3.3 Analysis Coordinator

1. Introduction

In this report we outline the activities of the Analysis Coordinator during 2011. The main activities were clarifying the distribution of rapid EOP products; examining the distribution and formats of the IERS EOP products; initial planning for the IERS Retreat and the IERS action items from the 3rd GGOS Unified Analysis workshop.

2. Rapid product delivery clarification

A review of the product delivery by the IERS revealed that there was confusion about the official IERS rapid Earth Orientation Parameters (EOP) product. This product delivered with 24-hour latency and including predicted values is generated by the IERS Rapid Service/Prediction Centre hosted at the US Naval Observatory (USNO). This product is the official IERS product however the IERS center responsible for the long-term IERS series was also delivering a rapid and predicted product as part of its “definitive” C04 product. The two rapid products, while similar in value, are not the same and this difference could cause confusion among the users of the IERS services. The IERS Directing Board directed the IERS Earth Orientation Center, hosted at the Paris Observatory, to remove their rapid product from the long-term series distribution. The Paris Observatory rapid product could still be made available through the Paris Observatory itself rather than as an official IERS product. With this change bulletin A, the rapid product, is available solely through the rapid product center, hosted at the US Naval Observatory.

The following announcement was sent to users of IERS data on November 3, 2011:

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IERS Message No. 198                                  November 03, 2011
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Note to IERS C04 and Bulletin A users

According to the IERS Directing Board resolution (DB52), and starting on
1 December 2011, the EOP C04 series will be delivered with a 30-day
latency. In other words, only final definitive values will be included
in it.

Users needing a long-term continuous series extending up to a recent
date (including rapid solution over the most recent 30 days) will have
two solutions:

1) Getting the C04 solution extending until the date 30 days back
  and available at
  ftp://hpiers.obspm.fr/iers/eop/eopc04/eopc04_IAU2000.YY
  where YY is current two digit year
  and concatenate it with the Rapid solution issued from the Rapid
  Service/Prediction Center available at:
  ftp://maia.usno.navy.mil/ser7/finals2000A.daily
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   Due to differences in the delivery times of the two products, users
   should exercise caution in blending the files to ensure that there is
   continuity between C04 and Bulletin A.

2) Getting the new OPA EOP solution consisting of a continuous series
   derived from the concatenation of the C04 series and the OPA rapid
   solution available at:
   ftp://hpiers.obspm.fr/iers/series/opa/eopc04_IAU2000

3) The OPA files are now available at this location for users wishing to
   test the new file locations.

If users expect problems with this new arrangement, please contact
central_bureau@iers.org with their concerns. Subject line should include
"C04 transition".

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As noted in the announcement, users still could continue to obtain the Paris Observatory rapid product if they wished directly from the Paris Observatory FTP site.

3. IERS product format unification

An early activity of the Analysis Coordinator was to look at the IERS product distribution. Of concern here was the variety of formats and information content in the products. Initial thoughts on these topics are given below and ultimately these will be addressed at the IERS Retreat. Figure 1 shows the IERS EOP products page.

The layout of the IERS product page is very nice for users browsing the page, but when links are revealed the pattern of the links is not clear (and thus difficult to automate).

For example to download C04 for 2011 from the IERS web site a user would need to use the command wget from a terminal in the form:

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wget <http://data.iers.org/products/211/14461/orig/
eopc04_08_IAU2000.11>
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Also the file name used at the product centers differ from those at iers.org and therefor the correspondence of the files is not obvious. Also in the link above, the values of 211 and 14461 are not clear and are different for each product and change between products (e.g. Bulletin B each month). One question to raise is where users get their products? Do they download them directly from product centers or from the IERS http or ftp sites? Where do we want users to download products? The ftp servers at IERS.org (which is an easily overlooked link) has many layers and products with file names with bulletin “numbers” which are need to be converted to dates.

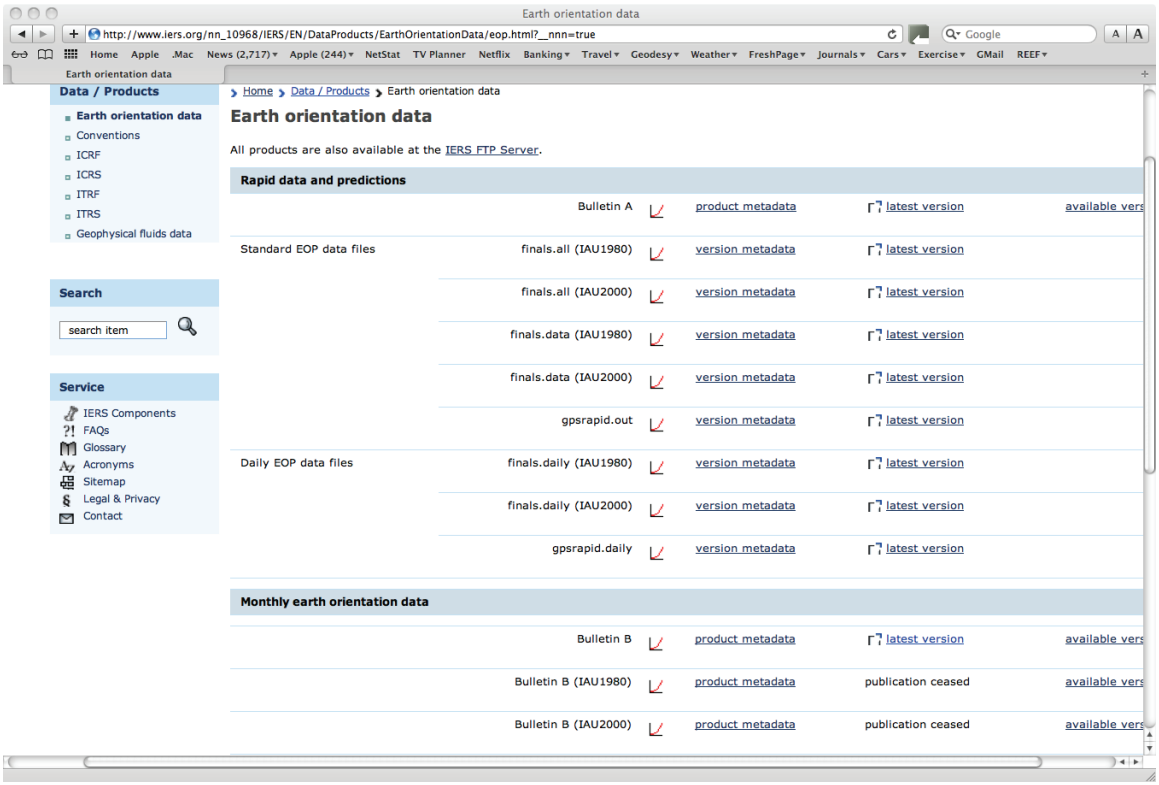

Fig. 1: IERS products page, shortcut URL <http://www.iers.org/EOP>

Also to be considered other uses of the products. There are three main EOP bulletins/series:

Bulletin A: Rapid service, available in two forms finals2000A.data (updated weekly) and finals2000A.daily (updated daily).

Bulletin B: Monthly updates.

C04: Monthly updates (recently changed (Dec 1, 2011) to have only definitive values).

Who is using which products? IGS analysis centers use Bulletin A files (downloaded from USNO). There are small differences between the EOP estimates in USNO files labeled “data” and “daily” for the most recent observed values. There are small differences between C04 and Bulletin B and in recent years, the use of Bulletin B as opposed to C04 has not been clear. C04 is meant to be the definitive IERS series whose values do not change accept from major revisions of the terrestrial reference system. Is Bulletin B still useful or should C04 be used in its place? It is not clear why all years of C04 seem to be updated regularly if this is the definitive series that should not change except for the addition of new values.

Possibly most problematic with the current products is that each one of the EOP series has different formats and different information content. In some cases units have different between the different bulletins. The IERS needs to develop a common format for all of its EOP products. This format might be generated from the current series input by each of the product centers or the product centers themselves might change that formats. For users of the IERS products, the existing formats should be retained for backwards compatibility.

Some of the other differences in the products have to do with whether headers are included which describe the columns in the format or whether the user needs to consult the metadata information at the IERS website in order to decode the data format. Current IERS EOP products are not uniform in format, units or locations. A concise summary of how each product is generated, what its nominal purpose is (e.g., Bulletin B versus C04 for post-processing) and measures of accuracies of the input contributions. These summaries can be found searching around ftp areas etc but should be made more prominent. There should be clear indication of the date of generation of the product when this is not clear in file name. Generation of a set of products in the same (machine friendly) format would allow easy comparison of the products and the generation of statistics for each product. Most likely existing products would not be eliminated (for backwards compatibility with existing user software) but new formats would be made available.

Some thought needs to be given to the file naming conventions. For example, finals.2000A.daily is easily generated but age of product is not clear. Bulletin number NNN indicates an age but it is not clear how to generate date from the number.

These topics and implementation plans will be discussed at the IERS Retreat.

4. Initial planning for IERS Retreat

Initial planning for the IERS Retreat was started with the basic questions to be addressed. The general concept of the retreat is to ensure that the IERS products continue to be timely, high quality, and meet the needs of the IERS users. The initial discussions of the retreat focused on questions such as: Who are the current and potential future users of IERS products? Which products are required to meet the demands of these users? How to organize the IERS to produce them?

Other possible topics for the retreat are the changes and updates to the distribution of IERS products (data format and data access). Is there a need for new products? For example, should IERS start to develop a product giving the offset between the center of figure and the center of mass of the Earth system?

The IERS generates products on a regular basis. As these products have become routine, we need to consider approaches for handling discontinuities in the coordinates of sites used to determine EOP values. Specifically within the last few years there have been large earthquakes that generate significant co-seismic offsets at a large fraction of the IERS reference sites. In addition to the co-seismic offsets, there are also post seismic deformations that continue to affect the reference frame for potentially many years after the earthquakes. How the IERS should accommodate rapid updates to the reference frame used for the EOP values needs to be addressed.

Other topics to be considered include: How to assure the best results of the IERS products? And how well is the organization working in its structure and in individual parts?

The retreat plans initially targeted early 2012 as the likely time to hold the retreat. However, based on trying to find a time for the retreat and the time needed for preparation before the retreat, it is more likely that the retreat will be held in 2013.

5. Unified Analysis Workshop Action Items

The 3rd Global Geodetic Observing System (GGOS) Unified Analysis Workshop (UAW) was held September 16–17, 2011 at ETH Zurich, Switzerland (see also the report in Section 4 below). The presentations from the workshop are on-line at <http://www.iers.org/UAW2011>. Presentations made at the workshop are available under the *programme* link. There were a number of action items for the IERS that are being worked on (Table 1).

Progress has been made on all these action items with some of them to be more fully addressed at the IERS Retreat. Specifically, the IERS Working Group on Site Coordinate Time Series Format, chaired by Laurent Soudarin, has been formed and is active; the study of loading effects at the observation level has been performed and the results collected by the Global Geophysical Fluids Center and the analysis of the center of mass products will be addressed at the IERS Retreat.

Thomas Herring

Table 1: Action Items from the 3rd Global Geodetic Observing System Unified Analysis Workshop

AI	Description	Responsible	Deadline
6	Establish an IERS WG on site coordinate time series: Common format/interfaces for coordinate time series of all techniques. Common tool for display? What type of coordinate time series are required (geocentric, de-trended, reference frame, …) Members: - Chair: Laurent Soudarin - One representative from each technique combination center - One representation from ITRS CCs - GGOS portal manager - Representatives from geophysics/geodynamics, oceanography, …	Chair: Laurent Soudarin; IERS sets up the working group.	02-DEC-11 WG group formed and active
7c	Atmospheric loading corrections on the observation level: Decision not yet taken. Check which IGS ACs can apply atmospheric loading. IGS ACs should get prepared to apply atmospheric loading (recommendation) All services to process the years 2006–2010 with and without atmospheric loading. 1–3 AC solutions per Service would be sufficient for this test. Services identify the ACs. The GGFC model should be used. Tonie van Dam will make this data available for the various formats. Assess the impact on ITRF.	IGS Chair or IGS AC 1-3 ACs from each Service: IVS, ILRS, IDS,IGS GGFC ITRS CC	05-OCT-11 29-FEB-12 30-NOV-11 31-MAR-12
11b	Should there be again a Sub-bureau for geocenter motion in GGFC? Yes. A plan will be developed by Tonie van Dam	GGFC, IERS	15-APR-12