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Stephen Pascoe
STFC

A better understanding of the environment

RAL scientific team works with Tessella to make complex environmental data available for scientific research

There have never been more interesting times in environmental sciences. As public and scientific interest in the global environment increases, it becomes ever more important to have accurate, authoritative sources of environmental data. Storing this data and making it available to scientists across the UK is a full-time job.

In rural Oxfordshire, Stephen Pascoe, Matt Pritchard and a team of scientists maintain vast archives of meteorological, atmospheric and imagery data, which are vital to help researchers around the world understand the state of the environment. At the British Atmospheric Data Centre and NERC Earth Observation Data Centre, both based at Rutherford Appleton Laboratory on the Harwell Science & Innovation Campus, Stephen and Matt aggregate data collected from climate simulations, ground-based weather stations and satellites, and make the data available to the wider scientific community.

Making sense of the data

Matt comments: “Our work here is really important for scientific research. Our remit is to make the

data accessible, which means providing services for discovery and interpretation, and to ensure their long-term preservation. The complexity, heterogeneity and volume of these data present daily challenges, which can only be overcome with the application of the latest technologies.” Stephen adds, “Secure data portals are very important in our work. The web offers a fantastic way for us to make data available, but our data is so complex and comes from such a rich variety of sources that we need to ensure we are working with the latest standards in the most appropriate way.”

Over the last two years, Tessella has assisted Stephen, Matt and others in the RAL Space Science and Technology Department to achieve this goal. Matt says, “We had worked with Tessella in the past, and knew that they had a good reputation for



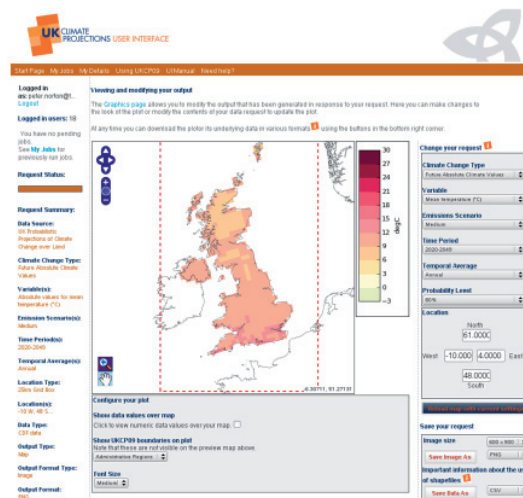
understanding scientific data. Our work has peaks and troughs in resourcing, and Tessella has proved invaluable in being able to provide staff quickly as we need them, and then ramp down at quieter times.” Stephen goes on, “The formats and standards we use are well known in the atmospheric science community, but not necessarily widely used elsewhere. By working with Tessella, we have found a supplier who not only understands our software needs, but also very quickly gets their heads around the wider scientific needs of our work.”

The NERC Data Grid

Matt continues, “A great example of that was the NERC Data Grid project. This was a six-year project, completed in 2009, and was a collaboration between several of NERC’s data centres. The idea was to build components of an extensible, federated data infrastructure that would deliver a variety of data-related services to NERC’s scientists, as well as the wider international community. Tessella were instrumental in upgrading many aspects of the data grid.”

“Specifically, they introduced a new, much simplified version of the metadata schema, and largely rewrote the pipeline for handling metadata. Removing redundancies and streamlining this pipeline, including improvements to the data storage efficiency, gave us improvements in data access times by factors of up to a thousand – making the resulting search facilities far more responsive.”

Stephen adds, “I have been working with Tessella on a project called the QUEST Earth System Data Initiative. This will provide a portal on to multidisciplinary research data – the ultimate aim of the QUEST project is to bring together UK scientists to answer policy questions on the global environment. Tessella has given us great assistance in developing the web services aspects of this work, building on the framework that we have developed here whilst providing much appreciated software engineering expertise.”



UK Climate Projections interface – developed with help from Tessella

Other Experience

More widely, Tessella has a broad range of skills applicable to the environmental sector, including groundwater modelling, risk and hazard analysis software, waste management systems and support for nuclear material asset management.

Visit www.tessella.com for more information.

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