

1 International Surface Temperature Initiative

3 Benchmarking and Assessment Working Group Terms of Reference

5 Draft 12/12/13

7 *1. Initiative background*

9 The International Surface Temperature Initiative, endorsed by the WMO Commission for
10 Climatology at its 15th session, was launched at a meeting at the UK Met Office, Exeter in
11 September 2010. To meet the requirements placed on climate science in the 21st
12 Century, it is necessary to create a suite of high quality and high resolution data-
13 products, with openness, transparency, verification, and user tools. Such a range of
14 estimates, and common framework, would aid decision making at national and
15 international scales and inform adaptation strategies. Crucially, this Initiative is
16 envisaged to be international and interdisciplinary - involving climate scientists,
17 statisticians, metrologists and software engineers from around the world. The Initiative
18 should encompass: data rescue and digitisation; an open, transparent and
19 comprehensive databank with versioning and provenance tracking; a data-portal for
20 multiple products estimating local, regional and global scale changes; a common
21 benchmarking and assessment process; and platforms for data download,
22 intercomparison and visualization.

24 *2. Benchmarking and Assessment working group purpose*

26 2.1 The Benchmarking and Assessment working group exists to facilitate use of a robust,
27 independent and useful common benchmarking and assessment system for
28 temperature data-product creation methodologies, specifically the homogenisation
29 aspect, to aid product intercomparison, uncertainty quantification and
30 methodological advancement.

32 2.2 The Benchmarking and Assessment working group are responsible for the design of
33 the benchmarks which include several analog-clean-worlds and analog-error-worlds
34 with identical spatial coverage to the real station network as far as possible. The
35 creation software for these will be set up by the working group with tunable
36 parameters to specify the clean-worlds and error-worlds. This software will be open
37 source (e.g., R, python) such that unique analog-clean-worlds and analog-error-
38 worlds can be easily created for each benchmarking cycle. The concepts of this
39 methodology (not the specific parameters used to create the analogs) should be
40 clearly documented such that it is reproducible.

- 41 ○ The analog-clean-world data will largely mimic the consolidated master
42 databank and must represent real world characteristics as far as possible
43 including spatio-temporal completeness and intra- and inter-station
44 characteristics.

- 1 ○ The analog-error-worlds should reflect realistic scenarios of
2 inhomogeneities and be designed to answer a set of questions of the
3 data-product creation methods which will be established at the beginning
4 of each cycle.
5
- 6 2.3 The working group is responsible for the co-ordination of benchmarking cycles.
7 These are envisaged to be ~3 year cycles incorporating benchmark development and
8 creation, analog-error-worlds release, advocacy of benchmark testing and support
9 for users, assessment, later release of the analog-clean-world(s) and wrap-up
10 workshop and analysis publication. The workshop should bring together working
11 group members and users, perhaps online, to establish where the benchmarks
12 worked well, where they could be improved and facilitate use of the benchmarks for
13 methodological advancement.
14
- 15 2.4 The working group will work to improve understanding on inhomogeneities that
16 affect the surface temperature record. A list of known region-wide inhomogeneities
17 will be maintained in addition to any improvements in understanding as a result of
18 the benchmark process. If at some point these become sufficiently extensive they
19 may be written up in a peer-reviewed article.
20
- 21 2.5 The working group will document the benchmark creation concepts and
22 methodologies in several peer-reviewed articles. These may include the broad error-
23 world concepts and types of inhomogeneity to be included but not specify precise
24 inhomogeneities applied to specific stations.
25
- 26 2.6 The working group will co-ordinate a report at the end of each cycle analysing the
27 strengths and weaknesses of the benchmark analogs for that cycle and outlining
28 improvements for the next cycle which may be submitted to peer review.
29
- 30 2.7 The working group will act as advocates of benchmarking and promotion of its
31 benefits throughout their time in the group. This can be achieved through personal
32 contact and through presentations at conferences and workshops. All presentations
33 and posters to which the conference hosts stipulate no restrictions are made
34 available through our website.
35
- 36 2.8 The working group has ultimate responsibility for the Benchmarking and Assessment
37 page on the Surface Temperature Initiative website
38 ([http://www.surfacetemperatures.org/benchmarking-and-assessment-working-](http://www.surfacetemperatures.org/benchmarking-and-assessment-working-group)
39 [group](http://www.surfacetemperatures.org/benchmarking-and-assessment-working-group)) and the blogspot <http://surftempbenchmarking.blogspot.com>. The blog is
40 publicly open and anyone can add comments although only members can post initial
41 threads. Posts are linked from the website.
42
- 43 2.9 The working group will do its best to achieve all targets set but given the voluntary
44 nature of this group there may be times when deadlines have to be changed. A table

1 of planned work, with dates for completion, is maintained on the website.

2 3 *3. Reporting*

4
5 3.1 The working group shall contribute to the annual Steering Committee report to
6 sponsors to be prepared by January 15th of each year. The working group
7 contribution shall be submitted to the Steering Committee in October-December of
8 the previous year. This report shall:

- 9 ○ Highlight progress in the prior year
- 10 ○ Detail issues that delayed progress
- 11 ○ Provide a detailed plan for the coming year and indicative plans
- 12 thereafter

13
14 3.2 The report should be succinct yet comprehensible to a lay audience and highlighting
15 all salient issues.

- 16 ○ The report will be *published without restriction on the web* at time of
17 submission to sponsors and moderated public comments solicited
18 through a blog or similar forum.

19
20 3.3 The working group will be expected to respond in a timely manner to additional
21 reasonable reporting requests from the Steering Committee raised on an *ad hoc*
22 basis.

23
24 3.4 Defined outputs from the Implementation Plan will be reported to the Steering
25 Committee and posted on the web upon completion.

26 27 28 *4. Coordination with Initiative activities*

29
30 4.1 The working group will answer to the Steering Committee who coordinate the
31 Initiative.

32
33 4.2 The chair of the Steering Committee will have ex-officio membership on the working
34 group. The chair of the working group will be a member of the Steering Committee.

35
36 4.3 The chair of the working group will give verbal reports to the Steering Committee at
37 each meeting or designate the task if they are unable to attend in person.

38
39 4.4 The working group chair will produce reports annually by end of November for
40 consideration and incorporation into the main overarching report to sponsors.

- 41 ○ These reports will be published on the web in a timely manner.

42 43 44 *5. Mode of operation*

- 1
2 5.1 The working group will communicate primarily through regular teleconferences
3 occurring as deemed necessary by committee members. Online document
4 discussions, ad-hoc meetings and workshops (where funding becomes available)
5 may also be used.
- 6 ○ Approved minutes from these events will be posted as soon as possible
7 thereafter and at a minimum within four weeks through
8 [www.surfacetemperatures.org/benchmarking-and-assessment-working-](http://www.surfacetemperatures.org/benchmarking-and-assessment-working-group)
9 [group](http://www.surfacetemperatures.org/benchmarking-and-assessment-working-group) or another web based portal without restriction.
- 10
11 5.2 Where a quoracy (one third) of working group members are in attendance at a
12 scientific meeting a side-meeting may be deemed to be in lieu of a teleconference of
13 the working group as a whole.
- 14 ○ Regardless, side meetings are encouraged and a brief summary from any
15 such meeting should be reported to the group as a whole at its next
16 meeting.
- 17
18 5.3 An email list exists to facilitate discussion for the main group. Sub-group email lists
19 exist for each of the key areas of work. These are maintained by the group chair.
20 Only members of the lists may post to these addresses.
- 21 ○ benchmarking@surfacetemperatures.org
 - 22 ○ teamcreation@surfacetemperatures.org
 - 23 ○ teamcorruption@surfacetemperatures.org
 - 24 ○ teamvalidation@surfacetemperatures.org
- 25
26 5.4 A blogspot exists to facilitate discussion.
- 27 ○ <http://surftempbenchmarking.blogspot.com>

30 6. Membership

31
32 We will strive to achieve a diverse working group with members from various cultural,
33 climatic, organizational and scientific backgrounds. Membership will consist of at a
34 minimum eight individuals at any time.

35
36 6.1 Additional members are considered at the discretion of the working group or under
37 the advisement of Steering Committee.

38
39 6.2 One senior representative from each Initiative sponsor is welcome to sit in on
40 teleconferences on an *ad hoc* basis.

41
42 6.3 Membership will be reconsidered on a bi-annual basis or at the request of individual
43 members.

44

1 6.4 Members are expected to make all reasonable efforts to attend teleconferences and
2 provide relevant input by email/blogpost in advance in the event of non-attendance.

3
4 6.5 The working group is an entirely voluntary commitment so there are no explicit
5 workload requirements, beyond reasonable expectations of discharging the
6 activities detailed in these terms of reference or efforts volunteered and minuted in
7 agreed meeting notes.

8
9 6.6 Members may resign from the working group at any time by informing the chair in
10 writing of their intention to do so. They are encouraged to suggest replacement
11 members.

12
13 6.7 Current membership is detailed in Annex A.

14 15 16 *7. Terms of reference revision*

17
18 7.1 Terms of reference and membership will be revised no later than three years from
19 the version date of this document.

- 20 ○ Revision can be requested by a group comprising of at least three
21 members or by any single Initiative sponsor.

1 **Annex A**

2

3 **Membership (current 12/6/13)**

4

5 Kate Willett (UKMO Hadley Centre, UK) (Chair)

6 Claude Williams (NCDC, USA)

7 Ian Jolliffe (Exeter Climate Systems, University of Exeter, UK)

8 Robert Lund (Department of Mathematical Sciences, Clemson University, USA)

9 Lisa Alexander (Climate Change Research Centre, University of New South Wales,
10 Australia)

11 Stefan Brönniman (University of Bern, Switzerland)

12 Lucie A. Vincent (Climate Research Division, Environment Canada, Canada)

13 Steve Easterbrook (Department of Computer Science, University of Toronto, Canada)

14 Victor Venema (Meteorologisches Institut, University of Bonn, Germany)

15 David Berry (National Oceanography Centre, Southampton, UK)

16 Rachel Warren (College of Engineering, Mathematics and Physical Sciences, University of
17 Exeter, UK)

18 Giuseppina Lopardo (Istituto Nazionale di Ricerca Metrologica (INRiM), Italy)

19 Renate Auchmann (Oeschger Center for Climate Change Research & Institute of
20 Geography, University of Bern, Switzerland)

21 Enric Aguilar (Centre for Climate Change, Universitat Rovira i Virgili, Spain)

22 Matt Menne (NCDC, USA)

23 Colin Gallagher (Department of Mathematical Sciences, Clemson University, USA)

24 Zeke Hausfather (Berkeley Earth, USA)

25 Thordis Thorarinsdottir (Statistical Analysis, Pattern Recognition, and Image Analysis
26 (SAMBA), Nowegian Computing Centre, Norway)

27

28 Ex-officio:

29 Peter Thorne (NERSC, Norway)