GHRSST REQUIREMENTS

(Submitted by the Secretatiats)

Summary and Purpose of the Document

This document provides information on latest developments with regard to the requirements from the GODAE High-Resolution SST Pilot Project (GHRSST) for high-resolution SST drifter data.

ACTION PROPOSED

The Panel will review the information contained in this report and comment and make decisions or recommendations as appropriate. See part A for the details of recommended actions.

Appendices:  
A. Letter from GHRSST; and
B. Amendments to the requirements expressed in the letter.
The Panel recalled the discussions at its previous Session where it reviewed again the requirements expressed by the GCOS-GOOS-WCRP Ocean Observations Panel for Climate at its twelfth Session (OOPC-12), Paris, France, 2 - 5 May 2007. These included, in particular, the recording and transmission of hourly SST data in order to be able to resolve the diurnal cycle of the SST with accuracy required by the GODAE High-Resolution SST Pilot Project (GHRSSST). The Panel had noted that the PTT real-time clock could be used with sufficient accuracy. On the other hand, accurate real-time clocks have been installed on some prototypes.

During the last intersessional period, the Director of the Group for High-Resolution SST (GHRSSST) International Project Office, Dr Craig Donlon, wrote to the DBCP Chairperson in order to refine those requirements and formally ask the DBCP to consider addressing them through the development of appropriate technology. A copy of the letter is attached in Appendix A.

The letter resulted in some informal discussions between DBCP and GHRSSST experts. The conclusions from those discussions are provided in Appendix B.

The GHRSSST community has expressed interest in understanding in situ measurements further, and in communicating the developments in satellite SSTs. The Panel may consider organizing a small workshop at an appropriate time.

Appendices: 2
David Meldrum, Chair of DBCP,  
Scottish Association for Marine Science  
Dunstaffnage Marine Laboratory  
Dunbeg  
Oban, Scotland  
PA37 1QA  
United Kingdom

Re. Statement on drifting buoy reporting from Diurnal Variability  
Working Group of GHRSSST

Dear David:

Following a presentation made by Ed Harrison at the final International GODAE Steering Team (IGST) meeting, Washington DC, 24th June 2003, in which it was reported that "It is now feasible to get more frequent diurnal time-scale observations from surface drifters", I am writing to you on behalf of the Group for High Resolution Sea Surface Temperature (GHRSSST) concerning the future reporting requirement for Sea Surface Temperature from drifting buoys.

Consultation has been undertaken across the GHRSSST framework but in particular from the SST Uncertainties and Validation Group (STVAL) and the Diurnal Variability Working Group (D VWG) to address SST reports from drifting buoys. Within the GHRSSST framework, the Diurnal Variability Working Group (D VWG) seeks to observe, understand, model and parameterize near-surface ocean warming on sub-daily timescales. These terms of reference are driven by requirements of high resolution analysis for operational oceanography and for SST re-analysis for oceanography and climate. The D VWG has considered the uses of drifting buoys in the light of science requirements and of Diurnal Variability Analysis Centres (DVACs) that are planned within the future GHRSSST system. DVACs are tasked with routine quantitative now-casting of hourly diurnal variability on a global basis.

The GHRSSST recommendations for reporting SST from drifting buoys are:

(1) That comprehensive hourly reporting from drifting buoys as standard will be of immediate benefit to fundamental knowledge of diurnal variability globally noting that such reporting is very likely to be heavily utilized within GHRSSST diurnal variability and validation activities immediately and in the future by operational DVAC.

(2) That reporting of the nominal or design depth of drifting buoy SSTs to a precision of order 10 cm is encouraged to facilitate diurnal variability analysis.

(3) That precision of reporting of geographical location to ~0.01° is important within high-resolution analysis, since spatially variability in diurnal warming events is significant at scales less than 0.1°. Accuracy of geographical location is also a significant issue with respect to validation of high resolution SSTs (~1km grids requiring accuracy of 0.05km in location error) and analyses based on satellite data.

(4) That it would be advantageous both for analyzing the diurnal cycle and for satellite SST validation if drifting buoy SSTs were routinely reported with a precision better than 0.1 K (e.g., to 0.01 K).

(5) That the netCDF CF-1.3 standard namo table is adopted for use by reporting agencies.

(6) That the time-accuracy required for the purpose of tracking the maximum rates of change associated with large diurnal variations is of order ±5 minutes.
(7) That it is not necessary for purposes of diurnal variability analysis or satellite SST validation to have hourly reports made on or close to integer UTC hours.

I and the international GHRSST Science Team are available to assist you in working effectively within the GHRSST framework and I urge you to take advantage of our expertise as you feel most appropriate.

With best regards,

Dr. Craig Donlon
(Director of the Group for High Resolution SST (GHRSST) International Project Office)

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Eliane Charpentier (JCCM)
Ed Harrison (NOAA)
Kirsten Willer-Becker (GODAE-PO)
Hester Yipia (Technical Coordinator DBCP/SST)
Mathieu Belbeoch (JCOMMOPS)
Albert Fischer (JCCM)
Chris Merchant (GHRSST DVWG)
Gary Corlett (GHRSST SVAL)
Pierre LeBorgne (GHRSST SVAL)
AMENDMENTS TO REQUIREMENTS EXPRESSED IN THE LETTER

The amendments below are numbered according to the same sequence as in the letter in Appendix A, and are intended to clarify the GHRSSST recommendations for reporting SST from drifting following subsequent discussions. These amendments were submitted by Dr C. J. Merchant (University of Edinburgh, United Kingdom) on behalf of GHRSSST, and resulted from e-mail exchanges between the DBCP and GHRSSST experts after the letter was sent to the DBCP Chairperson.

(1) [No amendment];

(2) Reporting in metadata of the nominal or design depth in calm water of the drifting buoy SST to an absolute accuracy of ±5 cm is encouraged to facilitate diurnal variability analysis;

(3) Reporting of geographical location with an absolute accuracy of ±0.5 km or better is important for high-resolution SST analysis and satellite SST validation. (Calculation of hourly velocity vectors arose in the discussions, and would require ±0.01 km resolution.);

(4) Absolute accuracy of drifting buoy SST of ±0.05 K is recommended based on the needs of satellite SST validation, with SSTs reported with a resolution of 0.01 K (to fully resolve diurnal cycles in SST);

(5) [No amendment];

(6) Reporting of the time of SST measurement to an absolute accuracy of ±5 minutes; and

(7) Reporting at hourly intervals (for purposes of matching to satellite observation and resolving diurnal cycles in time), but there is no requirement that the reports be made on or close to integer UTC hours.