

What's past is prologue...

[Shakespeare, The Tempest]



Act 7. Adrian and the MACC generation

The Relevance of Numerical Weather Prediction for Forecasting Natural Hazards and for Monitoring the Global Environment

A. Hollingsworth, P. Viterbo, and
A.J. Simmons

Research Department

To appear in: A Half Century of Progress in Meteorology:
A Tribute to Richard J. Reed. Ed. R.H Johnson and R A Houze Jr (2002).
pub American Meteorological Society

March 2002

“Since 1985 there have been many developments in the technology of numerical weather prediction. We are at the threshold of a new era in observational capability for weather forecasting and for environmental monitoring. The modelling and data assimilation tools needed to exploit those new observational capabilities have been made ready.”

 ECMWF *circa* 2002

THE NEW FRONTIER

Atmospheric composition

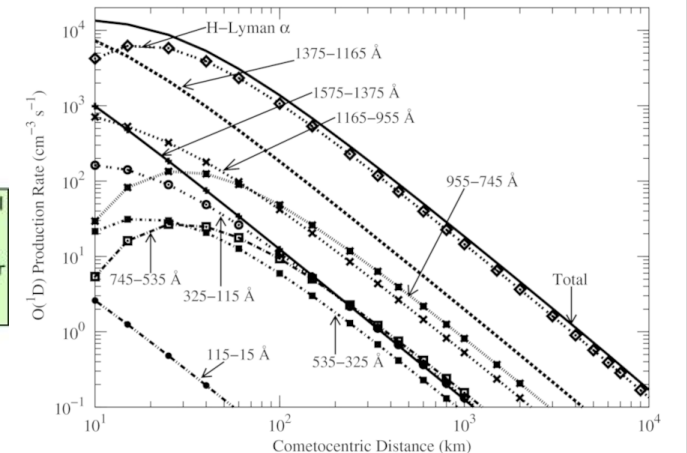
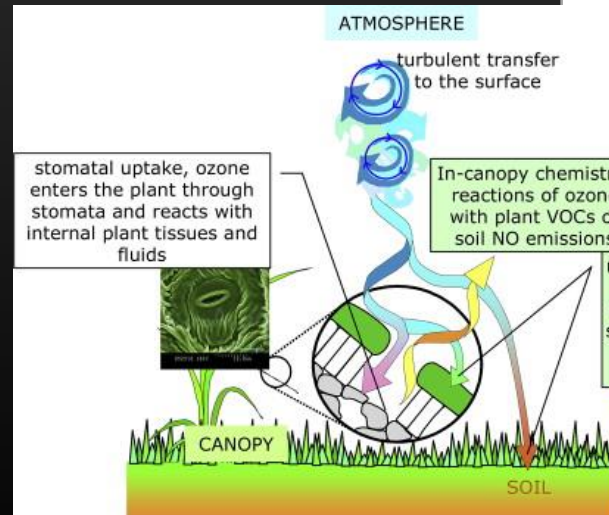
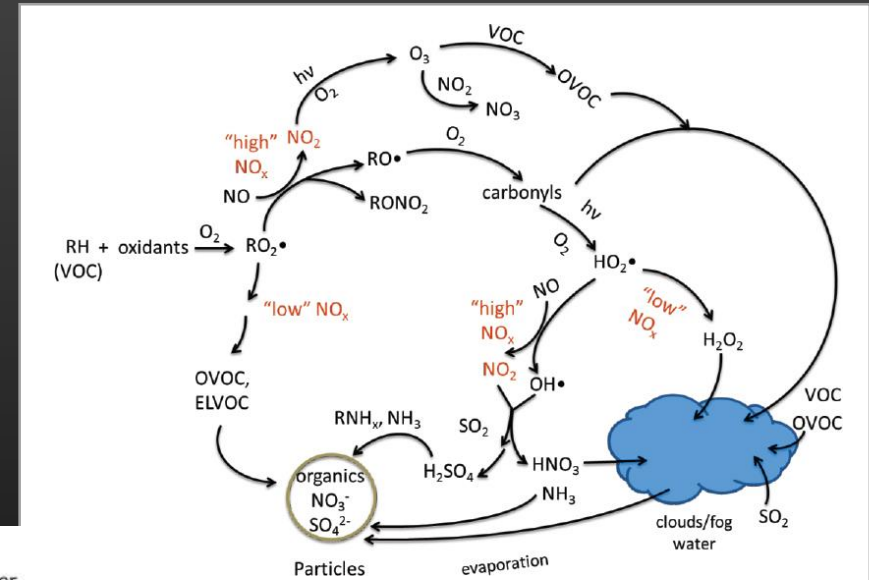


ECMWF needed to make it happen again...
but the initial condition...

$$\frac{\partial O_3}{\partial t} = A_1 + A_2(O_3 - A_3) + A_4(T - A_5) + A_6(\Sigma O_3 - A_7)$$

Atmospheric composition in IFS
circa 2002

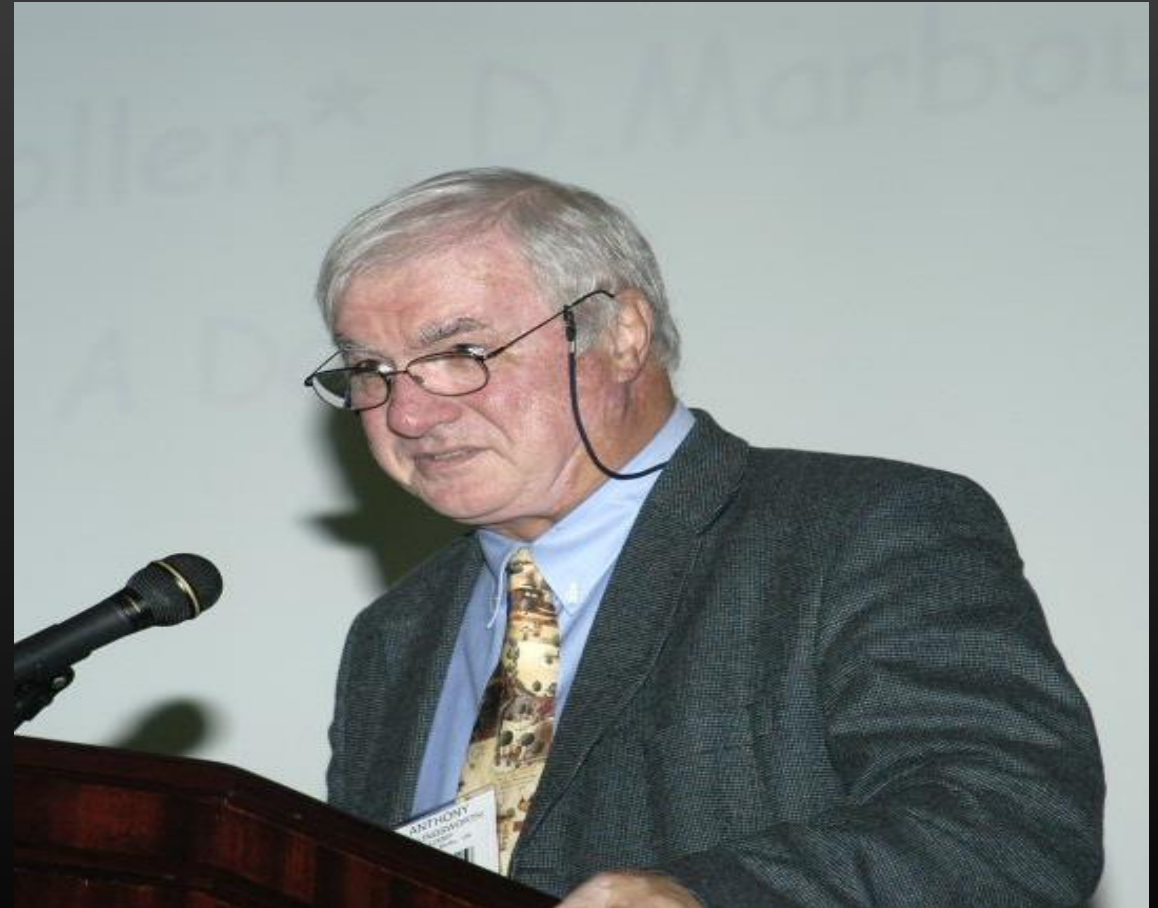
was rather
challenging...



If that was pop music, to make it a success...
...this would have required (at least)



But in matters of atmosphere...
...ECMWF was better off with Tony and Adrian



Ideas were clear, except maybe for the name of this initiative

Global Land Ocean Atmosphere Monitoring from Space through Data Assimilation: GLOAMOS

Workshop to Prepare a Proposal for an Integrated Project in the EU's Framework 6 Programme

ECMWF, May 16-17 2002

Some background material on the GLOAMOS project may be found in Technical Memorandum No. 361: A. Hollingsworth, P. Viterbo, "Numerical weather prediction for forecasting natural hazard environment". (See <http://www.ecmwf.int/publications/library/ecpublications/>)

The proposed sub-projects of GLOAMOS are

- Monitor-GREENHOUSE GASES: Map seasonal variations of Greenhouse Gases such as CO₂, CH₄, N₂O, CO *Refer to*
- Monitor-REACTIVE-GASES: Through assimilation in a C_W weather model, monitor ozone and its precursors, and sulphur
- Monitor-LAND: Model and assimilate information on the L_W
- Monitor-AEROSOL: Model and assimilate global aerosol in
- Monitor-OCEAN-COLOUR: Model and assimilate ocean c_W uptake.
- Monitoring-SYSTEM-INTEGRATION & RETROSPECTIVE: Integrate above projects in a unified pre-operational system and verify observational verification of retrospective analyses for the 2007, and perhaps for the epoch 1947-2007

Contact point: Els Kooij-Connally (e.kooij@ecmwf.int)

Call for Expression of Interest

EOLFP6.2002

EXPRESSION OF INTEREST

Integrated Project

GloMEaSy Global Monitoring of the Earth System

prepared May 31 2002 by

European Centre for Medium-Range Weather Forecasts

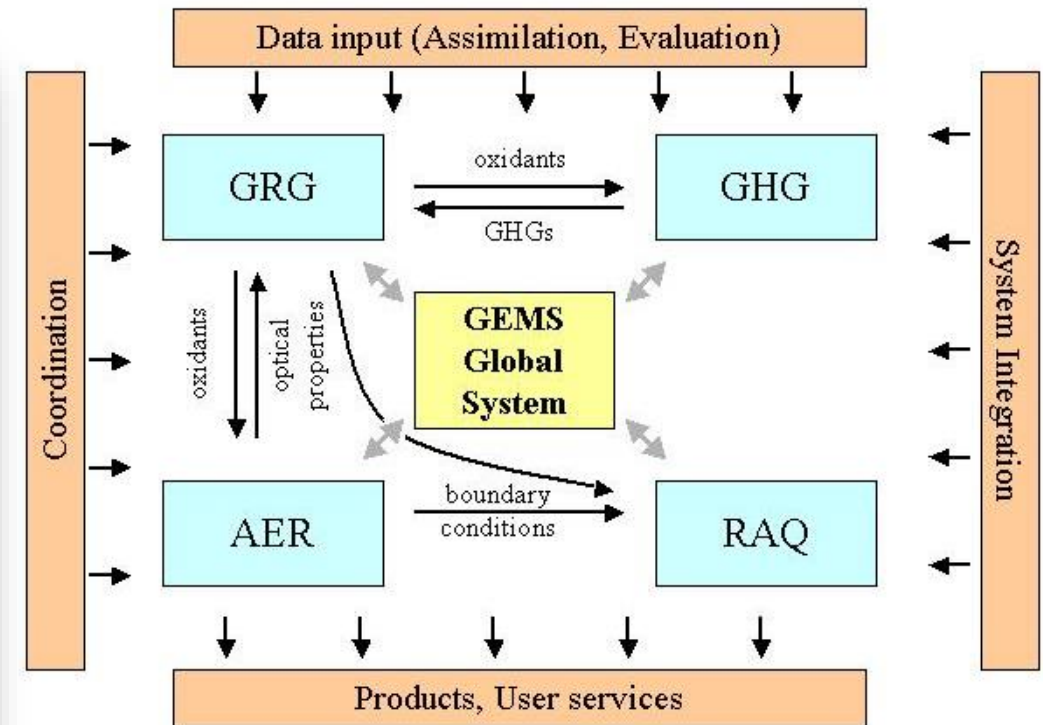
in association with

B	IRM	
D	DWD, MPI-Met DLR, U.Bremen	EUMETSAT MPI-BGC, U.Bremen
DK	DMI	
F	Meteo_France, CEA/LSCCE, Serj.d.Aet.	LOA, IFREMER, Serj.d.Aet.
I	ESA /ESRIN JRC/IES	U.Tuscia,
IRL	NUI_G (Mace Head)	
N	NERSC	NILU
NL	KNMI, E.U.Amst.	SRON,
P	INMG,	U.Lisboa.
SU	FMI	
UK	Met Office, CAS Cantab.	DARC,

This Expression

submitted in response to Call EOLFP6.2002

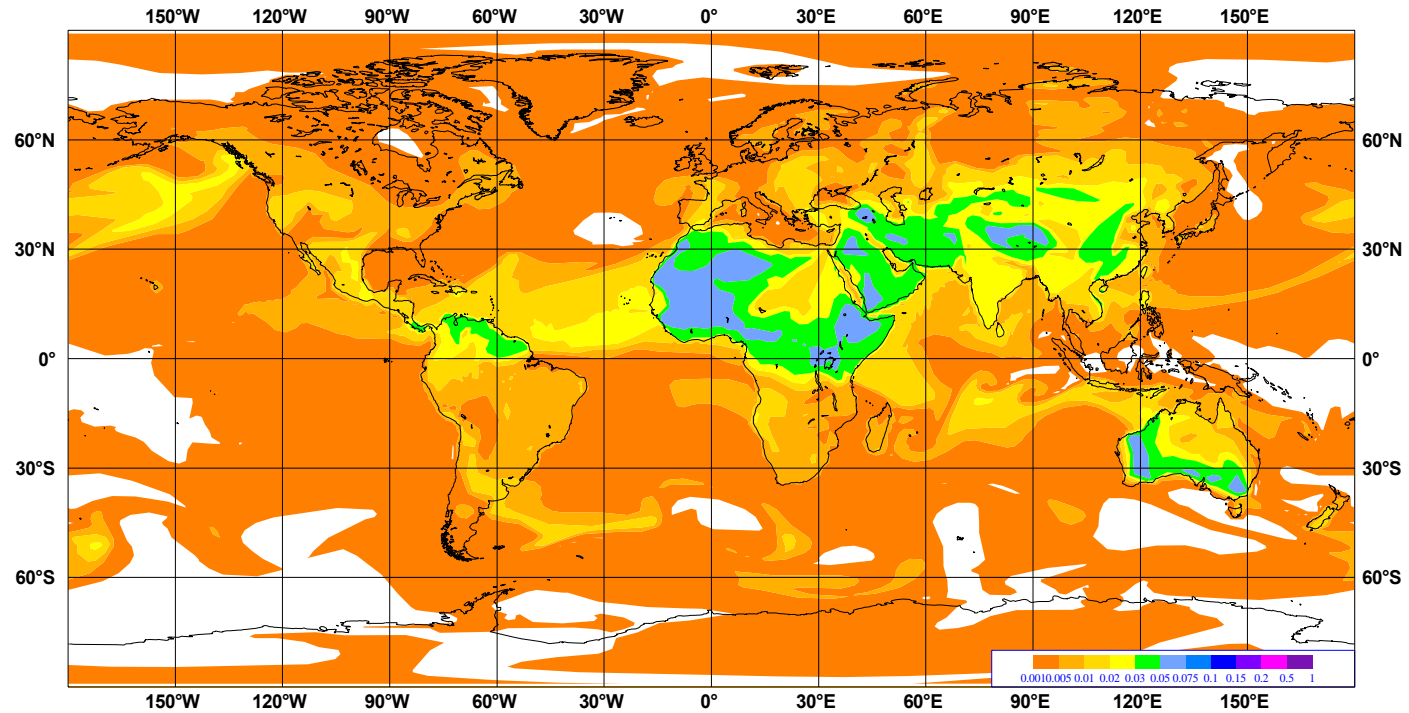
of Interest was



Presentation from A. Hollingsworth to ECMWF Council, June 2005

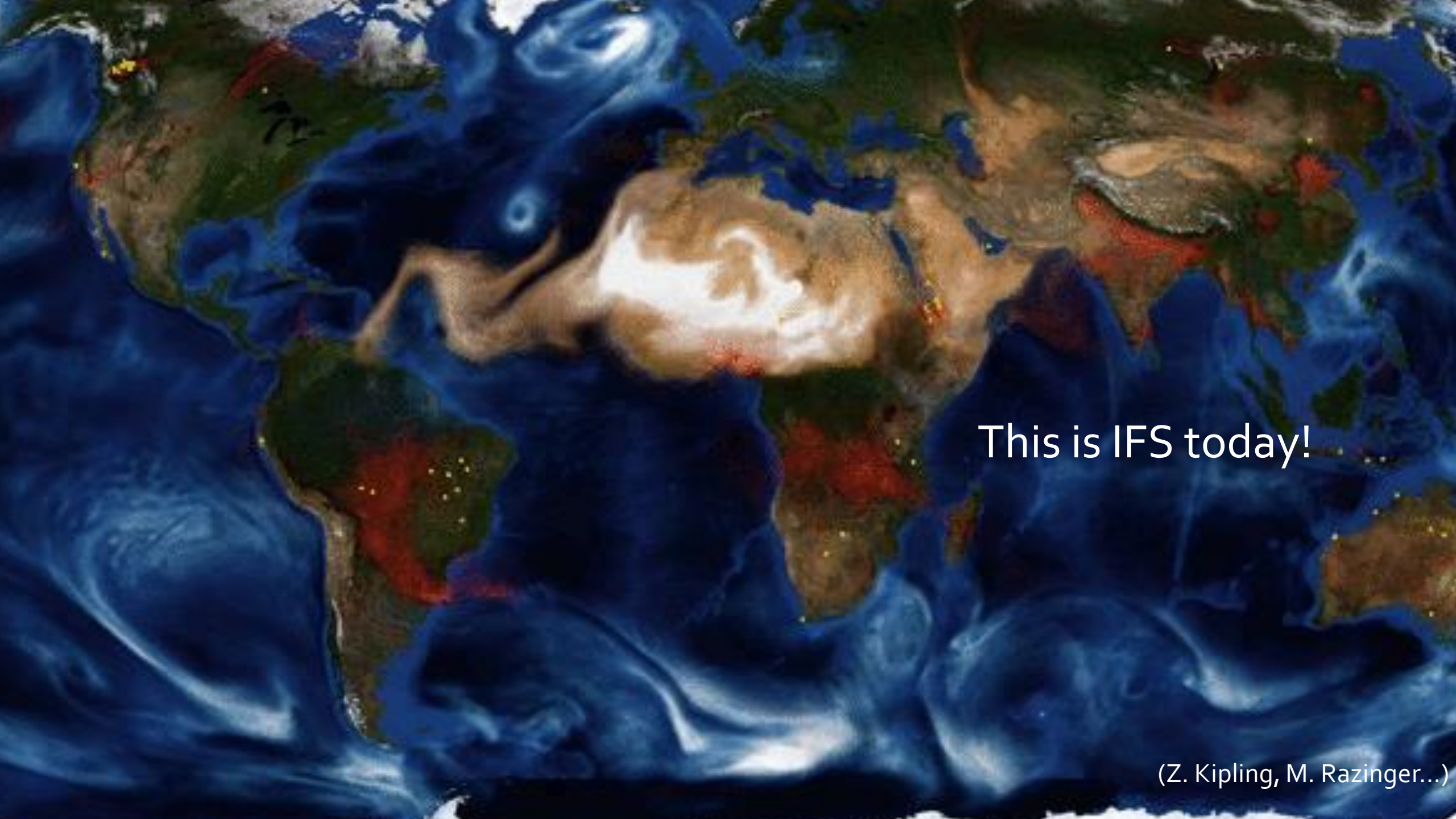
Tony's message was: "a flying start"

Monday 1 January 2001 12UTC ECMWF Forecast t+120 VT: Saturday 6 January 2001 12UTC 1000hPa **



Five –day forecast, showing particulates at 1000hPa, starting from a climatological distribution of Desert Dust (Benedetti, Morcrette, Hortal...).

Really?

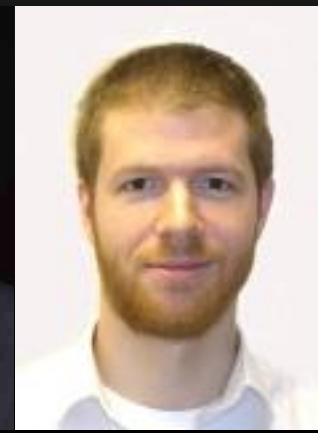


This is IFS today!

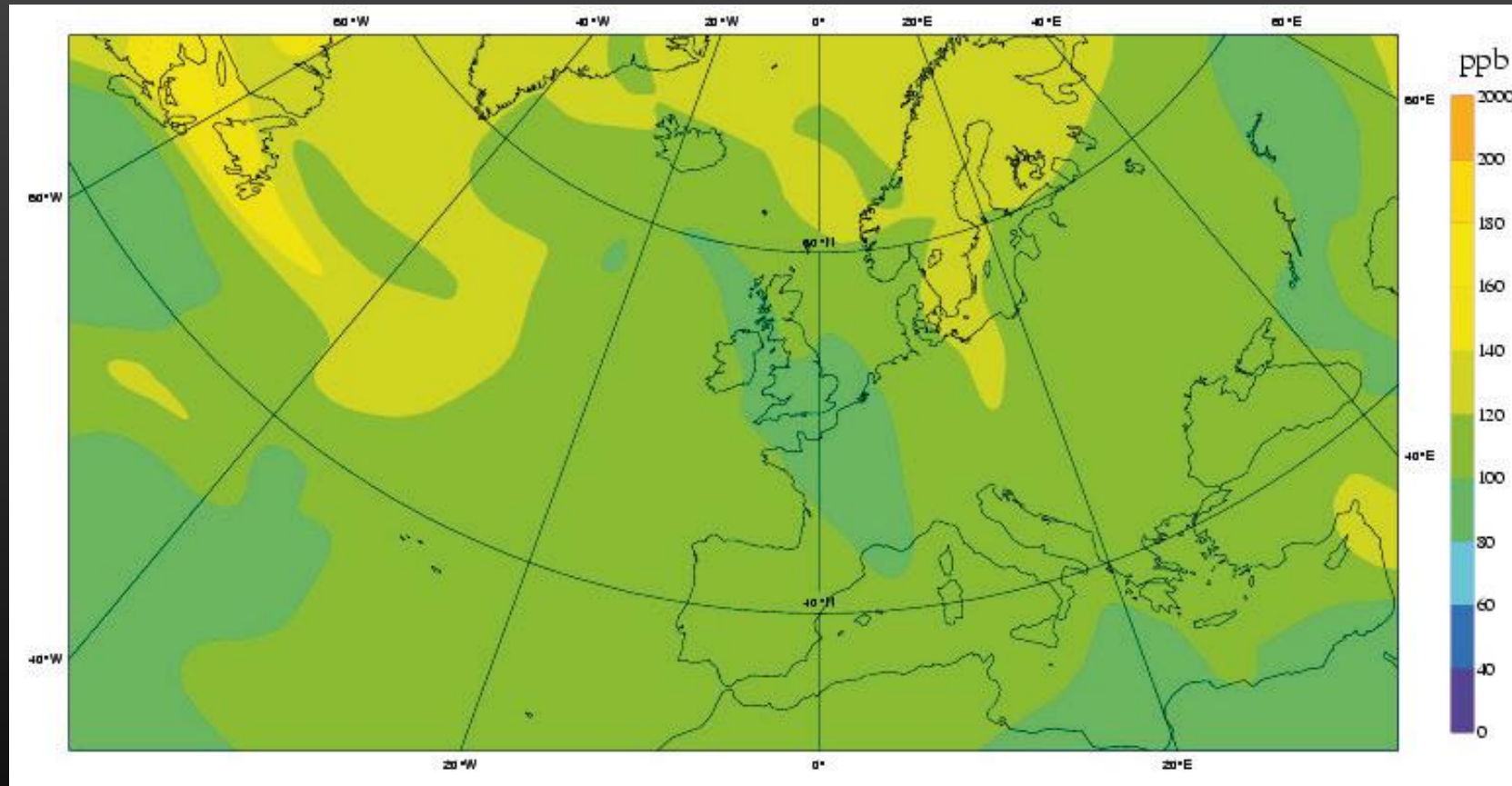
(Z. Kipling, M. Razinger...)

But how did we get there?

GENERATION MAACC



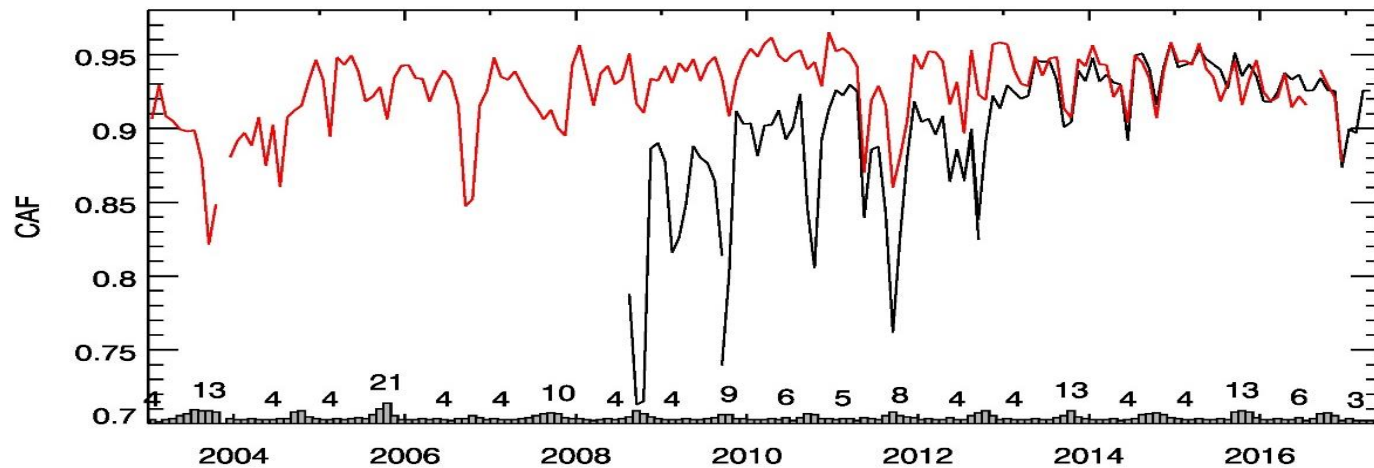
17 May 2007: the first IFS composition forecast



Carbon monoxide forecast obtained with IFS coupled with the MOZART Chemistry and Transport Model using the OASIS₄ coupler

July 2008: the first IFS composition analyses

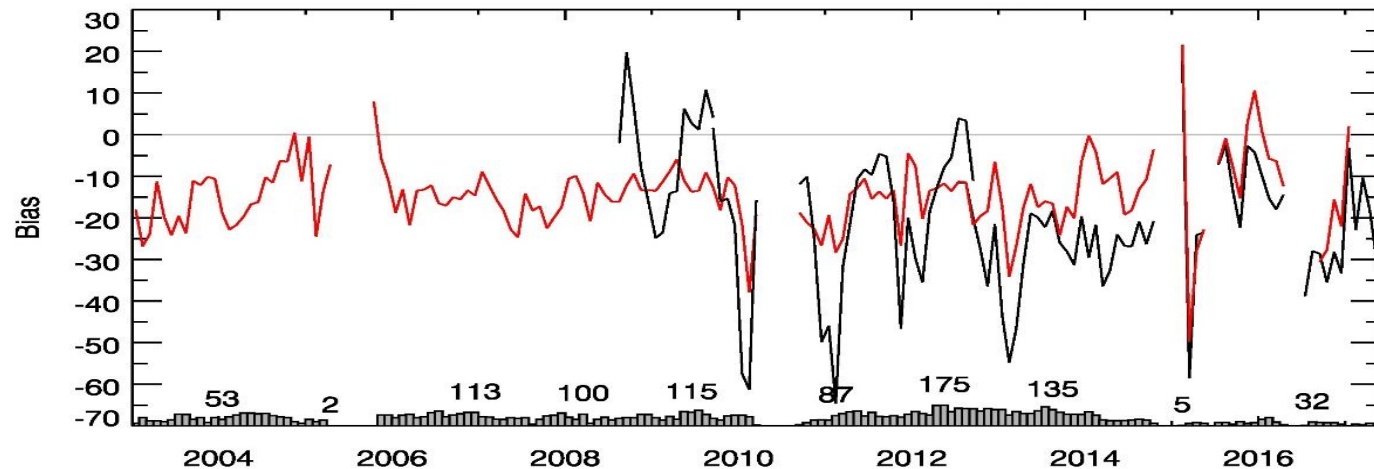
good
↑
bad



NRT analyses

CAMS interim reanalysis

Ozone profile against sondes at Neumayer (Antarctica)

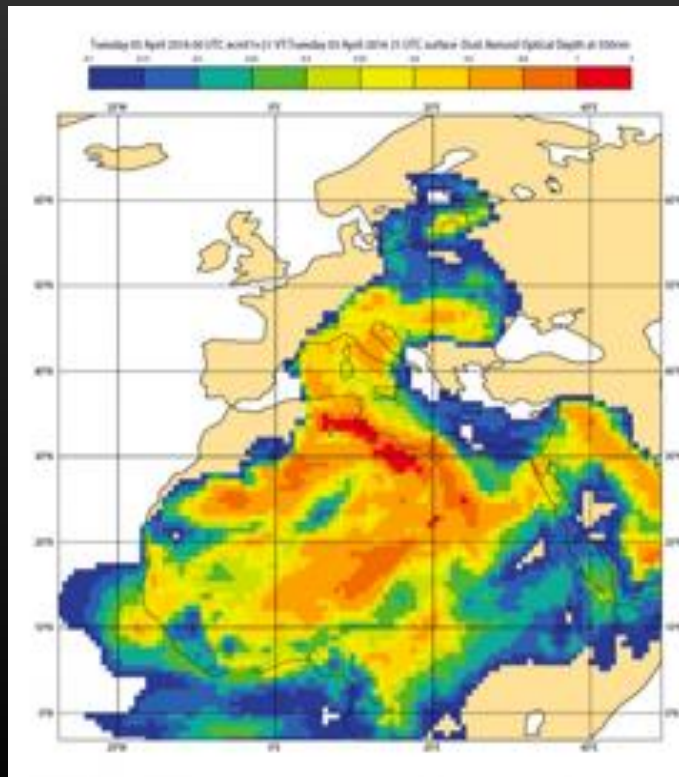


CO in the 1000-750 hPa layer at Frankfurt against IAGOS aircraft data

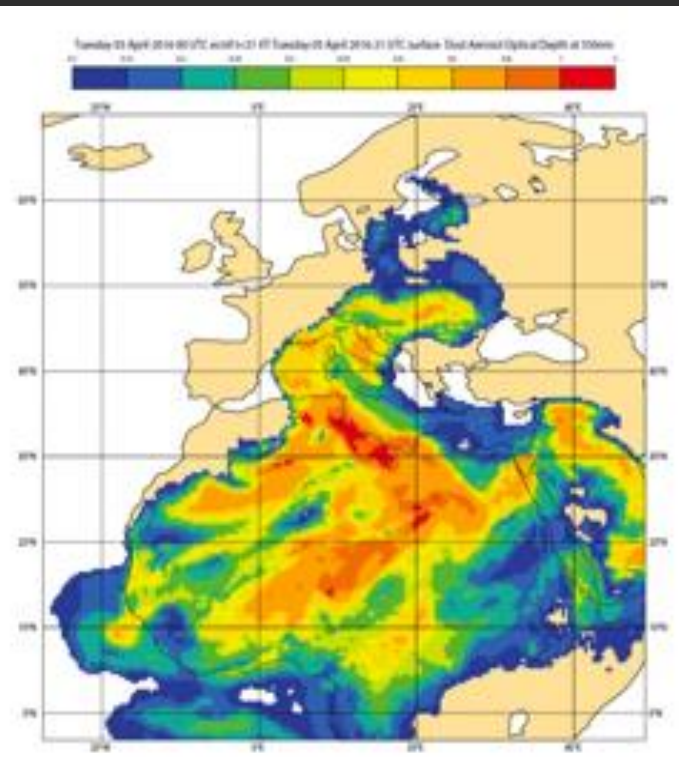
January 2014: the coupled system retires, IFS has online (complex) chemistry

June 2016: resolution moves to 40km, 2 daily analyses and forecasts

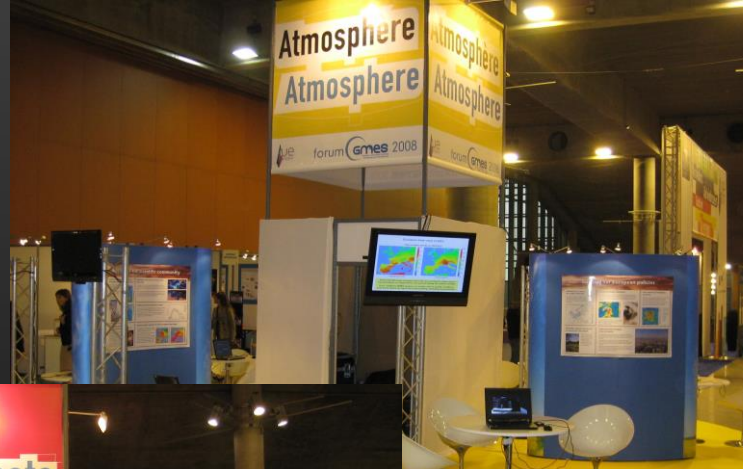
old



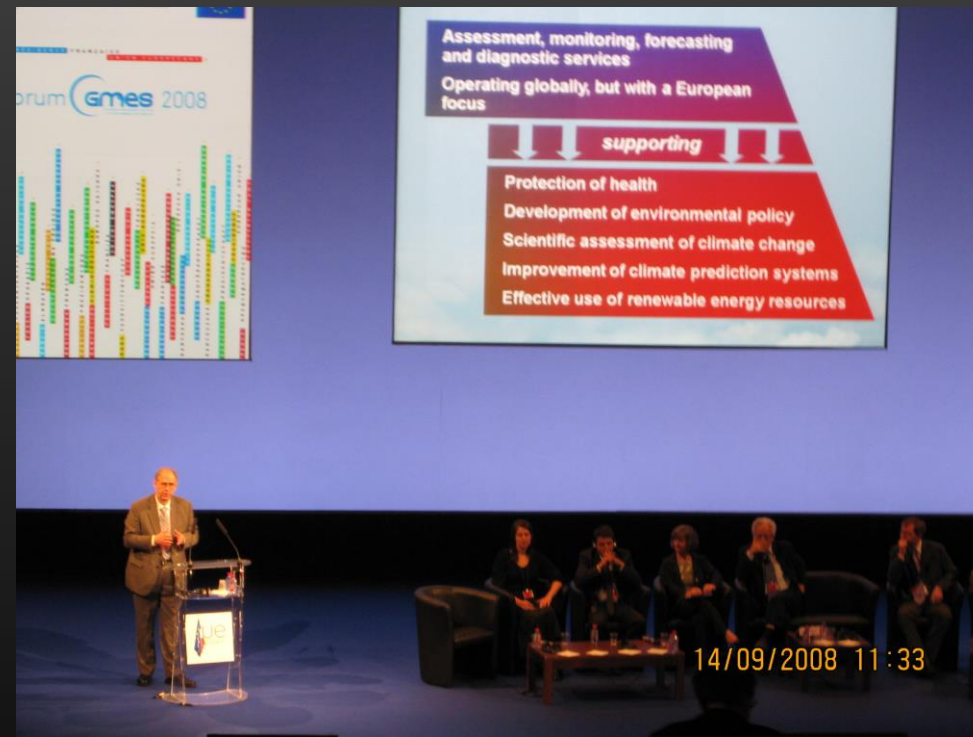
new



September 2008: the Lille forum



Launching GMES into orbit...



But, obviously, something was wrong...



So that was "on the road again..."



And the road was still long...

From: **Adrian Simmons** <adrian.simmons@ecmwf.int>

Date: 11 December 2009 at 21:32

Subject: Report of GAS IG meetin, 11 December 2009

Dear colleagues,

I attended today a meeting of the GAS IG in Brussels.

Main item was the response to the latest disastrous plan of the EC (Unit H₃, not the GMES bureau) to fund a follow-on to MACC through an inadequate CSA for an operational bit (around 3M a year for this) plus lots of (uncoordinated) small (2M max) RTD projects (ocean fighting atmosphere, ocean fighting ocean, atmosphere fighting atmosphere, most points win, nonsense).

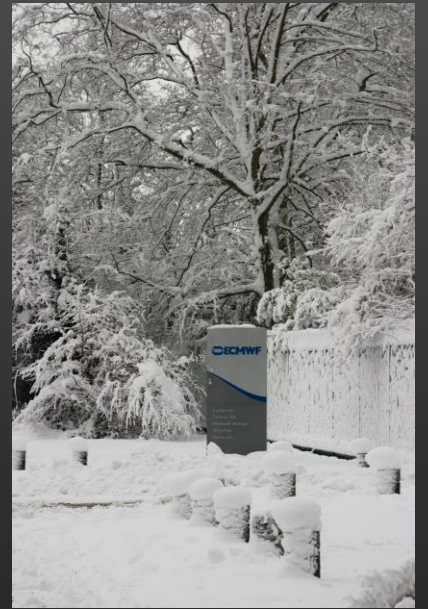
The IG were unanimous in their condemnation of the proposal, and were supported by the bureau, who drafted a page of text that will go to the PC. Text includes message that there is a risk that ECMWF withdraws if the proposal goes ahead, that GMES could be left with no atmosphere service and thus no justification for continuing with Sentinel 4 and 5.

[...]

And then, the elements broke loose...

"Earlier this morning I spoke on the phone with the Director of ECMWF (I am stuck at home due to snow) to confirm that we will go ahead with the meeting despite adverse wintry conditions. We have decided to, though will warn participants that they should be prepared for a winter walk of up to one hour from down-town hotels in the event of further snow. Currently buses are running reasonably, but with taxis hard to find. We also have to warn participants that our kitchen is experiencing problems with food deliveries, so provision of an adequate lunch may be problematic."

6 January 2010



(R. Engelen)



But nothing could stop the MACC generation to respond to Adrian's call...

And there were even more dreadful obstacles on the way!

WP Nr.	Deliv. Title	View	Delivery Month	Delivery Deadline Date	Receipt Date	Clock	Days Left	Status	Next Action	Acceptance/Rejection date	Comments	Reporting Period
11	12-hourly NRT_satellite	1	1	30/11/2011	08/05/2013	45	0	Received			Delivered from Month 1 onwards	
11	12-hourly overview of av	1	1	30/11/2011	08/05/2013	45	0	Received			Delivered from Month 1 onwards	
11	Satellite observations fo	1	1	30/11/2011	08/05/2013	45	0	Received			Delivered from Month 1 onwards	
11	Satellite observations fo	1	1	30/11/2011	08/05/2013	45	0	Received			Delivered from Month 1 onwards	
11	Satellite observations fo	1	26	31/12/2013	01/05/2014	45	0	Received				
12	3 hourly NRT in situ obs	1	1	30/11/2011	08/05/2013	45	0	Received			Delivered from Month 1 onwards	
12	3 hourly overview of av	1	1	30/11/2011	08/05/2013	45	0	Received			Delivered from Month 1 onwards	
12	Compilation of in situ ob	1	6	30/04/2012	08/05/2013	45	0	Received			Delivered from Month 6 onwards	
12	Report on identified new	1	9	31/07/2012	21/09/2014	45	0	Received				
12	Report on MACC-II reco	1	12	31/10/2012	31/07/2014	45	0	Received				
12	Report on MACC-II reco	1	24	31/10/2013	31/07/2014	45	0	Received				
12	2nd Report on MACC-II	1	30	30/04/2014	31/07/2014	45	0	Received				
13	NRT IAGOS observations	1	1	30/11/2011	08/05/2013	45	0	Received			Delivered from Month 1 onwards	
13	Historical MOZAIIC and I	1	6	30/04/2012	08/05/2013	45	0	Received				
13	Report on identified add	1	9	31/07/2012	31/05/2013	45	0	Received				
14	Report on identified me	1	9	31/07/2012	21/09/2014	45	0	Received				
15	Report on the evaluation	1	22	31/08/2013	30/07/2014	45	0	Received				
16	Overview reports of the	1	9	31/07/2012	21/09/2014	43	0	Received			Additional reports delivered at months 18 and 27	
16	Overview reports with su	1	9	31/07/2012	31/05/2013	45	0	Received			Additional reports delivered at Months 18 and 27	
16	Reports with feedback to	1	11	30/09/2012	12/08/2014	45	0	Received			Additional reports delivered at Months 21 and 31	
16	Reports with recommend	1	12	31/10/2012	31/07/2014	45	0	Received			Additional reports delivered at Months 24 and 32	
21	Emissions database and	1	12	31/10/2012	28/01/2013	45	0	Received			An update will be delivered in Month 33	
22	Report on update of ant	1	12	31/10/2012	28/01/2013	45	0	Received			An update will be delivered in Month 33	
22	Report on the evaluation	1	24	31/10/2013	01/08/2014	43	0	Received				
23	Report on the evaluation	1	30	30/04/2014	30/07/2014	45	0	Received				

How many clicks to upload a deliverable in this new beta-version interface?

But we got by with a little help from our friends



And Adrian has a secret weapon...



**KEEP
CALM
AND
USE
BRITISH
HUMOUR**

English 'beat French to frogs legs' claim after Wiltshire dig finds

🕒 15 October 2013 | [Wiltshire](#)



The dig has uncovered the kinds of food being eaten 8,000 years ago

A major archaeological dig in Wiltshire has unearthed evidence of frogs legs being eaten in Britain, 8,000 years before France, it has been claimed.

From: "Vincent-Henri Peuch" <vincent-henri.peuch@ecmwf.int >
To: "Adrian Simmons" <adrian.simmons@ecmwf.int >, "Richard Engelen" <richard.engelen@ecmwf.int >
Sent: Thursday, 17 October, 2013 9:50:32 AM
Subject: Nothing is certain anymore

Hi,

Don't worry, this is not about Copernicus! But still shocking news ;)

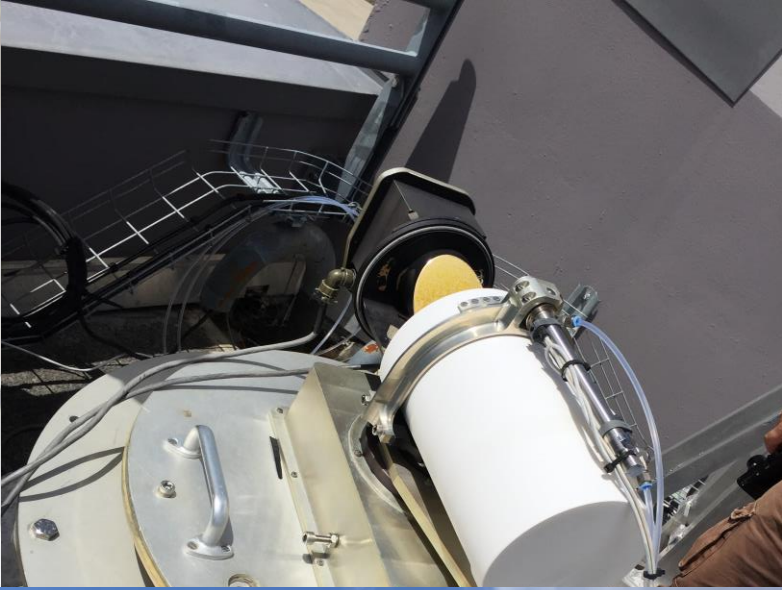
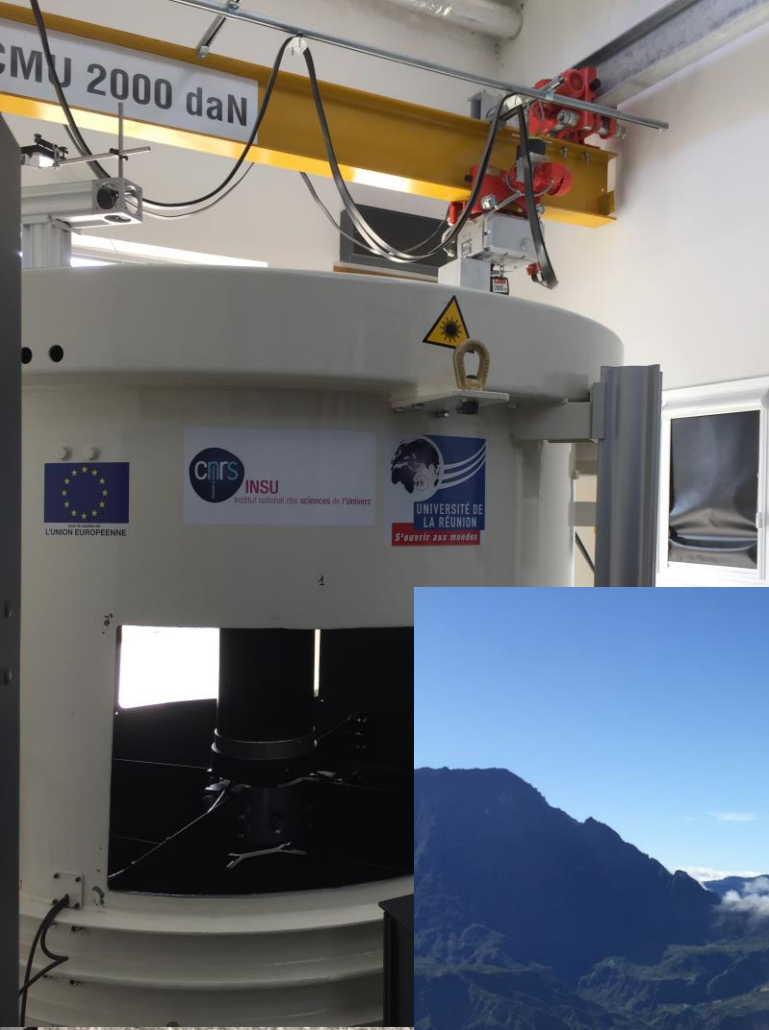
<http://www.bbc.co.uk/news/uk-england-wiltshire-24522240>

Vincent-Henri

From: "Adrian Simmons" <adrian.simmons@ecmwf.int>
Subject: Re: Nothing is certain anymore
Date: 17 October 2013 at 11:04:42 CEST
To: "Vincent-Henri Peuch" <vincent-henri.peuch@ecmwf.int>
Cc: "Richard Engelen" <richard.engelen@ecmwf.int>

It was probably visiting French people who were eating the frogs' legs.

Adrian



Thanks Adrian!

The MACC Generation