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Overall Achievements of Medspiration

Review of the Overall Achievements of Medspiration

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The question underlying this talk

What difference has
ESA's support for the Medspiration Project
made to the status of
satellite measurement of SST
in 2008 ?



Outline of Talk

- A brief overview of how Medspiration has made an impact in the sphere of “Earth Observation for public good”
 - ❖ Details to come in subsequent talks today
- Pioneering the technical implementation of the GHRSSST concept for harmonisation of diverse SST products
- Role of Medspiration in the evolution of GHRSSST to become the *de facto* focus for international co-ordination of SST monitoring from satellites
- Stimulating the user base for GHRSSST products
- Enabling the growth of new applications of the GHRSSST approach – new analysis products and their diverse uses
- Creating a European consensus for SST co-operation
 - ❖ Enabling Medspiration to gently become redundant !



Starting point - the GODAE Challenge

- GODAE's high resolution challenge to the SST community
- *“Develop a global, high-resolution sea surface temperature analysis with proper consideration of the skin effect and sufficient temporal resolution to resolve the diurnal cycle, that is available in real-time for all environmental and climate applications”*
- Spatial resolution < 10 km : Resolve diurnal cycle
- Accuracy target better than 0.2 K
- Near-real time analysis (~24 h)



The Medspiration Concept

- ESA's goal in creating Medspiration
 - ❖ To support development of a prototype European RDAC (regional data assembly centre) within the GHRSSST framework
 - ❖ To encourage the establishment of GHRSSST as the focus of international collaboration on SST products
- Specific objectives of the Medspiration Service
 - ❖ Develop the software systems to support the Service
 - ❖ Operate the service by delivering specific products
 - ◆ L2P products for most SST products over the European region
 - ◆ L4 analysis (2 km resolution) over the Mediterranean Sea
 - ◆ Populate a match-up database (MDB) for Medspiration products
 - ◆ Produce Medspiration high resolution diagnostic data set (HRDDS)
 - ❖ Develop a user base for Medspiration products



Has Medspiration achieved its goals?

- We have met the specific objectives
- Developed, tested and implemented the software
- Established the data delivery Service
- Fulfilled the requirements of the contract within 2 years.

- We started to develop a user base
- Following demand from users, ESA extended the project, ultimately for a further 35 months

- We proved the concept of the GHRSSST approach when users continued to download the data and started to rely on it



How much data have our users downloaded directly from Ifremer ?

- Since Medspiration started producing in March 2005, to Oct 2008 users^a have received or downloaded **440 324** L2P files

- ❖ **119 938** were AATSR,
- ❖ **29 931** were NAR and
- ❖ **72 430** were SEVIRI

a.) Note that these figures exclude files distributed to GDAC or to NOCS for the HRDDS.

- In the same period users^a have received **80 382** L4 files

- Average uptake per file over Medspiration lifetime

❖ AATSR = 6.8	9.6	during
❖ NAR = 6.2	14.4	last
❖ SEVIRI = 6.7	9.7	three
❖ L4 = 30.0	42.4	months

- These figures do not include Medspiration files downloaded from GDAC or LTSRF which account for the major institutional users of global SST data



Have we met ESA's wider goals ?

- Has Medspiration helped to establish GHRSSST as the focus for international collaboration on SST products ?

YES

- **But how ?**
- It helped to cement the EU-RDAC team together
 - ❖ The group drew in many of the SST players across Europe
- It focused our broad scientific interests into specific action
 - ❖ It prompted us to switch from “just talking” to “doing something”
 - ❖ Scientific understanding of the issues → data processing specification → software prototype → operational service
- Timely launch of the Medspiration ITT to serve GHRSSST in Europe prompted international response in GHRSSST
 - ❖ Stimulated focused funded projects like MISST



Impact of Medspiration within GHRSSST

- Established pressure for agreement on the first working data processing model – GDS 1.5
- 2003, GHRSSST S-T meeting Pasadena
 - ❖ An influx of (mainly French) experienced young data engineers forced the discussion onto specific issues
 - ❖ Brought new blood into the old GHRSSST team
 - ❖ Medspiration's multinational team helped to promote the collaborative spirit within GHRSSST as a whole
- Opened up the benefits of AATSR to international use
 - ❖ Made AATSR data available
 - ❖ New format enabled AATSR use alongside other SST products
 - ❖ International users discovered the unique quality of (A)ATSR
 - ❖ This in turn fed back to ESA's plans for Sentinel SST



ESA promoted the user-led approach for Medspiration

- In the Medspiration ITT the project was clearly pitched as developing a service for users
- GHRSSST-PP provided the user requirements
- ESA's project oversight based on consultation meetings
 - ❖ Users were given influence
 - ❖ The programme was changed quite radically in response to users' needs
 - ❖ Security and prolongation of operational data supply outweighed scientific interests
- The main outcome of this approach was that users had confidence to develop operational applications of our data
 - ❖ This led to several new SST analysis products
 - ❖ L2P data started to be assimilated in ocean forecasts



The proliferation of L4 Analyses

- There are now at least 8 global analyses of SST produced by various users, several completely new
 - ❖ OSTIA, ODYSSEA etc.
- All make some use of Medspiration products
- Pre-existing analyses were upgraded to use Medspiration inputs
- The benefits of the high quality and stable AATSR products were properly appreciated
 - ❖ Improved bias adjustment for blending SST from multiple sources
 - ❖ More reliable high resolution analyses
 - ❖ Increasingly widespread adoption of the new analyses for operational tasks such as NWP



Diversity of new applications of SST products

Ocean Forecasting



Modern Ocean Forecasting systems provide a full 4-dimensional description of the ocean at various vertical and horizontal spatial

resolutions. SST data are used as a boundary conditions and in data assimilation schemes within these model systems.

[more>](#)

Research & Development



There is a great deal of R&D taking place by groups both using and producing satellite SST maps.

Understanding the impact of diurnal variability and the difference between SST_{skin} and SST_{depth} are key issues for the GHRSSST-PP.

[more>](#)

Weather Forecasting



Numerical Weather Prediction Systems require SST as a bottom boundary condition and can, in certain cases, have an

important impact on the forecasts e.g., fog formation, cyclogenesis, hurricane intensity and storm track forecast, air-sea flux calculations.

[more>](#)

Climate and Seasonal Forecasting



Accurate maps of SST are arguably one of the best climate indicators in their own right. Statistical Seasonal forecasts are

based predictors derived from tropical Atlantic and Tropical Pacific SST indices and an accurate time-series of SST is required to initialise dynamical seasonal forecasts using coupled ocean-atmosphere seasonal prediction models.

[more>](#)

Travel and Tourism



What's the temperature of the sea going to be on the beach at your holiday destination? Find out today using GHRSSST-PP data

products!

Today's Data



There are several SST analysis systems running within the framework of GHRSSST-PP providing daily L4 gridded data products.

[more>](#)

See the GHRSSST web site

And Craig's talk in the next session



Conclusion

- Medspiration has largely done the job it was given
- Although it is difficult to quantify the full extent of its usage, evidence of its worldwide impact can be found in:
 - ❖ Operational dependence: Its data products are now being used by several agencies as part of operational forecasting systems
 - ❖ There is a wide international consensus that GHRSSST and its approach represent the way forward for effective SST monitoring
 - ❖ Space agencies are planning their SST missions to fit in to the GHRSSST synergetic model
 - ❖ There is a growing public demand for timely SST data, and there are media outlets primed to supply them
- Within Europe we can find:-
 - ❖ A spirit of co-operation and collaboration between the producer agencies, the institutional users and the EO-SST scientists
 - ❖ An SST-TAC with clear goals, based on existing experience



Where would we be without Medspiration ?

Thank you ESA !

