Benchmarking Working Group Call #10
Friday 14th June 4pm BST (GMT+1), 3pm GMT,

Attending: Kate Willett (KW), Victor Venema (VV), Rachel Warren (RW), Lucie Vincent (LV), Enric Aguilar-online (EA), Ian Jolliffe-online (IJ), Matt Menne (MM), Peter Thorne (PT)

Not attending: Renate Auchmann (RA)

ACTIONS FROM PREVIOUS MEETING:
KW: to invite potential new members (Ingeborg Auer, Gregor Vertacnik, Dan Hollis) - DONE but I haven't invited Gregor because I don't have a free phone number for him to join the teleconference calls. This is a silly reason but I don't want him to incur any costs of his own - which could be considerable. I could ask if he is happy to be an electronic member?
KW: Ask Jay if we can use his? – NO TOLL FREE FOR SLOVAKIA EITHER.
IJ: to continue trying to get new validation experts on board.
KW: add link on our website to VV's post on benchmarking - DONE
KW: Circulate minutes - DONE
KW: Circulate call details for next week - DONE
KW: to see about guest speakers at next call - Lucie (Canada), Manola (Spain), Andrea (Meteomet project update)? - DONE
IJ: tidy up discussion on Team Validation
MM: Circulate meeting agenda when its ready - DONE
KW: sort out the next Team Validation call - DONE

ACTIONS FROM THIS MEETING:
KW: to see about guest speakers at next call - Manola (Spain), Andrea (Meteomet project update)? -
LV: check Kate's write up of her presentation on the minutes
Everyone: please fill this list (See Agenda item AOB) with contacts or contact them if you know them.
MM/LV/EA and ALL INTERESTED: read Victor's error world document which he will circulate again. - CIRCULATED
MM/CW: please provide known inhomogeneity details for USA to Kate
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AGENDA:
1) 5-10 minute overview of Canadian inhomogeneities by Lucie Vincent
(we hope to invite a few others to speak in the near future like Manola and Andrea Merlone)
See attached presentation from Lucie - LV_Temp_Inhomogeneities_Canada.pdf
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12000 stations across Canada - daily max and min T but many are very short, only 5-10 years.
Selected ~350 stations to homogenise. Metadata used to try and identify cause of detected inhomogeneities: change in station location, change in observing time, change to automation.
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South - density higher compared to North therefore easier to find inhomogeneities using neighbours. South - neighbours ~20km apart whereas North ~600km apart in places.

Very few very long stations - 19 from pre-1900s therefore hard to identify inhomogenieity further back in time.

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Most IH due to station moves - this occured at any date, 2-3 times for ~30% of stations. Probably an underestimate, especially further back in time due to sparsity of data. Most common during 1942-43-44 - ~10 % relocated from house/farms to newly built airports. Magnitude of shifts depends on the season. Some overlapping obs for ~6years. For example, daily max more effected by 2 degrees during summer but almost no change in winter. For daily min affected more in the winter by -2 degrees. Very rarely finding inhomogeneities of >3 degrees. Very difficult to detect <0.5 degree changes.

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Change in observing time - changed at any time in past but in 1961 daily minimum changed from afternoon to the morning. Affected ~30% of stations (the SYNOP stations). Caused bias in daily minimum by -0.4 (west) to -1(east) degree with only small seasonal variation. More pronounced in the eastern region - because it changed from 00 to 06 UTC - eastern region time closer to when real minimum would have occurred so bias is larger.

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Automation changes - since 1995. Stations would close and then reopen using automated systems. Small increasing shift at many stations towards end of time series - now a little over 50% of stations are automated - still increasing. 0.2-0.3 degrees positive shift. Occurring at same time as warming temperatures - so potential to enhance real trends. Adjustments have been applied but difficult to find.

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Example - 1930s moved away from screens on north facing walls, 1970s moved to airports, some moved to roof and then later moved from the roof.

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Website http://www.ec.gc.ca/dccha-ahccd/

ACTION: LV to check Kate's write up of her presentation on the minutes

2) Team Corruption carry on - Victor Venema

Next to the document sent around (error_worlds_update.doc), also "Section 6.3.2 Artificial inhomogeneities" of the HOME benchmarking paper is recommended reading. It describes the problems found in the HOME benchmark, which we should avoid doing again.

http://www.clim-past.net/8/89/2012/cp-8-89-2012.pdf

Structure of benchmark:
- Some worlds to study the influence of the properities of inhomogeneities that cause trend biases on how well we can remove them.
- Some worlds to study the influence of the seasonal cycle on homogenization skill.
- Some worlds for understanding the homogenization algorithms and to allow people to play with our data before submitting the real contribution.

Decisions for today:
1, Are the 10 blind worlds okay, remove or add worlds?

2. Are the parameterizations and parameters for the default world okay?
3. Are the 3 open worlds okay, remove or add worlds?

If we can find a consensus on this, we could start thinking about how to implement the ideas, for which we will need:
1. Regional information on spatially correlated breaks during short periods
2. A list of common and exotic inhomogeneities and how they would affect the data.

1, Are the 10 blind worlds okay, remove or add worlds?
Statistical inhomogeneities
LV: Are the gradual trends for the entire period?
VV: 30% become flat after, 30% trend return to original value, 30% normal random break (then continues flat). Any length - typical 45 years, 2deg per century.
PT: See Jones paper on London urban warming/warming saturation
Jones, P. D.2009The urban heat island in Central London and urban-related warming trends in Central London since 1900. Weather
For several Australian cities (Melbourne, Sydney, Hobart):
Trewin, Blair 2012 A daily homogenized temperature data set for Australia International Journal of Climatology
MM: Always positive? Found many negative too - due to other kinds of land use such as irrigation and reforestation.
VV: So 1 deg to 5 deg min to max size?
EA: many gradual trends do not last the whole length of the series. Urbanization is a good example of this. Madrid urban trend is over by ~1960!
LV: Is there any order of difficulty in these worlds?
VV: No order - investigating biases first (statistically, then physically) then seasonal cycle
LV: might be easier if there is some hierarchy
PT: Only need to order things really for communication - shouldn't be in order when we set them up as users may guess.
VV: have one without gradual trends.
KW: Could make sure this world has stations with similar abrupt changes that have and have not got gradual trends - then we can assess whether these make things more difficult on a station level?
VV: Maybe save analyses of gradual trends for another round - just focus on bias and seasonal cycle
KW: world looking at biases, world looking at gradual and world using an underlying clean dataset that is based on a different world e.g., one with no warming?
EA: this is a very good idea, so homogenizers do not have a previous idea on how the solution should look
VV: gradual/urban trends will be studied using USHCN study - so we may not need to cover it here.
MM: USHCN study varying things systematically to find breaking points of algorithms, global trying to understand uncertainties better.
PT: How many clean worlds are we creating? What mix of clean worlds (underlying reconstruction of climate change and natural variability) are we going to use to drive the error worlds?
VV: Open worlds should all be off distinct models?
KW: Should use just two clean worlds in the blind?
PT: May need to vary the white noise component?

VV: One model for each of three sectors of worlds?
VV: Keep it simple -
VV: Prefer to swap world to a 'no climate change' world rather than sacrificing exotic - useful for exploring things for next time round.
Inhomogeneities not mentioned in the document yet:
VV: In the Czech republic they had problem with a plastic Stevenson screen that let the sun in if the temperature was above 30(?) degrees.
KW: Sawtooth types as an 'exotic' one.
VV: Yes - sawtooth for 10%.
MM: generally a good idea
VV: World is a nice way of trying things out for next cycle

Studying the influence of the seasonal cycle
These blind worlds should be analysed together other related worlds

PT: All the error models vary multiple things, which is fine. But one thing that struck me was there is no case whereby we can ascertain the effects of the underlying trend/variability on the break detection / adjustments. In the USHCN benchmarks we projected exactly the same break structure on four distinct background worlds. This then allows to ascertain whether presence of e.g an underlying trend confounds algorithms. Is it worth considering one or two cases being like this to investigate this aspect?

SUMMARY:
Gradual inhomogeneities do not need to be studied here eplicitly as there are plans underway to do this in smaller, more targeted projects.

2. Are the parameterizations and parameters for the default world okay?
A - Size distribution of random (independent and unbiased) breaks.
B - Size of biased (ones that influence the region or global mean trends) breaks.
VV: Combine this category with E?)
EA: a mixture of small biases (0.2ºC, such as Tmin in screen, almost no seasonal cycle) to > 1ºC (same change, but fot tmax, with a seasonal cycle)
VV: We only have Tmean in this cycle of the benchmark.
EA: Ok
C - Noise or walk
D - Frequency of biased breaks.
EA: I think a reasonable estimate for this is 2 or 3 every 100 years. For example, many networks change screens in the early 1900s and changed to AWS in the late 1900s or early 2000s.
E - Size, correlation and period of spatially clustered breaks.
F - Number of breaks.
G - Seasonal cycle of breaks.
H - Gradual inhomogeneities, local trends.

SUMMARY:
Out of time to discuss

3. Are the 3 open worlds okay, remove or add worlds?
#O1. No inhomogeneities.

#O2. Few, but large breaks. Best guess world for the West, but the random component of the inhomogeneities is not given by a normal distribution,but either -1 or+1 degree. No gradual inhomogeneities.

#O3.Best guess world for the West, but no seasonal cycle.

SUMMARY:
Out of time to discuss

3) Workshop update
Webex or call only? To be decided.
RW: I probably won't be able to join you on the calls as I'm helping with a conference that week, but will make sure I keep up to date with/ comment on the minutes

4) AOB
KW: Regional Inhomogeneity summaries - so far we have info from:
Spain
Switzerland
Poland
Slovenia
Russia
Australia
Canada
UK (pending)
Italy
Netherlands

Possible contacts needed?
South American countries - Mathilde Rusticucci?
EA: after and ETCCDI-like workshop we prepared a paper including homogenization of most countries in SA. Maria Skansi (Argentina) was the first author.
EA: now we're preparing another round of homogenization with Bolivia, Ecuador, Peru and Venezuela. Peru has paralell AWS/CON measeurements and would be happy to contribute. Clara Rojas is the name of the person to be contacted.
VV: Great contacts.
USA - Matt/Claude? Cooler maxes, warmer mins
Africa
France
Germany
Austria
Czech Republic - Petr Stepanak?
Scandinavia
Nordhom project involves the Scandinavian countries. They're hosting a homogenization internal workshop in November. Erik Engstrom is the project manager.
Other European countries?
New Zealand
China
Japan

South East Asian countries
India
Middle East
ACTION: Everyone - please fill this list with contacts or contact them if you know them.
ACTION: MM/CW: please provide details for USA

5) Next Call:
Extra pre-workshop call on Team Corruption Tuesday 18th June 4pm BST..
ACTION: Matt/Lucie/Enric - read Victor's error world document.
Team Validation call - Thursday 20th June 4pm BST / 3pm GMT / 11am EST

NOTES: