

NEODC Annual Report 2007/2008

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Introduction

The role of the NEODC is, in line with NERC Data Policy, to ensure the responsible stewardship and distribution Earth Observation (EO) data acquired and generated by NERC, to give guidance on the availability and use of EO data and to coordinate the acquisition of new data resources. NEODC work therefore consists primarily of data management activities, data acquisition and user support.

The following metrics give some indication of NEODC usage:

- 171 identifiable users downloaded 54.7TB of data in 1.1 million files over this period.
- 194 users have registered this year bringing the total to 668. The number of users registered for one or more datasets or services is 248.
- Approximately 322 queries were answered this year.

NEODC Management

The Centre for Environmental Data Archiving (CEDA) led by Bryan Lawrence (BNL) hosts both the British Atmospheric Data Centre (BADC) and the NERC Earth Observation Data Centre (NEODC). This year has shown further progress in implementing an organisational structure which enables more efficient sharing of data centre infrastructure. The Open Archive Information Systems reference model (an ISO standard for archives) has been used to ensure best practice in this context.

Key personnel in NEODC are Victoria Jay (VLJ), Matt Pritchard (MJP) and Steve Donegan (SJD).

Developments

Website

The NEODC website has continued to be updated throughout the year, with news items and updates to fact sheets. The NEODC received a total of 83,937 separate visits to its website from remote users during the period 01/04/2007 – 31/03/2008, comprising a total of 396,832 individual HTTP requests (excluding internal usage).

User Support

Delivery of data to customers has continued to grow, with 22 datasets now available via NEODC. Approximately 322 user enquiries were logged this year, compared to 245 in 06/07. The number of registered users also increased significantly (from 474 to 668), as did the number of users downloading data (166 this year, compared to 152 in the previous year). A breakdown of download statistics by period and dataset is shown in Appendix 1.

Dataset catalogue

Work has continued to populate the CEDA catalogue, based on the NERC DataGrid "MOLES" (Metadata Objects for Links in Environmental Sciences) metadata model. Information has now been entered about all NEODC datasets and related entities (e.g. data production tools, satellite missions etc)

Progress on Datasets

- **ARSF:**
 - VLJ visited ARSF Kidlington in April and further useful discussions were held with

staff from ARSF Kidlington, ARSF-DAN (ARSF Data Analysis Node, Plymouth) and CEH Monks Wood at the ARSF workshop in Newcastle in September. Issues such as missing data, gaps in documentation, inconsistent file formats were addressed, as well as plans for future data deliveries.

- ARSF-DAN have sent a trial delivery of some 2007 data to NEODC for feedback on directory structure and documentation and complete deliveries of 2006 and 2007 flight data are expected soon.
- Records of all ARSF deployments (approx 530 deployments, 1982-present) have been entered into the MOLES metadata catalogue (including project / site / PI details) which can be searched and discovered via the NERC DataGrid.
- Polygons describing the locations of all ARSF project sites (approx. 600) have been created and added to the metadata catalogue which allows projects and associated data to be found using the interactive map search.
- **ARSF Aerial photography:** The project funded by the NERC Data Management Coordination budget to digitise the archive of ARSF aerial photography was completed by the end of July. The scanned photos are available on-line alongside other ARSF data. A metadata catalogue is being produced, enabling the photo locations and preview images to be visible via the NEODC map search.
- **NCAVEO field experiment:** NEODC is distributing data from the NCAVEO (Network for Cal/Val of EO data) field experiment in June: aircraft, satellite and ground observations continue to be added to the archive. Work is underway to ensure datasets are complete, in suitable formats and properly documented to allow long-term preservation. When complete, the dataset will be a valuable resource for investigation of cal/val issues.
- **MTCI:** MERIS Terrestrial Chlorophyll Index products produced by Infoterra are hosted at and distributed by NEODC. In response to BADC and NEODC user demand NEODC commissioned Infoterra to process the data to fill the gaps in the dataset (end 2002, 2005 and early 2006). Recent data continued to be added to the archive until end 2007, but due to lack of funding no new MERIS Level 3 MTCI data have been produced by Infoterra after this date. The MTCI dataset at NEODC now covers 2002-2007 and is available to registered users.
- **ESA (A)SAR:** : A first batch of (A)SAR products supplied by NOC, Southampton have been ingested and metadata have been extracted. A web page and access conditions have been set up and the data are now available to registered users via the on-line archive. Work is in progress to enable the data locations to appear on the interactive map search. A second batch of data have been delivered and will be ingested and made available soon.
- **ESA Envisat:** MIPAS, SCIAMACHY and MERIS data continue to be added to the NEODC archive (arriving via DDS and ftp). Gaps in the MERIS and SCIAMACHY archive (2004/2005) due to hardware failures at BADC/NEODC have been filled via tape and ftp from ESA.
- **(A)ATSR:** The (A)ATSR common-format archive has continued to grow at NEODC, with regular deliveries of AATSR data from ESA (normally within 3 months of acquisition), and processing to Envisat-format of ATSR-1 and ATSR-2 data. Data products covering the 16-year, 3 mission period continue to prove popular with NEODC users, with approx 1 Terabyte of (A)ATSR data downloaded per month. NEODC is currently trialling the "MERC1" web interface (from Brockmann Consult) which enables spatio-temporal selection and child product extraction.

NCEO

NEODC and Reading e-Science Centre jointly submitted the NCEO Informatics Theme bid as part of the NCEO proposal to NERC in May 2007. Initial visits were carried out to some of the NCEO Science Themes and meetings were held with Gary Robinson and Jon Blower from ReSC. Responses were prepared to the referees' comments and the moderating panel's report.

A new specification was issued for NEODC's role in the NCEO in February 2008. A new proposal was written and submitted on 25th February addressing the requirements for NEODC to a) Provide

dedicated data management services in support of the NCEO and its science themes; and b) Provide earth observation data management services in support of the wider environmental science community.

Collaborations and Co-funded activities

The NEODC has a number of co-funded activities and collaborations. Active and funded projects in 2007-2008 include:

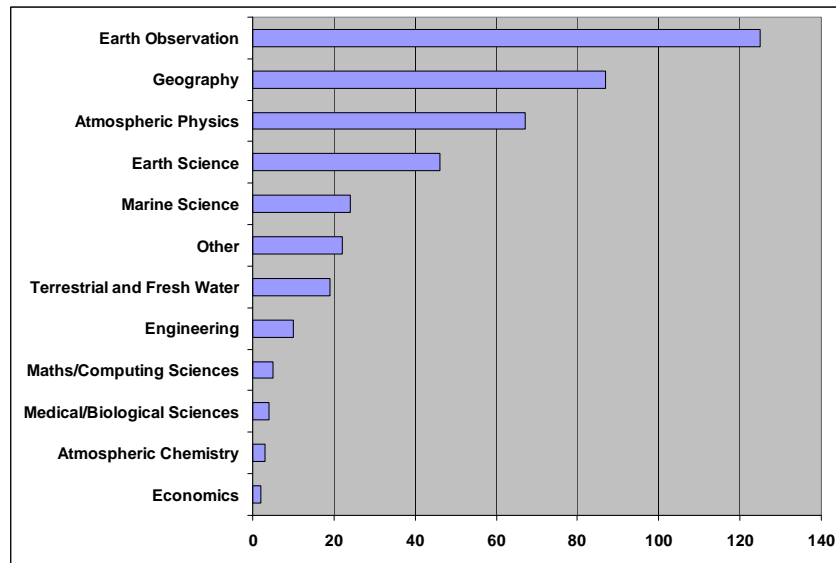
- *(A)RC – (A)ATSR Reanalysis for Climate* is a major Knowledge Transfer project funded by NERC, Defra and the MOD. (A)RC is led by University of Edinburgh and includes the Met Office, University of Leicester, RAL and NOCS. The project started in 2006 and will continue until 2010. NEODC's role is to facilitate processing and archive and disseminate the project's output data.
- *(A)ATSR Archive*
 - The £480k Defra/SpaceConneXions project to create a common-format archive of (A)ATSR data products started in 2005 and was completed this year. A proposal for a joint (A)ATSR Operations & Archive follow-on contract was successfully submitted to DEFRA, with the aim of continuing operations and archive support at RAL for the next 2 years.
 - A new project is underway, implementing a processor to enable (A)ATSR archive products to be converted into GHRSSST L2P data products with addition of error information and ancillary fields. This work is being carried out under joint UKMO/ESA funding in collaboration with Leicester University.
- *Multimission Vicarious Calibration of Spaceborne Optical Instruments*: ESA project to create a dataset of cal/val products from the (A)ATSR Archive, started 2007.
- *ESA SSE Project*: An ESA project was funded (£44k) to create additional web services using the ESA SSE (Service Support Environment). Three NEODC services have been developed, 2 relating to producing derivative products from (A)ATSR, and a further service aimed at enabling SSE users to discover resources made available by the NERC DataGrid.
- *NERC DataGrid*: Some of MJP's effort this year was funded by the NERC DataGrid project, integrating components such as the Discovery web service into the NERC Data Discovery Service.

Other collaborative activities during 07/08 include:

- *JISC Geospatial Data Working Group*: Matt Pritchard (MJP) attended meetings as NERC's representative on the JISC Geospatial Data Working Group
- *NCAVEO*: Victoria Jay (VLJ) continued as a member of the NCAVEO steering committee
- *Dundee back-up*: NEODC continues to operate a secure back-up for AVHRR and SeaWiFS data at NEODAAS Dundee.
- *BIGF*: NEODC now holds a backup of British Isles GPS Archive Facility data in the firesafe
- *ARSF*: VLJ has taken over MJP's position on the ARSF Steering Committee. New instruments are now operating on board the aircraft (Eagle, Hawk) and additional instruments will be commissioned next year (LiDAR and atmospheric instruments). The new data will require additional effort and storage capacity at NEODC, as data volumes increase and new data streams need to be set up and documented.
- *NERC EO Services and Facilities*: VLJ attended a meeting with Alan O'Neill (Director, NCEO) and representatives from the NERC EO Services and Facilities (ARSF, NEODAAS, SGF, FSF, BIGF, MSF, MSTRF, CFARR), to exchange information about current activities and future plans. NEODC and BADC already have involvement with data management for some, but not all, of the relevant S&F.

Knowledge Exchange

Figure 1: Active NEODC users in 2007/08, by discipline



The NEODC provides data to an entire community of EO data consumers, not just EO scientists. Of the users who registered and accessed data in the year 2007/2008 (see Figure 1), several users are not from NERC disciplines (10 from engineering, 4 from medical and biological sciences). Approximately 70% of users were not primarily Earth Observation scientists, although it is likely that a number of the scientists in other environmental sciences could also be classed as “EO”: users select their own discipline at the time of registration with NEODC.

As well as direct communication of data, many of the projects with which NEODC is involved have knowledge exchange as a fundamental outcome:

- (A)RC is a Knowledge Transfer project to generate a climate quality SST dataset for users at the Hadley Centre and wider.
- NCAVEO is a NERC Knowledge Transfer Network to support the calibration and validation of Earth observation data.
- ESA SSE development will provide services for users in the community to access and manipulate NEODC datasets.
- The MTCI dataset, a consolidated regional Terrestrial Chlorophyll Index produced as a Level 3 product by Infoterra Ltd with ESA funding, is publicised and made available for the research community by the NEODC.

Outreach

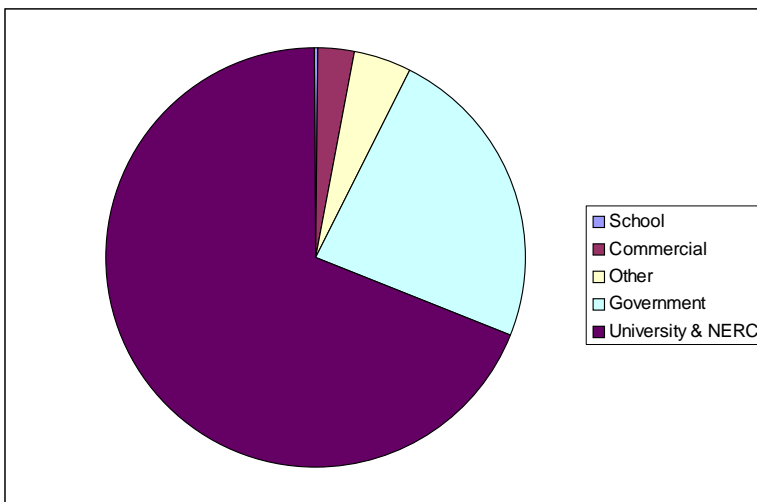
The following activities in public engagement, outreach and publicity were carried out this year. In addition, NEODC has a significant web presence, and many users of the NEODC are not from the academic community at all (approximately one third in 2007/2008 – Figure 2).

- VLJ attended the Chilbolton Observatory open day on 16th April 2007 and manned the exhibit on Earth Observation and (A)ATSR
- MJP attended the ENVISAT symposium, Montreux in April 2007 and gave a joint presentation with ESA to launch the (A)ATSR Archive, currently at version 1.1
- NEODC and BADC staff supervised a work experience student (21-25 May 2007)
- MJP attended the NERC/BARSC Knowledge Transfer workshop on 3rd June 2007 and gave a presentation about Knowledge Transfer activities at the NEODC
- VLJ gave a Careers Talk (through Women in Science and Technology) to 100 school girls at St Swithun’s School, Reading, focussing on Earth Observation (18 July 2007)
- VLJ gave a presentation on the datasets available through NEODC, and the (A)ATSR archive in particular, at the “Sensing and Mapping the Marine Environment” Symposium ,

organised by the Remote Sensing and Photogrammetry Society (RSPSoc) and Challenger Society for Marine Science (CSMS) jointly affiliated ocean colour SIG (16 July 2007)

- VLJ gave a presentation, on the ARSF data archive and ARSF web service, at the ARSF workshop in Newcastle (11 September 2007)
- VLJ attended the RSPSOC 2007 Conference in Newcastle (September 12-14) , gave a presentation on NEODC data and services, and manned a publicity stand with two NEODC posters in collaboration with ARSF and FSF
- VLJ, MJP and SJD attended the NERC Data Management Workshop in Leamington Spa (10/11 Oct 2007), gave presentations and several posters about NEODC datasets and activities
- January 2008: NEODC (MJP/SJD) and Dave Smith (AATSR Cal/Val Scientist) organised and hosted a 3-day training course for users of the BEAM software for use with (A)ATSR and MERIS products, demonstrating the Java API and processing framework capabilities. The course was taught by staff from Brockmann Consult and attended by MJP, SJD and 2 other RAL staff, along with 4 members of NEODC's (A)ATSR user community from UCL, University of Swansea and University of Leicester. Very positive feedback from users was received

Figure 2: Active users in 2007/2008 by institute.



Appendix 1: Access statistics for NEODC

Table 1 : Time breakdown

Period	Users	Datasets	Number (k)	Size (GB)
2007Q2	66	18	183	3356
2007Q3	76	14	307	4434
2007Q4	79	17	139	2061
2008Q1	75	15	291	3861

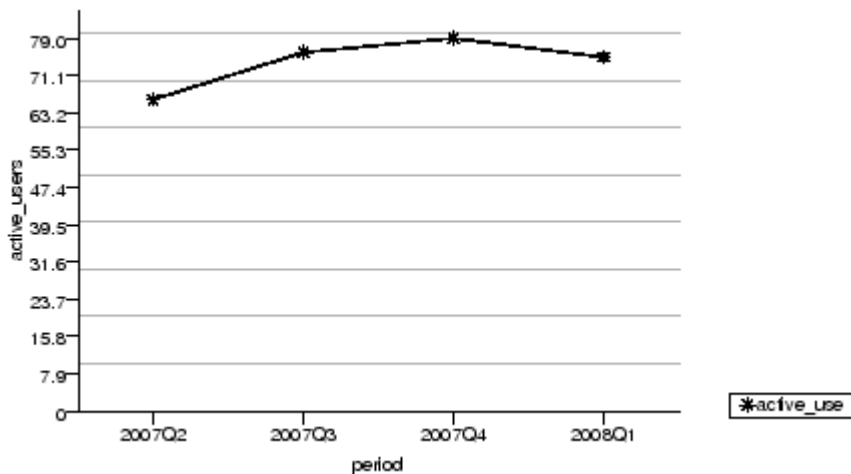


Table 2 : Most popular datasets

Dataset	Users	Number	Size (MB)
NEXTMap	42	403066	632094
AATSR multimission	32	125795	8986602
ARSF	28	778	22957
Scanned Aerial photographs	26	629	7410
SCIAMACHY	19	2724	862403
MERIS	16	73	0
NCAVEO field experiment	14	3122	160016
MIPAS	14	6614	1329222
Landsat7 ETM	13	160	6312
MTCI	8	557	33098
AVHRR_FASIR	7	50	99
SHAC2000	6	10811	105281
NCAVEO LCM2000	4	238	35
ATSR UBT	4	333003	1858300

Appendix 2: List of Acronyms

(A)ATSR	(Advanced) Along-track Scanning Radiometer
ARSF	Airborne Research and Survey Facility
ARSF-DAN	ARSF - Data Analysis Node
BADC	British Atmospheric Data Centre
CEDA	Centre for Environmental Data Archival
MOLES	Metadata Objects for Links in Environmental Sciences
MTCI	MERIS Terrestrial Chlorophyll Index
NCEO	National Centre for Earth Observation
NEODC	NERC Earth Observation Data Centre
NCAVEO	Network for Calibration and Validation of EO data
STFC	Science and Technology Facilities Council