

Minutes of AOPC pressure working group meeting, held as part of the MARCDAT II workshop in Exeter, UK.

Meeting held at the Met Office between 9:00 – 5:00 pm on 21st October, 2005

1 Attendees

Rob Allan – Met Office Hadley Centre for Climate Prediction and Research (co-convenor)
Tara Ansell – Met Office Hadley Centre for Climate Prediction and Research
Theo Brandsma - KNMI
Manola Brunet - Climate Change Research Group, University Rovira i Virgili
Michele Brunetti – ISAC, CNR
Gil Compo – NOAA Earth System Research Lab (co-convenor)
Joe Elms – NOAA NCDC
Malcolm Haylock – CRU, UEA
Julie Jones – GKSS Research Centre
Phil Jones - CRU, UEA
Masao Kanamitsu - Scripps Institute of Oceanography
Alexey Kaplan – Lamont-Doherty Earth Observatory of Columbia University
Maurizio Maugeri – Istituto di Fisica Generale Applicata, Milan University
Shawn Smith – Center for Ocean-Atmosphere Prediction Studies, Florida State University
Ag Stephens – British Atmospheric Data Centre (and also Met Office)
Val Swail - Environment Canada
Bridget Thomas – Environment Canada
Dennis Wheeler – University of Sunderland
Clive Wilkinson – NOAA (currently at CRU, UEA)
Kate Willett - CRU, UEA and also Met Office Hadley Centre for Climate Prediction and Research
Scott Woodruff – NOAA Earth System Research Lab
Philip Woodworth – Proudman Oceanographic Laboratory
Masumi Zaiki - Kobe University (currently at CRU, UEA)
Xukai Zou - National Climate Center, China Meteorological Administration (currently at Met Office Hadley Centre for Climate Prediction and Research)

Minutes taken by Tara Ansell

2 Executive summary

Rob Allan opened the meeting by thanking all those for attending. Discussion then centred around nine main themes:

1. The GCOS AOPC/OOPC Surface pressure working group WWW site (<http://www.cdc.noaa.gov/Pressure/>)
2. International Surface pressure data bank
3. Data archaeology, digitisation
4. Gridded historical MSLP products
5. Historical Reanalysis
6. Extension and reconstruction of long MSLP series and indices
7. Discussion of inclusion of winds in our remit
8. Some recent analyses using MSLP data
9. Work plan

1. The GCOS AOPC/OOPC Surface pressure working group WWW site

Gil Compo provided a tour of the new web site, requesting feedback from all present. The issues of whether to provide software on the site was discussed and it was agreed that providing some sample code (e.g. snippet of Fortran) would help prevent misunderstandings. Phil Jones noted that the start date for the Azores series was wrong (should be 1865).

Other issues included whether the site is OPeNDAP (Open-source Project for a Network Data Access Protocol)/ DODS (Distributed Oceanographic Data System) compatible (it is). Shawn Smith suggested that to get around the issue of not being able to readily click back to the main page, we could have a separate pop up of the page.

It was also decided that it would be important to pursue a GCOS proposal to maintain the web site.

Daily fields at this stage have not yet been included on the website.

2. International Surface pressure data bank (ISPD)

Gil Compo introduced the concept of ISPD, whose main aim is to include every single pressure observation for as far back in time as possible in the data bank (from sub-daily to monthly and from land and ocean). The goal is traceability. Two main issues were discussed: the data format and regional co-ordinators to help further ISPD.

2.1 ISPD Format

The ISPD format was described (see supplementary information) and comments were sought. Currently, the ISPD format has 50-fields and is in ASCII format, this may change to netCDF/HDF, given flexibility issues. For example there is an assimilation section which enables fields to be filled in with analysis errors etc, however we would need to specify ahead of time how many versions we wish to accommodate.

Ag Stephens suggested that for our archive format, we should use what is considered to be most common or standard. We can then provide an interface to convert to ASCII for the user. HDF5 would be an appropriate archive format, which is more flexible than ASCII, enabling us to potentially better serve our clients. The group agreed to use HDF5.

We then considered whether it was appropriate to ask people to convert to this format when submitting data or whether the conversion would be done by just a number of centres. Shawn Smith said that in their experience at FSU, less data will be sent in if the emphasis is placed on the data providers. Scott Woodruff added that it is difficult to get people to send in data with the exact format and therefore this has the potential of introducing errors. The group decided that it may be better to have a number of conversion centres (<5) with an emphasis on being international, not just US based. It was also agreed that it would be important to get independent funding to support these centres. The costs for conversion could be as high as 20-35% of the total budget.

Dennis Wheeler highlighted the need to include comments fields in the ISPD data format on how conversions were made, especially with regard to old units of pressure.

Gil Compo asked for feedback on the ISPD format. A sub working group was formed (Gil Compo, Shawn Smith, Tara Ansell and Dennis Wheeler)¹ and they agreed to comment on the revised version and send comments back asap. Gil Compo would like the format to be agreed in a weeks time (early November, 2005).

2.2 Regional co-ordinators

The concept of regional co-ordinators was discussed. Rob Allan asked for those listed (see supplementary information) to consider their role and confirm involvement. Phil Jones suggested that Gareth Marshall should be included from BAS.

Rob Allan also raised the possibility for better co-ordination with Meteorological Services. One approach would be to open the data archive to Met services around the world and encourage reciprocal data exchange to order to fill in gaps.

The Globe program was mentioned as another potential source of data and involvement from a wider audience, in this case students. See:
<http://www.globe.gov/fsl/welcome/welcomeobject.pl>

3. Data archaeology, digitisation

There were 7 presentations given in this section, 5 of which are available from the AOPC web page. General comments are described below; a list of all presentations and Q&A (not noted here in the general comments) are provided in section 5.

General comments:

Gil Compo raised the issue of the missing sources that went into creating the '1899' hand drawn North Hemisphere synoptic charts: There is a table of sources used to create this map (handed out) and all these sources were originally in the NOAA library, but now they have been lost. Gil Compo/ Rob Allan asked for regional co-ordinators to help find these records.

Maurizio Maugeri said a complete inventory is needed of Jesuit records (see Manola Brunet's presentation). Rob Allan suggested that the work already undertaken by Agustín Udías may be a good start (see references).

Alexey Kaplan is happy to pass on his Optical Character Recognition (OCR) software to those interested. He reported good success using printed monthly data from Russian volumes (see presentation).

Environment Canada has a number of digitization priorities, however they are open to proposals for the digitisation of any specific stations, periods or regions of interest – please let Val Swail know.

¹ The subgroup had planned to meet up during the meeting, but there was not enough time.

General recommendation: if we are going to digitise, then please digitize all variables

4. Gridded historical MSLP products

There were two presentations on gridded MSLP products by Tara Ansell and Alexey Kaplan, both of which are available on the AOPC web site. The main issues included the use of wind data in improving the analysis (Kaplan) and the Hadley Centre's plans to develop a sub-daily MSLP dataset over the Northern Hemisphere (Ansell).

Both were seen as important developments and work to pursue by the group.

5. Historical Reanalysis

Two presentations were given on this issue: one by Masao Kanamitsu on the role of pressure and SST observations in reanalysis and the other by Gil Compo on the feasibility of an historical reanalysis without soundings (both presentations are available). Gil Compo stressed the importance of getting all available sub-daily pressure observations. Even if it is not included in time for the reanalysis, it will still be important for validation.

6. Extension and reconstruction of long MSLP series and indices

There were 4 presentations given in this section (3 of which are available from the AOPC web page). General comments are described below; a list of all presentations and Q&A (not noted here in the general comments) are provided in section 5.

General comments:

A large amount of daily SLP data has been collated at KNMI as part of the EC funded ENSEMBLES project (Brandsma presentation). Not all is freely available and so the Group decided to formally ask for the data. Plans to digitise the KNMI log books were raised by Rob Allan: the Dutch data have all been digitised (and freely available from KNMI site). The colonial data, however, have not yet been digitised.

Historical monthly Japanese data from the 19th Century has recently been recovered in KNMI log books and digitised (Masumi presentation). Sub-daily data is available in the 1870s, but not yet digitised.

Philip Woodworth stressed the importance of SLP gridded analyses for tide gauge and satellite altimeter sea level work. Both monthly and daily data is needed for studies of long time series, in addition to the higher frequency products available from the analysis projects for the study of more recent sea level data. He mentioned that Doug Luther's involvement with the Group probably originated from Luther's interest in processes such as 5 day waves in the atmosphere and ocean, and that in Doug's absence he had been happy to represent the sea level community at this meeting.

7. Discussion of inclusion of winds in our remit

7.1 Current and future work

Shawn Smith described the work he and Mark Bourassa are undertaking at FSU.

They produce a monthly mean product from ships, buoys and drifters and Mark Bourassa is working on a satellite based product, using 'Seawinds on QuikSCAT' (e.g. Patoux & Brown, 2002, JAM, 41, p133-143). Their model is very good at assimilating scatterometer winds and pressure in a physically consistent way; their project will run for 3-4 years and will create gridded datasets over the global ocean, north of 30°S. Work is progressing initially over the most recent period; this will be extended over the historical period. Shawn will send on more details of the work done at COAPS to Rob Allan.

Val Swail reported on plans, together with Bridget Thomas, to develop a long term 150 year historical wind data set, using Ward and Hoskins technique (e.g. using MSLP).

7.2 Plans to include winds ...

Shawn Smith posed the question to the group: 'what problem are we most interested in: pressure from historical winds or pressure from satellite observations?'

Alexey Kaplan stressed that MSLP reconstructions will be helped by winds (see his presentation) and improving MSLP constructions is an important goal of the group. Val Swail also suggested that it is difficult to separate winds and pressure: much of the work on winds can be considered as mutually beneficial for MSLP analyses.

The group agreed to include winds in the Groups' terms of reference. However, the title of the group will remain unchanged.

8. Some recent analyses using MSLP data

There were two presentations given on this issue: one by Julie Jones and the other by Malcolm Haylock (both are available). Julie's talk on AAO reconstructions, using HadSLP2, highlighted a number of problems with HadSLP2 in the high southern latitudes that will be looked into by Tara Ansell and Rob Allan.

9. Work Plan

Issues raised in General discussion were:

- Work plan should be based on the Agenda items (nine issues listed here in section 2)
- Need to co-ordinate the digitising of data. Dennis Wheeler mentioned the digitisation that is planned for UK log books for the WW2 period.
- Daily averaged data – need to know what corrections have been applied
- Using composite series (e.g. Utrecht/DeBilt, Reykjavik/Stykkisholmur) and how to reference these. It was decided to keep the main data bank for raw data only and have a separate section for analyses and indices (where corrections have been applied). It was noted that while these series (e.g. regional average series) are not suitable for the reanalysis, they are good for other applications (i.e. climatological applications).

- Funding. May be possible to get some money for a meeting. Could try GEOSS or also explore possibility of support from GCOS (and AOPC). Phil Jones mentioned a GCOS Regional Workshop for South and Southwest Asia (they met in New Delhi in Oct 2004 and a regional action plan was drafted (contact is Bill Westermeyer: WWestermeyer@wmo.int)). It may be worth pursuing whether similar funding for a meeting can be found for the surface pressure working group.
- Next workshop to be held in 2 years time, hopefully with full funding.

3 Actions

- **Gil Compo** to change starting date of Azores series on AOPC web site
- **All regional co-ordinators** to consider their role and confirm involvement
- **Rob Allan and Gil Compo** to invite Gareth Marshall (BAS) to be a regional co-ordinator for the Antarctic region.
- **All/subgroup** feedback comments on ISPD format to Gil Compo
- **Group** to formally ask KNMI for access to data collated as part of ENSEMBLES
- **Group** to ask AOPC to change terms of reference to include winds. Title is to remain unchanged
- **Shawn Smith** to send information on winds and pressure work at COAPS to co-convenors.

4 Other recommendations/considerations

- All / Regional co-ordinators to help locate data sources from Northern Hemisphere charts (table of sources was provided).
- All feedback on priorities for Canadian digitisation: please contact Val Swail
- All: sub daily data for 20th Century analysis very welcome: please contact Gil Compo
- Group should pursue GCOS funding to maintain the website
- HDF5 should be used for ISPD
- Aim to digitise all variables
- Using winds to improve MSLP analyses should be pursued
- Developing a sub-daily MSLP dataset over the Northern Hemisphere should be encouraged

5 List of Presentations

Theme 2: International Surface pressure data bank.

Gil Compo: 'International Surface Pressure Data Bank' (presentation available)

Rob Allan: 'International Pressure Data Bank' (presentation available)

Theme 3: data archaeology and digitization.

1. **Joe Elms:** 'Climate Database Modernization Program (CDMP). Data Collections Being keyed that Contain Surface Pressure' (presentation available).

Tara Ansell asked about the WSSRD site: All scanned images are available from WSSRD (Web, search, store, retrieve and display). The site address is:

<http://www.ncdc.noaa.gov/oa/climate/cdmp/wssrd.html>

A login and password is required (please contact Cynthia.B.Karl@noaa.gov).

2. Scott Woodruff: 'ICOADS & Surface Pressure Improvements' (presentation available) ICOADS release 2.2 was discussed. With the decline in VOS ships, Scott mentioned that ARGO floats may be fitted with barometers in the future (this was raised at the JCOMM 2 meeting). Supplementary data are available on ICOADS website (Japanese Whaling data and Kobe collection and Russian RV obs). US Marine Met Journals are already digital, but are not yet translated or blended into ICOADS. Plans are afoot to digitize UK Log books and US Navy ships, and additional US merchant observations.

3. Manola Brunet: 'Potential for air pressure and climate data rescue from the sources held at the library of Ebro's Observatory' (presentation available)

Gil Compo asked whether the library would be willing to send volumes over-seas to be digitised. Manola indicated that they would probably allow the volumes to be scanned/photographed on site, but not sent away.

4. Alexey Kaplan: 'Data digitisation' (presentation available)

Use of OCR. Works well with monthly data. Currently set up for Russian volumes.

Modifications would be needed with other formats; however Alexey is happy to pass on his code to those interested.

5. Val Swail: 'Environment Canada's data digitization: priorities & current activities' (no OHPs)

As part of the EC-EMULATE project, Environment Canada has digitized/ provided data for Halifax, Montreal and St Johns. Some indication that data for 77 stations located north of 55 deg in Central and Eastern Arctic were supposedly destroyed, but this is being looked into. Priority list for digitization includes Hudson Bay company logs and the '77' stations north of 55 N (if they can be located), however they are open to any specific stations, periods or regions of interest – please let Val Swail know.

6. Phil Jones: 'Data sources for Greenland' (no OHPs)

Greenland temperatures back to 1784 have recently being digitized at CRU (with postdoc from Denmark, Bo Vinter). There are pressure data available too. We know that there are monthly data back to the mid 19th Century. Phil Jones also noted that the earliest observer (back in 1757) was Moravian and after leaving Greenland he went to Labrador. We should have data for this region!

Val Swail said that Xiaolan Wang (Environment Canada) has found some Moravian data and that it appears to be in German museums. Dennis Wheeler said that Jim Fleming from the University of Maine would have more information and that a good contact in Germany would be Connie Luedecke at: c.luedecke@lrz.uni-muenchen.de

7. Dennis Wheeler: 'Recovering ancient instrumental data: The example of the logbooks of ships of the Honourable East India Company (1785 – 1833)' (presentation available).

These logs provide a wealth of data and often follow different routes than more recent ships (e.g. provide data further south and east across the southern Indian Ocean). There is also some data in the Royal Navy log books, but not as detailed and accurate as the East India Company logs.

8. Rob Allan: 'Climatic data support initiative' (presentation not given due to lack of time; the presentation is available)

Theme 4: gridded historical MSLP products.

Tara Ansell: ‘Gridded historical MSLP products: existing and future plans’ (presentation available)

Alexey Kaplan: ‘Gridded Historical MSLP products’ (presentation available)

Theme 5: historical reanalysis.

Masao Kanamitsu: ‘The role of pressure and SST observations in reanalysis’

Gil Compo: ‘The feasibility of a Reanalysis without soundings’

Details of the fields produced and what will be available: There will be the same fields as NCEP/NCAR and 13 key fields for the 100 members. An ensemble mean and ensemble spread will also be given. NCEP and NCAR have both offered to host an archive

Theme 6: extension and reconstruction of long MSLP series and indices.

Theo Brandsma: ‘Current research on historical air-pressures at KNMI (the Netherlands)’ (presentation available)

Masumi Zaiki: ‘The 19th century pressure data in Japan’ (presentation available)

Rob Allan: ‘Extension and reconstruction of long MSLP series and indices’ (presentation available)

Philip Woodworth: ‘MSLP data requirements for Tide gauge corrections’ (no OHPs)

Theme 8: Some recent analyses using MSLP data.

Julie Jones: ‘Instrumental AAOI reconstructions and comparison with the HadSLP1/2 AAOIs and pattern nudging for assimilation of instrumental/proxy data’ (presentation available)

Malcolm Haylock: ‘Interdecadal changes in 1870-2003 Northern Hemisphere winter sea level pressure variability and relationship with temperature’ (presentation available)

5 References

Udias, A. (2003) ‘Searching the heavens and the Earth: the history of Jesuit observatories’, Dordrecht, Kluwer Academic Publishers.