ALPHA-May13.pdf