

1 Surface Temperature Initiative

3 Benchmarking and Assessment Working Group Terms of Reference

5 Draft 24/5/11

7 1. Initiative background

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

23 2. Benchmarking and Assessment working group purpose

25 2.1 The Benchmarking and Assessment working group exists to facilitate use of a robust,
26 independent and useful common benchmarking and assessment system for
27 temperature data-product creation methodologies, specifically the homogenisation
28 aspect, to aid product intercomparison, uncertainty quantification and methodological
29 advancement.

31 2.2 The Benchmarking and Assessment working group are responsible for the design of
32 the benchmark analog-known-worlds and analog-error-worlds. The creation software
33 for these will be set up by the working group with tunable parameters to specify the
34 known-worlds and error-worlds. This software will be open source such that unique
35 analog-known-worlds and analog-error-worlds can be easily created for each
36 benchmarking cycle. The concepts of this methodology (not the specific parameters
37 used to create the analogs) should be clearly documented such that it is reproducible.

- 38 ○ The analog-known-world data will largely mimic the consolidated master
- 39 databank and must represent real world characteristics as far as possible.
- 40 ○ The analog-error-worlds should reflect realistic scenarios of
- 41 inhomogeneities and be designed to answer a set of questions of the data-
- 42 product creation methods which will be established at the beginning of
- 43 each cycle. These questions should be conceptually broad (How do
- 44 algorithms cope in a world with geographically clustered and isolated
- 45 discontinuities?) rather than specific (Can algorithms cope if all
- 46 discontinuities are small and frequent?) and generally spread from an

1 overly optimistic scenario to an overly pessimistic scenario.

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- 3 2.3 The working group is responsible for the co-ordination of benchmarking cycles.
- 4 These are 3 year cycles incorporating benchmark development and creation, analog-
- 5 error-worlds release, advocacy of benchmark testing and support for users,
- 6 assessment, later release of the analog-known-world(s) and wrap-up workshop and
- 7 analysis publication. The workshop should bring together working group members
- 8 and users, perhaps online, to establish where the benchmarks worked well, where they
- 9 could be improved and facilitate use of the benchmarks for methodological
- 10 advancement.
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- 12 2.4 The working group will write an overview paper bringing together the latest
- 13 understanding on inhomogeneities that affect the surface temperature record.
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- 15 2.5 The working group will document the benchmark creation concepts and methodology
- 16 in a peer review journal article and publish with an initial release of a set of both
- 17 analog-known-world(s) and analog-error-models. This will include the broad error-
- 18 world concepts and types of inhomogeneity to be included but not specify precise
- 19 inhomogeneities applied to specific stations.
- 20
- 21 2.6 The working group will co-ordinate a report at the end of each cycle analysing the
- 22 strengths and weaknesses of the benchmark analogs for that cycle and outlining
- 23 improvements for the next cycle which may be submitted to peer review.
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- 25 2.7 The working group will act as advocates of benchmarking and promotion of its
- 26 benefits throughout their time in the group. This can be achieved through personal
- 27 contact and through presentations at conferences and workshops.
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- 29 2.8 The working group has ultimate responsibility for the Benchmarking and Assessment
- 30 page on the Surface Temperature Initiative website
- 31 (<http://www.surface temperatures.org/benchmarking-and-assessment-working-group>)
- 32 and the blogspot <http://surftempbenchmarking.blogspot.com>. The blog is publicly
- 33 open and anyone can add comments although only members can post initial threads.
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35 3. *Reporting*

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- 37 3.1 The working group shall contribute to the annual Steering Committee report to
- 38 sponsors to be prepared by January 15th of each year. The working group contribution
- 39 shall be submitted to the Steering Committee in October of the previous year. This
- 40 report shall:
- 41 ○ Highlight progress in the prior year
- 42 ○ Provide a detailed plan for the coming year and indicative plans thereafter
- 43 ○ Highlight substantive issues where sponsor input is required
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- 45 3.2 The report should be as short as possible whilst being comprehensible to a lay
- 46 audience and highlighting all salient issues.

- 1 ○ The report will be *published without restriction on the web* at time of
2 submission to sponsors and moderated public comments solicited through
3 a blog or similar forum.
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6 3.3 The working group will be expected to respond in a timely manner to additional
7 reasonable reporting requests from the Steering Committee raised on an *ad hoc* basis.
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9 3.4 Defined outputs from the Implementation Plan will be reported to the Steering
10 Committee and posted on the web upon completion.
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12 4. *Coordination with Initiative activities*

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14 4.1 The working group will answer to the Steering Committee who coordinate the
15 Initiative.
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17 4.2 The chair of the Steering Committee will have *ex-officio* membership on the working
18 group. The chair of the working group will be a member of the Steering Committee.
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20 4.3 The chair of the working group will give verbal reports to the Steering Committee at
21 each meeting.
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23 4.4 The working group chair will produce reports annually by October 15th for
24 consideration and incorporation into the main overarching report to sponsors.

- 25 ○ These reports will be published on the web in a timely manner.
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28 5. *Mode of operation*

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30 5.1 The working group will communicate primarily through regular teleconferences
31 occurring as deemed necessary by committee members.

- 32 ○ Approved minutes from these calls will be posted as soon as possible
33 thereafter and at a minimum within four weeks through
34 [www.surfacetemperatures.org/benchmarking-and-assessment-working-](http://www.surfacetemperatures.org/benchmarking-and-assessment-working-group)
35 [group](http://www.surfacetemperatures.org/benchmarking-and-assessment-working-group) or another web based portal without restriction.
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37 5.2 Where a quoracy (one third) of working group members are in attendance at a
38 scientific meeting a side-meeting may be deemed to be in lieu of a teleconference of
39 the working group as a whole.

- 40 ○ Regardless, side meetings are encouraged and a brief summary from any
41 such meeting should be reported to the Committee as a whole at its next
42 meeting.
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46 5.3 An email list exists to facilitate discussion.

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5.4 A blogspot exists to facilitate discussion.

6. Membership

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

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

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

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

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

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

6.6 Current membership is detailed in Annex A.

7. Terms of reference revision

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

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

1 **Annex A**

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3 **Membership (current 4/4/11)**

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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 Olivier Mestre (Meteo France, France)

12 Stefan Bronniman (University of Bern, Switzerland)

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

14 Aiguo Dai (Climate and Global Dynamics Division, NCAR, USA)

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

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

17 Peter Thorne (CICS-NCDC, USA) (ex-officio)