



SERVICES & FACILITIES ANNUAL REPORT - FY April 2001 to March 2002

 NERC EARTH OBSERVATION DATA CENTRE (NEODC)	 NATURAL ENVIRONMENT RESEARCH COUNCIL	FUNDING Block	AGREEMENT SLA	ESTABLISHED as S&F ~1985	TERM 5 years
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Type of Service Provided

NERC has acquired - in support of alpha grade science during the preceding 30 years - a vast quantity of remotely sensed data of the surface of the Earth obtained by commercial satellites and its own aircraft. This valuable resource - estimated present value in excess of £7M – has fortunately been retained and now provides a unique record of environmental conditions during the previous 3 decades. It comprises digital data which in most cases have been rigorously calibrated and geo-corrected and scientists are therefore able to use such data with confidence in support of research and survey to understand and predict the natural environment and as a valuable input to long-term environmental monitoring.

The NERC Earth Observation Data Centre is one of six NERC Designated Data Centres. The NEODC Mission - in line with the NERC Data Policy - is to ensure the responsible stewardship and distribution of its own Earth Observation (EO) data, to give guidance on the availability and use of this and other EO data, and to routinely acquire additions to the data holding; all such data services to be carried out in an efficient and cost-effective manner in response to requests from accredited customers. The NEODC also monitors the stewardship accorded to other Earth observation data acquired by NERC so that such data are managed as a valuable resource for present and future environmental science. The NEODC is also increasingly acting as a single portal regarding Earth Observation data and information supporting environmental research - both in the UK and worldwide.

The revised summary statement of the NEODC Mission is as follows:-

" To achieve the objective that the NERC Earth Observation Data Centre (NEODC) shall deliver effective and efficient services to the NERC community in locating, accessing, applying and interpreting Earth Observation data and associated EO information, and shall also ensure the long-term integrity of EO data produced and acquired by NERC projects and programmes".

In order to achieve its mission the NERC Earth Observation Data Centre :-

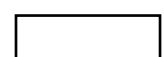
- maintains a central archive and catalogue of NERC commercial satellite data and NERC airborne remotely sensed data - accessible through the NEODC website: www.neodc.rl.ac.uk
- provides access to this data for NERC Centres and Surveys, the UK HEI community, NERC Thematic Programmes and NERC-funded academics and other groups in accordance with the terms of the NERC Data Policy
- co-ordinates and supervises the archiving of all digital data and ancillary information relating to the annual flying campaigns of the NERC Airborne Remote Sensing Facility
- enhances the information and metadata content of its web pages
- continues to ensure the professional curation, and ease of access for registered customers, of all EO data acquired by NERC by the addition of such data previously held at the Centres & Surveys onto the NEODC archive
- acts as a contact and liaison point for communications on other national and international archiving/cataloguing initiatives relating to EO data
- provides advice on availability and copyright regulations pertaining to commercial satellite data
- provides policy and strategy input to NERC corporate data policy through the NERC Data Advisory Group.

SCORES AT LAST REVIEW (each out of 5)				Date of Last Review: January 1999	
Need	Uniqueness	Quality of Service	Quality of Science & Training	Average	
5.0	4.0	4.0	4.0	4.25	

CAPACITY of HOST ENTITY FUNDED by S&F	Staff & Status			Next Review (January) 2004	Contract Ends (31 March) 2005
	100%	Dr Stuart White	Established - 50% of time		
	Dr Matt Pritchard	Fixed-term - 100% of time			
	Bernard Cooper	Fixed-term - 80% of time for this FY			

FINANCIAL DETAILS: CURRENT FY											
Recurrent Allocation £k	Unit Cost £k *								Capital Expend £k	Income £k	Full cash cost £k
	Unit1	Unit2	Unit3	Unit4	Unit5	Unit6	Unit7	Unit8			
133.1	3.258	3.927	1.920	2.589	4.596	3.927	0.582	1.251	Nil	Nil	135.1
FINANCIAL COMMITMENT (by year until end of current agreement)											
2002-03	£105.6k ?	2003-04		2004-05		2004-06		2006-07			

* PTO



Unit 1: Commercial Satellite Data Programme Request; Unit 2: Commercial Satellite Data Archive;
 Unit 3: NEODC Satellite Data Archive; Unit 4: NEODC Airborne Data Archive; Unit 5: NEODC Aerial Photo Archive
 Unit 6: Commercial Aerial Photo Archive; Unit 7: General Data Enquiry; Unit 8: Unsuccessful Data Search.

STEERING COMMITTEE	Independent Members	Meetings per annum	Other S&F Overseen
ARSFSC	7	2	ARSF
DSRSSC	5	1-2	DSRS

APPLICATIONS: DISTRIBUTION OF GRADES (Current FY - 2001/02) NB: All NEODC Datasets – obtained since 1972 - have been acquired in support of high α grade science funded by NERC.							
	$\alpha 5$	$\alpha 4$	$\alpha 3$	$\alpha 2$	$\alpha 1$		
NERC Grant projects	1	3					
Other academic							
Students		15 Studentships	were supported				
Pilot							
TOTAL							
APPLICATIONS: DISTRIBUTION OF GRADES (per annum average previous 3 years — 1998/1999 1999/2000 & 2000/2001)							
	$\alpha 5$	$\alpha 4$	$\alpha 3$	$\alpha 2$	$\alpha 1$		
NERC Grant projects	1.5	7					
Other Academic							
Students		13 Studentships	were supported				
Pilot							
TOTAL							

USER PROFILE (current FY)						<i>*Combined non-Thematic and Thematic</i>				
Grand Total	Infrastructure					PAYG				
	Supplement to NERC Grant *	Student Total	NERC	NERC C/S	Other	NERC Grant*	Student Total	NERC	NERC C/S	Other
46	19	14	14	1	26					
USER PROFILE (per annum average previous 3 years)						<i>*Combined non-Thematic and Thematic</i>				
Grand Total	Infrastructure					PAYG				
	Supplement to NERC Grant *	Student Total	NERC	NERC C/S	Other	NERC Grant*	Student Total	NERC	NERC C/S	Other
56	19	12	12	4	31					

USER PROFILE (current FY)				
Academic	Centre/Survey	NERC Fellows	PhD	Commercial
41	1		11	0
USER PROFILE (per annum average previous 3 years)				
Academic	Centre/Survey	NERC Fellows	PhD	Commercial
44	4		9	2

OUTPUT & PERFORMANCE MEASURES (current FY)										
Publications (by science area & type) – Data not collected by NERC Designated Data Centres										
SBA	ES	MS	AS	TFS	EO	Polar	Grand Total	Refereed	Non-Ref/ Conf Proc	PhD Theses
Distribution of Projects (by science areas)										
SBA	ES	MS	AS	TFS	EO	Polar				
4	11	4	1	26	23	0				
OUTPUT & PERFORMANCE MEASURES (per annum average previous 3 years)										
Publications (by science area & type) – Data not collected by NERC Designated Data Centres										
SBA	ES	MS	AS	TFS	EO	Polar	Grand Total	Refereed	Non-Ref/ Conf Proc	PhD Theses
Distribution of Projects (by science areas)										
SBA	ES	MS	AS	TFS	EO	Polar				
6	16	8	1	39	19	2				

OVERVIEW & ACTIVITIES IN FINANCIAL YEAR (2001/02):

Customer Data and Information Services

Throughout the year the NEODC has continued to provide a cost-effective and efficient service for the search, purchase, archiving and delivery of commercial satellite data on behalf of the NERC-funded community. A search and delivery service has been provided for all satellite and airborne data requests which can be sourced from the NEODC archives. Many associated enquiries relating to Earth Observation data resources, applications information, and copyright regulations and means of access have been received at the Data Centre and these have also been dealt with in a timely manner with appropriate advice and information provided.

A summary tabulation of customer data enquiries received by the NEODC is provided in Annex 5 to this report - these communications requested archival searches and/or delivery of Earth observation scenes - either satellite or airborne data. Following confirmation of image specifications and data pricing, the supplier delivery time for new satellite data rarely exceeded 15 working days, except where data were sourced from non-European ground stations. Response time targets for both commercial archive data provision - two weeks - and the delivery of NEODC archive digital data - 1-2 days - have been maintained for all data deliveries, except for one Ikonos data delivery from Space Imaging Europe.

No significant data quality problems were recorded during the year and no formal/informal complaints regarding the quality and delivery of the NEODC services during 2001/02 have been received. In fact, there have often been comments complimenting the NEODC on the quality and timeliness of its data and information services.

Meetings/Correspondence have been activated with two of the new EO Centres of Excellence (COMET and CTCD) concerning appropriate data management principles and plans for the projected requirements of EO data procurement and curation for these two centres.

Archive

Significant effort has been deployed to continue the transfer of dataset holdings of Earth Observation data - mostly satellite data - from NERC Centres and Surveys onto the NEODC archive - to ensure the security of preservation and increased visibility/accessibility of these data to the academic community. This has been particularly timely where data has been held on old CCTs - in many cases the magnetic tapes were deteriorating and the tape transcription hardware was vitally obsolete.

During 2001/02, data has been transferred from BGS Keyworth, SOC Southampton, CEH Monks Wood and CEH Wallingford with 98.3% successful transcription of these datasets. The NEODC has also taken delivery of the NERC/BNSC SHAC2000 airborne data comprising hyper-spectral visible and synthetic-aperture radar data of various project locations around the UK.

As a result of these additions, the volume of data held on the NEODC archive has almost doubled in 2001/02 to approaching 0.5 Terrabytes.

Website

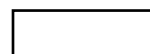
A completely new, and vastly improved, website for the NEODC - www.neodc.rl.ac.uk - was launched in late March 2002 and is designed to act as a one-stop portal for Earth Observation data and information. The new website has also been designed to enhance its attractiveness to both regular academic customers and other visitors and has been constructed to ultimately allow efficient search and access to Earth Observation information as well as data - whether held at the NEODC or at other data centres. The website includes enhanced graphics with a hierarchical menu section for both the airborne and satellite data, a simplified search interface to the existing NEODC metadata catalogue, graphical tools for selection of geographical areas, and detailed information pages describing each type of data held by the NEODC. It is planned to continually update and augment the website information pages which it is intended will incorporate news items, discussion forums and a word-searchable, comprehensive series of information pages covering all aspects of Earth Observation in support of the environmental sciences.

Strategic Papers/Presentations

A Poster describing the work of the NEODC and its services to the academic community was prepared and will be presented at the 5th International Airborne Remote Sensing Conference in Miami in May 2002.

With the projected transfer of the NEODC into the Earth Observation programme within the NERC, the opportunity was taken to give a presentation on the present work and forward strategy for the NEODC to some members of the Earth Observation Expert Group (EOEG) in August 2001.

An **NEODC Implementation Plan** - comprising a 3-year Business Plan for the Facility - was prepared and submitted to the EOEG in February 2002. The Implementation Plan comprised a forward look for the NEODC for 2002/3-2004/5 incorporating a summary plan, detailed work packages for the Facility and finance/resource spreadsheets for both the individual work packages and for the overall programme on an annual basis. This Plan also included the proposal that the NEODC should adopt responsibility for the ATSR-1/2 data archive and the future provision of data services with respect to this very important archive. The EOEG has approved and authorised the NEODC Implementation Plan for the next



three years.

SCIENCE SUPPORTED IN FY (2001/02):

Remotely-sensed digital and analogue imagery of the surface of the Earth – terrestrial and aquatic – are used extensively in support of research and survey across the full spectrum of NERC's environmental sciences and the NEODC data resources make a major contribution to all five of the NERC Environmental and Natural Resource Issues (ENRIs):

ENRIs	Bio-diversity	Environmental Risk	Global Warming	Natural Resource Management	Pollution & Waste	Other
No. of Projects	7	14	5	28	5	11

In previous years the NEODC has provided data services in support of this research to many UK University departments carrying out investigations into the natural environment. These include:- Geology, Geography, Biological Sciences, Earth Sciences, Soil Science, Ice and Climate, Archaeology, Planning and Landscape, Environmental Sciences, Remote Sensing, Marine Science and Coastal Management, Oceanography, Civil Engineering, Zoology, Hydrogeology, Epidemiology and Public Health, Land Use, Glaciology, Built Environment and Engineering Geology.

Likewise, within the NERC Centres and Surveys, there is wide application of Earth observation data and users of NEODC services during the period of the present SLA include most of the component Centres and Surveys.

New and archive satellite and airborne data were delivered to 19 NERC award holders – 4 of these were projects relating to Research Grant awards and 15 comprised Studentships. The titles of some of these high α -grade projects are listed below and demonstrate the breadth of NERC science for which the NEODC data and information services provided a valuable input:

“Geomatics for the Detection, Prediction, Monitoring and Understanding of Geohazards”

“Ground Deformation at Active Volcanos and its Relation to Magma Migration and Degassing”

“Assessing the Vulnerability of Aquifer Overlain by Glacial Drift using Modern Glacial Analogues and Geophysics”

“Mapping Abandoned Shorelines of Tibetan Lakes to Measure Holocene Distortion of the Surface”

“Evaluation of Satellite Imagery in the Archaeological Assessment of Arid Zone Environments”

“The Ecology and Genetics of Mauritian Skinks Earmarked for Use in Habitat Reconstruction”

“Monitoring Forest Cover and Wetland Sedimentation in Cat Tien National Park, Viet Nam”

“The Late Cenozoic Development of the Gediz River, Turkey”

“Sea-Level Implications of Svalbard Glacier Volume Changes through Interferometry and Digital Photogrammetry”

“The Temporal and Spatial Distribution of Active Deformation in the Basin and Range”

“The Impact of Environmental Change on Steepland River Systems, Crete”

“Source Mechanisms of Shallow Earthquakes in the Alpine-Himalayan Belt from INSAR and Waveform Modelling”

“Monitoring the Annual Dynamics of Wetlands and Land Cover in Vietnam using Space-based Radar Remote Sensing”

“Using Urban Aquifers: Sustainability under Different Time and Space Scales”

“Reconstructing Quaternary Glacial Environments for the Teifi Estuary and Cardiganshire Coast”

“Individual Dispersal Decisions and Emergent Metapopulation Dynamics of an Endemic Afro-Tropical Mammal – the Angolan Black-and-White Colobus Monkey”

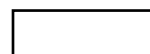
FUTURE DEVELOPMENTS/STRATEGIC FORWARD LOOK

At the end of this reporting period, the NEODC officially transfers from the Services & Facilities portfolio to the Earth Observation programme within NERC.

In readiness for this transfer, and as a response to an Expert Group study into the EO Data Requirements for NERC Science, the NEODC management prepared an Implementation Plan for the NEODC which addressed a significant number of these defined requirements. The Plan focuses particularly on those requirements concerned with the management of existing and projected future archive datasets and their associated metadata, and making these data and other Earth Observation information readily and efficiently available to the environmental sciences community. The resulting document effectively represents a detailed business plan for the NEODC in its "new" role.

This 3-year Business Plan (2002/03 - 2004/05) - see Annex 4 - comprises a series of work packages - covering its service and infrastructure - defining projects which the NEODC will need to carry out in support of NERC's remit to understand and predict the environment. Amongst these work packages the following examples were identified as being of higher priority:-

- NEODC Website Development
- Operation of the ATSR-1/2 Archive and Services
- Expanded EO Information Content for the NEODC Website



- | |
|--|
| <ul style="list-style-type: none">• Development of an Enhanced Metadata Catalogue System• Review of NERC Data Stewardship |
|--|

NATURAL ENVIRONMENT RESEARCH COUNCIL (NERC)

THE NERC EARTH OBSERVATION DATA CENTRE

MISSION STATEMENT

" To achieve the objective that the NERC Earth Observation Data Centre (NEODC) shall deliver effective and efficient services to the NERC community in locating, accessing, applying and interpreting Earth Observation data and associated EO information, and shall also ensure the long-term integrity of EO data produced and acquired by NERC projects and programmes"

The NERC Earth Observation Data Centre (NEODC) is responsible for the stewardship of NERC's airborne remotely-sensed data and of satellite data acquired by NERC from commercial sources. Such data will be acquired cost effectively, held securely and distributed in an efficient manner in response to customer requests.

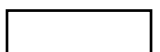
The Data Centre will also ensure that adequate professional and effective stewardship is accorded, as appropriate, to other Earth observation (EO) data acquired by NERC, so that such data are managed as a valuable resource for the environmental research and survey community.

The Data Centre will act as a central portal regarding Earth Observation data and information generally and will also provide advice and guidance, as appropriate, on matters of copyright, policy and strategy with regard to NERC EO data resources.

In order to achieve its mission the NERC Earth Observation Data Centre will:

- *Provide and maintain an up-to-date website - NEODC@rl.ac.uk - which will act as a one-stop central portal for Earth Observation data and information services*
- *maintain a central archive and catalogue of NERC-acquired commercial EO satellite data and airborne remotely sensed EO data searchable through this website*
- *provide access to the above data for NERC centres and surveys, NERC thematic programmes, NERC-funded academics and other accredited customers, in accordance with the terms of the NERC Data Policy*
- *co-ordinate and supervise the archiving and dissemination of all digital data and ancillary information relating to the flying campaigns of the NERC Airborne Remote Sensing Facility*
- *provide advice on availability and copyright regulations pertaining to commercial satellite data*
- *act as a contact and liaison point for communications on other national and international data archiving/cataloguing initiatives*
- *provide policy and strategy input to NERC corporate data policy*

The NEODC exists to provide Earth Observation data and information services primarily to the environmental research and survey community in support of NERC's mission to understand and predict the environment. Data may also be supplied to other accredited users as defined within the NERC Data Policy.



NERC AIRBORNE REMOTE SENSING FACILITY STEERING COMMITTEE

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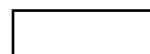
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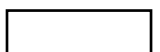
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NERC AIRBORNE REMOTE SENSING FACILITY (ARSFSC)

REMIT AND TERMS OF REFERENCE

Remit:

The NERC Airborne Remote Sensing Facility Steering Committee exists to:

- review applications for use of the Airborne Remote Sensing Facility
- monitor outputs from the Airborne Remote Sensing Facility
- provide advice to Director Science Programmes on aspects of operations of the Airborne Remote Sensing Facility

Director Science Programmes, in turn, provides advice to the Science and Technology Board of Council on Services and Facilities relevant to its remit. The Airborne Remote Sensing Facility is relevant to the Board's remit.

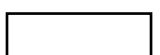
Terms of Reference:

1. To review applications and establish priorities, for the Manager of the Facility, for the allocation of those of the Facility's resources funded from the NERC budget, taking into account recommendations made through the NERC peer review mechanism.
2. To monitor the scientific quality of work undertaken by users utilising the Facility based on reports and publications.
3. To monitor the level of user satisfaction with the service and to analyse the user base.
4. To give guidance to the Manager of the Facility on improvement of the Facility's equipment and on its service function.
5. To advise Director Science Programmes on:
 - a. the level and direction of the internal R&D programme for the Facility
 - b. anticipated changes in requirements from the Facility and the anticipated levels of future demand for the Facility.
6. To receive annually a report from:
 - a. the Manager of the Facility and to comment thereon as appropriate prior to submission of the report to the Director Science Programmes
 - b. the NERC Earth Observation Data Centre and to comment thereon as appropriate prior to submission of the report to the Director Science Programmes
 - c. the Remote Sensing Data Analysis Service and to comment thereon as appropriate prior to submission of the report to Director Science Programmes.
7. To provide advice to Director Science Programmes at other times as appropriate.

Membership Constraints:

Membership of the Committee will be decided by the Director Science Programmes with advice from the Science and Technology Board and suggestions from the Committee itself. It will include the Manager of the Facility and a representative from the Science Programmes Directorate.

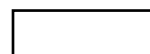
Members, other than ex-officio members, will be invited to serve for a term of up to four years with a maximum extension of a further two years. The Chairman will serve a maximum of four years.



NERC EARTH OBSERVATION DATA CENTRE (NEODC)

EQUIPMENT INVENTORY - APRIL 2002

	Purchased	Approx. Purchase Price.
Workstations:		
DEC Alpha workstation	1998	£3000
Sun-Solaris workstation	1994	£5000
Disk Drives:		
StorageWorks 18.2 GB SCSI disk (For Alpha Server 1200)	1998	£1000
Transtec 3000 75 GB	2001	£1000
PCs (including monitors):		
Elonex Prosentia 4000 RAM 512 P4. (With CD-writer)	2001	£2000
Pericom 333 96 RAM Pentium 2 (With CD-writer)	1998	£2000
Pericom 450 256 RAM Pentium 2 (With CD-writer)	1998	£1500
Pericom 233 64 RAM Pentium 2	1995	£1300
Printers:		
HP deskjet1120C	1999	£200
Epson Colour 850	2000	£150
Other:		
Mini Ethernet Transceiver	1998	£200



NERC EARTH OBSERVATION DATA CENTRE (NEODC)

FUTURE DEVELOPMENTS:

**NERC EARTH OBSERVATION DATA CENTRE (NEODC)
IMPLEMENTATION PLAN - Financial Years: 2002/3-2004/5.**

Executive Summary:

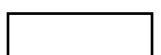
The Implementation Plan summarises the 3-year Business Plan (2002/3-2004/5) for the NEODC so as to meet the objectives of the new NEODC Mission Statement:

To achieve the objective that the NERC Earth Observation Data Centre (NEODC) shall deliver effective and efficient services to the NERC community in locating, accessing, applying and interpreting Earth Observation data and associated EO information, and shall also ensure the long-term integrity of EO data produced and acquired by NERC projects and programmes.

The Implementation Plan comprises - in the following order:-

- A summary of the proposed work programme which explains the overall strategy for the various work packages which have been defined as necessary for the delivery of these targets. This includes a schematic presentation of the work packages comprising the Implementation Plan - the ATSR-1/2 work package is included as a dashed box to indicate that it's inclusion is subject to approval.
- A series of detailed individual work packages which will provide the basis of monitoring the progress of each project.
- Three Spreadsheets:
 1. Individual Work Packages: Staff Resource Requirements and Recurrent Costs per Annum
 2. ATSR-1/2 Archive Programme: Resource Requirements
 3. Overall Work Packages: Costs per Annum

For the first two years of the Plan the total cost of the programme closely matches the projected income for each year. For the 3rd and final year of the Plan it has been necessary to cut the staff resource to meet the projected available income which is some £50k less than for the previous two years. This fall in income arises because a projected underspend of £106k has been brought forward from 2001/2 and spread over the first two years of the programme.



NEODC Implementation Plan - Financial Years: 2002/3-2004/5

Introduction:

The EOEG Strategic Working Group on Earth Observation (EO) Data, chaired by Professor Barry Wyatt, produced a comprehensive report entitled "Principles and Recommendations to be Applied to EO Data for the NERC Scientific Community".

A further report was produced by this Strategic Working Group which proposed a series of actions to implement the recommendations of the first report, namely 'Next Steps towards Implementation of the Report on the Principles ...'. They noted that "The NERC Earth Observation Data Centre (NEODC) has a vital role to play in the realisation of many of the objectives of the Wyatt reports and the following Implementation Plan for the NEODC addresses these issues and the way forward to meet many of these targets. The achievement of these objectives will undoubtedly provide a real benefit to the efficient and effective use of Earth Observation data in support of environmental research and survey thereby contributing to NERC's remit to understand and predict the environment".

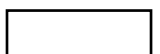
A formal 'requirements' document for the NEODC was then developed by a subset of EOEG, led by Dr. Lesley Gray, in August 2001.

The purpose of the Implementation Plan is to provide the details of specific activities that will be required to fulfil the requirements that were identified. The aim is for it to become a working document for the NEODC, with work packages enhanced and new packages identified and added as the project progresses.

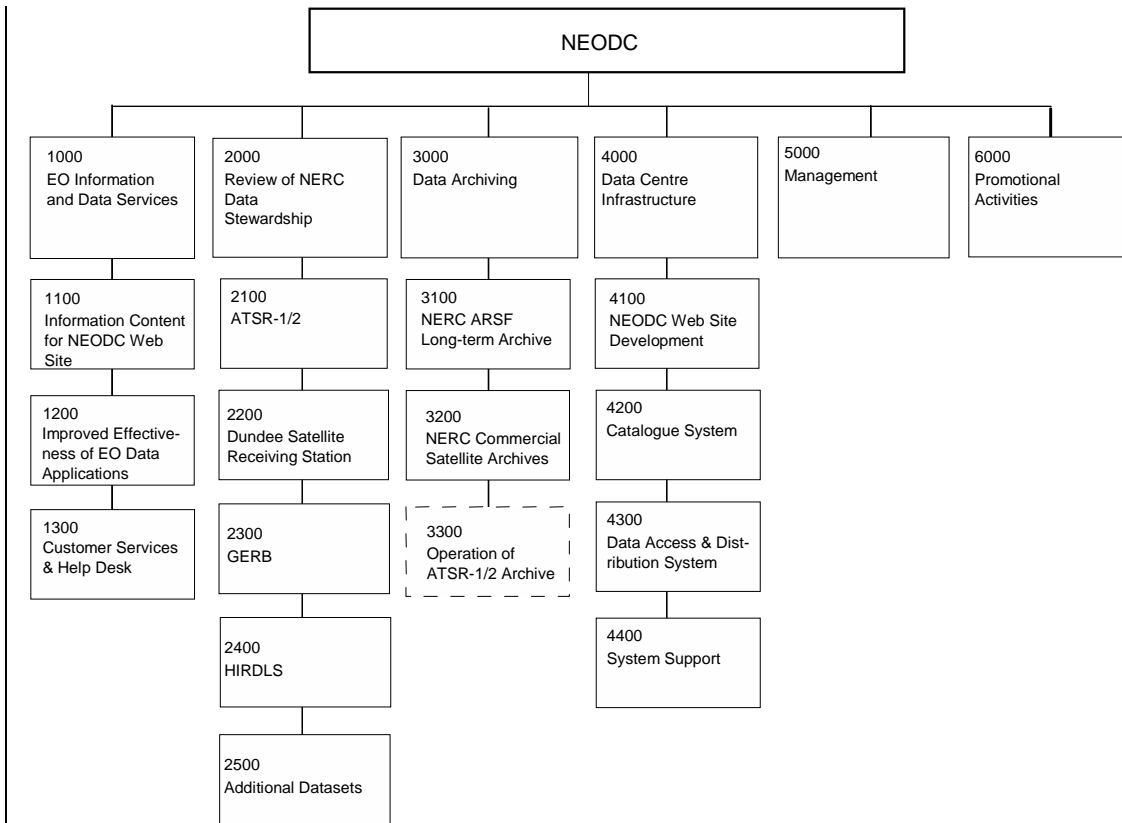
The following Implementation Plan comprises a Schematic Overview of the structure and summary content of each of the work packages presently proposed for the Implementation Plan followed by a summary of the strategic objectives of the various work packages. The specific Work Package documents are then presented and these will be used to monitor progress on the various work packages which may be amended in the future in the light of changing requirements. It should be noted that a Work Package for the Operation of the ATSR-1/2 Archive has been provisionally included within the proposed work packages for Data Archiving - this is subject, of course, to the approval of the EOEG.

Finally three spreadsheets showing the work package resource requirements for the 2002/3-2004/5 period is presented which detail the per annum staff resource/costs, recurrent costs and capital costs, and the projected NEODC income per annum for the period. For the 1st and 3rd spreadsheets, this resource/cost information for the Implementation Plan is presented for two scenarios:-

- 1) excluding operation of the ATSR-1/2 archive - first figure in each column, and
- 2) including operation of the ATSR-1/2 archive - second figure in each column (in brackets).



Schematic Overview of NEODC Workpackages



Work Packages

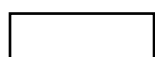
WP1000: EO Information and Data Services

The existing NEODC largely concentrates on data from the NERC ARSF and complementary high-resolution satellite data (e.g. LANDSAT, SPOT etc) and offers a bespoke data service to all NERC scientific disciplines but to a fairly small section of the overall NERC research community. The purpose of this work package is to build and develop the existing NEODC to widen the range of EO data and services that can be accessed through the NEODC infrastructure so it can serve the broader range of EO data needs of the NERC science community.

Work undertaken in this package will provide a web-based service that will act as a gateway for a broad range of NERC users who wish to make use of EO data sets in their research, or who are trying find out whether EO data is useful and available for their research. The planned web-based service will offer users a single and comprehensive point of entry to the “world of EO data” and other EO resources available on the web. Also, in addition, it will provide contact details for EO data and services that are only available off-line.

As well as providing access links to EO data, another key component of the NEODC operation will be a series of web-based “discussion forums” to ensure that information about EO data sets and their usage is actively disseminated to the NERC community. This work package will provide for the development, implementation, and operation of these “news group” services.

Note: NEODC will work with other existing NERC Designated Data Centres to minimise duplication of effort and maximise the inter-operability, where appropriate.



WP1100: Information Content for NEODC Web Site

The NEODC WWW service will be revised to enable it to successfully perform the role of “first point of entry” www service for users who require information on EO matters in support of their research and/or survey objectives. There will be comprehensive coverage of information on the sensors and platforms, calibration data and characteristics, supporting technology and the application of EO data to research and survey in the natural environment. Direct access to selected important international and national sites will be available from the top-level page (e.g. NERC, BNSC, Environment Agency, ESA, NASA, EUMETSAT, NASDA etc). A further tool will enable searches of a comprehensive list of thousands of useful WWW addresses related to EO. Selected missions e.g. ENVISAT will be ‘highlighted’ with the provision of a set of information pages describing the instruments, data availability etc plus pointers to further WWW information and documentation. News groups, ‘frequently asked questions’ and ‘self-help’ fora will all be employed to help the user find the information and/or data required.

WP1200: Improved Effectiveness of EO Data Applications

The new NEODC service will provide improved customer support service in order to help its users to understand both how to make use of EO data resources and how these may be applied to solving NERC environmental and natural resource issues. Some help and information pages are already posted on the NEODC website but there is a clear need to widen and enhance this valuable service to the research and survey community. It will provide guidance to NERC programmes and projects on all data issues, including formats, data storage issues and standard data processing software tools. It will work with the community to stimulate and, where appropriate, develop value-added data and tools as required. In application areas where NEODC does not have resident expertise, it will provide assistance in locating the relevant expertise.

WP1300: Customer Services and Help Desk

The NEODC will continue to provide the data services that it has effectively provided previously but there will be a significant enhancement in the provision of information on data availability through appropriate web links which will also allow access to information relating to EO data and its application to environmental sciences.

For data provision by the NEODC, customers will be required to register and then, subject to appropriate accreditation, their data requests will be met by the delivery of data sets on requested media or by ftp mechanisms.

The NEODC will establish a "Help Desk" to deal with all customer enquiries which require more than the routine processing of data requests so that users will be able to seek expert advice to assist them in meeting their needs in the context of Earth observation data and information.

WP2000: Review of NERC Data Stewardship

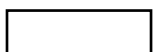
Through the auspices of its various projects and programmes, NERC has been acquiring and collating Earth observation data for more than 30 years. These data have been collected and used in support of NERC environmental science and have then been stored to different standards, with varying degrees of metadata, and on different media, at various locations.

The status of these data holdings will be established and an assessment of demand will be carried out so that informed judgements can be made by the Steering Committee about whether such archives should be preserved in the UK or not. This will include an assessment of actions that would be required to preserve the data and to distribute it in a useful and timely fashion.

Where demand is already established and the data are already held in secure archives e.g. many of the data sets at the Dundee Satellite Receiving Station (DSRS), the NEODC will continue to work with those Data Centres to ensure that the curation of such data is carried out in a professional and secure manner. Where appropriate, standard data and metadata formats and cataloguing procedures will be recommended and actively encouraged.

WP2100: ATSR-1/2

The ATSR Post Launch Support (PLS) Programme is approaching the end of its term and there is need to consider the long-term archiving strategy for the considerable ATSR-1/2 data archive which is presently managed by the PLS Programme. It is considered important that these significant data sets are retained for use by the scientific



community and that adequate provision is made to ensure this valuable resource can continue to be exploited by future programmes of research.

With the input of information and advice from the ATSR Steering Committee, EOEG and other interested parties, together with cost and scientific usage information, a report including recommendations can be submitted to the EOEG on the future policy for the ATSR-1/2 archives.

WP 2200: Dundee Satellite Receiving Station

WP 2300: GERB

WP 2400: HIRDLS

WP 2500: Additional Datasets

These work packages will be produced as a result of the proposed Review of NERC Data Stewardship and recommendations from the Steering Committee and the EOEG.

WP3000: Data Archiving

It is anticipated that much of the data accessed through NEODC will actually be held elsewhere in discipline specific data centres like BADC, but that NEODC will hold data of a multi-disciplinary nature. However, there will nevertheless be a requirement for some data sets to be held at NEODC. These include:-

- 1) data sets that are currently held by NEODC,
- 2) expensive satellite data purchased by NERC (e.g. LANDSAT, SPOT, etc.) that can be used more cost effectively by more users if distributed centrally,
- 3) data actually produced by NERC instruments (e.g. ARSF, ATSR-1/2, ISAMS, HIRDLS, SHAC etc), or through NERC-funded activities, where the NEODC is deemed to be the most appropriate DDC to provide the long-term archive for the community, and
- 4) other 3rd party data sets which are in frequent use by the NERC EO community that could be used more effectively if held within a local archive at the NEODC.

WP3100: NERC ARSF Long Term Archive

WP3200: NERC Commercial Satellite Archives

WP3300: Operation of ATSR-1/2 Archive

WP4000: Data Centre Infrastructure

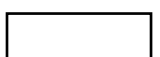
Data centre infrastructure is required in order to maintain and develop the internet presence of the NEODC, and to archive and distribute the data held by NEODC (currently digital imagery acquired by commercial satellites and by the NERC Airborne Remote Sensing Facility). This includes adequate hardware systems, database and cataloguing procedures, distribution mechanisms, user support systems etc. Wherever possible this will be done in synergy with the BADC, using identical software and systems and the development of a strategy for hardware purchasing (e.g. of data storage systems) in order to maximize efficiency and cost-effectiveness.

WP4100: NEODC Web Site Development

Work has already begun on radically re-styling the NEODC website, to reflect its broader role as a portal for EO information, as well as improving access to an expanding range of datasets. Features such as the EO news service, self-help discussion fora and searchable links collections rely on software to allow the web server to interact with a database, both of which need to be maintained and updated where necessary, and the scripts that connect them improved according to feedback from users and inputs from other sources.

WP4200: Catalogue System

The development of a new, comprehensive metadata catalogue and search system is underway, and will provide customers with access to consistent and high-quality metadata for items held by the NEODC. Rigorous cataloguing is also crucial to the efficient management of data resources within the NEODC. XML (eXtensible Markup Language) metadata records will be automatically created for both present and future data items, using the widely-used FGDC Content Standard for Geospatial Metadata. These will contain detailed information about each data item,



such as image corner coordinates, height and other parameters. A dedicated metadata server, coupled with an enhanced search interface, will make use of these detailed catalogue entries to provide a powerful tool for searching not only the local holdings of the NEODC, but also those of other data providers such as other NERC Data Centres. Conversely, the NEODC's metadata records will be "visible" when searching other metadata gateways such as the NERC metadata gateway. Such interoperability will be a major boost to effective use of Earth Observation data and information resources worldwide by the NERC community and others.

WP4300: Data Access & Distribution System

Access to the data held by the NEODC will be provided via an automated system, whereby customers can extract data from the archive over the internet in near-real-time and download the required files. It is anticipated that the software developed and currently used by the BADC will be adapted for use with the NEODC archive and integrated into the NEODC website. A useful by-product of such a system is to provide detailed usage statistics of items are supplied from the archive.

WP4400: System Support

Support and maintenance of NEODC system hardware and software, including upgrades and backup.

WP5000: Management

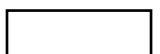
There are clear advantages to be derived by the exploitation of collaborative ventures with other UK and, perhaps subsequently, international centres that have significant holdings of EO data - both satellite and airborne. This will considerably widen the scope and content of available EO data resources available to NERC community.

The NEODC has already commenced co-operative ventures with a number of NERC Centres & Surveys. A large quantity of satellite and airborne EO data sets previously held at NERC Centres & Surveys has now been transcribed onto the NEODC archive and it is expected to continue this process over the coming year. A similar exercise has also commenced with regard to University departments known to be holding EO data sets and this will be expanded to include new NERC Earth Observation Centres. However there are also a considerable number of opportunities such as with the Environment Agency and increased involvement with the e-science / data grid activities in the UK and Europe.

WP6000: Promotional Activities

The NEODC will undertake an active programme of promotional activities to ensure the maximum awareness and utilisation of the NEODC services.

The NEODC is planning to launch its improved website in the near future which will incorporate many enhancements to the present web pages; further improvements will continue thereafter, particularly with regard to information links and help pages. The NEODC is also presently in the process of designing a publicity leaflet. Feedback from users will be actively sought so that the NEODC services can be improved and enhanced to meet the requirements of its customers. NEODC staff will also actively promote the NEODC through the preparation and presentation of material for relevant conferences, workshops and meetings.



Spreadsheets

Spreadsheet 1: Work Packages Resource Requirements for 3-Year Period 2002/3-2004/5

In each column of the spreadsheet the first figure represents the staff resource or recurrent cost required for the NEODC to carry out its implementation plan excluding any involvement in the ATSR-1/2 archive and data service provision. The second figure in each column - in brackets - includes adjustments to accommodate the ATSR-1/2 archive project.

This spreadsheet shows the staff resource (staff months) and recurrent costs per annum required to execute the work packages within the projected annual income for the 3-year Implementation Plan for the NEODC. For the first two years the staff resource and recurrent costs are considered to be realistic to carry out the proposed work. However, in the third year, cuts have been made in the staff resource in order to match the projected income. Please note that the allocation of zero staff resources for WR1200 in 2004/5 is a result of this required cut, and not because the work package, per se, has been completed.

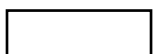
Spreadsheet 2: ATSR-1/2 Archive Programme - Resource Requirements

This spreadsheet shows the initial set-up cost to interface the ATSR-1/2 data to the NEODC, and the ongoing costs hardware maintenance, system and user support.

Spreadsheet 3: Work Packages - Costs per Annum

This spreadsheet presents the annual total costs for staff resource, recurrent, and capital expenditure for the overall work packages WR1000 - WP6000. As for Spreadsheet 1, the first figure in each column represents the cost of the Plan excluding the ATSR-1/2 archive project and the second figure in each column - in brackets - is the cost with the ATSR-1/2 project included.

The overall Total Cost for the Implementation Plan - for both scenarios (exclusion and inclusion of the ATSR-1/2 project) closely match the projected Total Income for the Plan over the 3-year term. This has been achieved, however, by significant cuts in the staff resources for some of the work packages in the 3rd year as explained above.



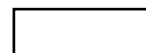
NEODC IMPLEMENTATION PLAN 2002/3 - 2004/5

Spreadsheet 1:

WORK PACKAGES: STAFF RESOURCE REQUIREMENTS AND RECURRENT COSTS PER ANNUM FOR 3-YEAR PERIOD 2002/3-2004/5

Package No.	Name	Staff Months						Recurrent	
		2002/3		2003/4		2004/5		per annum	
WP1000	EO Information and Data Services	8.5	(7.5)	12.5	(11.5)	14.5	(10.0)	£3,000	(£3,000)
WP1100	Information Content for NEODC Web Site	3.0	(2.5)	2.5	(2.0)	2.5	(2.0)	£1,000	(£1,000)
WP1200	Improved Effectiveness of EO Data Applications	1.5	(0.0)	4.0	(1.5)	4.0	(0.0)	£1,000	(£1,000)
WP1300	Customer Services & Help Desk	4.0	(5.0)	6.0	(8.0)	8.0	(8.0)	£1,000	(£1,000)
WP2000	Review of NERC Data Stewardship	3.0	(3.0)	1.0	(1.0)	1.0	(1.0)	£1,000	(£1,000)
WP2100	ATSR-1/2	0.5	(0.5)						
WP2200	Dundee Satellite Receiving Station	0.5	(0.5)						
WP2300	GERB	1.0	(1.0)						
WP2400	HIRDLS	1.0	(1.0)						
WP2500	Additional Datasets			1.0	(1.0)	1.0	(1.0)		
WP3000	Data Archiving	6.5	(7.5)	5.5	(5.0)	4.5	(3.5)	£2,000	(£9,500)
WP3100	NERC ARSF Long-term Archive	2.5	(1.5)	3.5	(2.0)	3.0	(1.0)	£1,000	(£1,000)
WP3200	NERC Commercial Satellite Archives	4.0	(3.0)	2.0	(1.5)	1.5	(1.0)	£1,000	(£1,000)
WP3300	ATSR-1/2 Archive		(3.0)		(1.5)		(1.5)		(£7,500)
WP4000	Data Centre Infrastructure	10.0	(10.0)	8.0	(9.5)	6.5	(5.5)	£7,600	(£7,600)
WP4100	NEODC Web Site Development	4.5	(4.5)	4.0	(4.0)	3.0	(1.5)	£2,000	(£2,000)
WP4200	Catalogue System	3.0	(3.0)	2.5	(2.5)	2.0	(1.5)	£1,000	(£1,000)
WP4300	Data Access & Distribution System	2.0	(2.0)	1.0	(1.0)	1.0	(0.5)	£1,000	(£1,000)
WP4400	System Support	0.5	(0.5)	0.5	(2.0)	0.5	(2.0)	£3,600	(£3,600)
WP5000	Management	1.0	(1.0)	1.0	(1.0)	1.0	(1.0)	£500	(£500)
WP6000	Promotional Activities	1.0	(1.0)	2.0	(2.0)	1.0	(1.0)	£1,000	(£1,000)
Total		30	(30.0)	30	(30.0)	28.5	(22.0)	£15,100	(£22,600)

- N.B.
1. WP3300: Recurrent for ATSR-1/2 archive (£7,500) is only in 2003/4 and 2004/5 - see Spreadsheet 3.
 2. WP6000: Recurrent £1,000 and (£1,000) have been averaged over 3 years 2002/3-2004/5 - actual cost profile per annum is shown in Spreadsheet 3.



NEODC IMPLEMENTATION PLAN 2002/3 - 2004/5

Spreadsheet 2:

ATSR-1/2 ARCHIVE PROGRAMME - RESOURCE REQUIREMENTS

	2002/3	2003/4	2004/5
Hardware Capital	£15k		
Hardware Maintenance		£7.5k	£7.5k
Archive Implementation	3months		
System Support		1.5months	1.5months
User Support	1months	2months	2months
Total Cost	£35k	£25k	£25k

N.B. Total Cost assumes SLA staff cost of £60k per annum (not inflated)

The Resource Requirements comprise:-

In 2002/3:

One-off cost to interface and establish the archive of £15k for hardware and 3 staff months effort. Additionally 1 staff month is required for the provision of a user support/help desk.

In 2003/4 and 2004/5:

Hardware maintenance costs of £7.5k made up £6k for hardware maintenance/replacement and £1.5k for replacement tapes/consumables. The staff resource constitutes 1.5 staff months of system support together with an increase from the first year to 2 staff months for user support which assumes the continuation of current levels of ATSR data use.



NEODC IMPLEMENTATION PLAN 2002/3 - 2004/5

Spreadsheet 3:

WORK PACKAGES: COSTS PER ANNUM £K

Figures in (brackets) are adjusted to include ATSR-1/2 work

		2002/3		2003/4		2004/5		3-Year Total	
WP1000	Staff	42.5	(37.5)	62.5	(57.5)	75.0	(60.0)		
WWW+User Support	Recurrent	3.0	(3.0)	3.0	(3.0)	3.0	(3.0)	189.0	(164.0)
WP2000	Staff	15.0	(15.0)	5.0	(5.0)	5.0	(5.0)		
Data Stewardship	Recurrent	1.0	(1.0)	1.0	(1.0)	1.0	(1.0)	28.0	(28.0)
WP3000	Staff	32.5	(37.5)	27.5	(25.0)	22.5	(7.5)		
Data Archives	Recurrent	1.0	(1.0)	1.0	(1.0)	1.0	(1.0)		
	Commercial Satellite Data Purchase	11.0	(11.0)	11.0	(11.0)	11.0	(11.0)		
	ATSR-1/2 Hardware Maintenance				(7.5)		(7.5)		
	ATSR-1/2 Capital Purchase		(15.0)					118.5	(136.0)
WP4000	Staff	50.0	(50.0)	40.0	(47.5)	32.5	(32.5)		
System Development+ Support	Recurrent	3.6	(3.6)	3.6	(3.6)	3.6	(3.6)		
	Capital	3.0	(3.0)	10.5	(10.5)	3.0	(3.0)	149.8	(157.3)
WP5000	Staff	5.0	(5.0)	5.0	(5.0)	5.0	(5.0)		
Management	Recurrent	0.5	(0.5)	0.5	(0.5)	0.5	(0.5)	16.5	(16.5)
WP6000	Staff	5.0	(5.0)	10.0	(10.0)	5.0	(5.0)		
Promotion	Recurrent	0.5	(0.5)	1.5	(2.0)	1.0	(0.5)	23.0	(23.0)
Total Cost		173.6	(188.6)	182.1	(190.1)	169.1	(146.1)	524.8	(524.8)
Total Income		189.8		193.6		141.2		524.6	

N.B.

1. Total Income for the first two years is derived from SLA income for 2001/2 (£103.1k) plus 1/2 SJW cost from NERC (£30k) and inclusion of underspend from previous years: £106k which is spread over the first two years (£53k per annum) to enable the Plan to be implemented. An inflation factor of 2% per annum has been applied.
2. Total Income in 2004/5 is derived from SLA income and 1/2 SJW cost from NERC. It assumes £30k income for S White for 6 manmonths is continued - N.B. SJW ret at end of 2003/4.
3. The Total Cost for the 3-year term of the Plan closely matches the projected Total Income. This has been achieved by cuts in staff resources in the 3rd year.
4. Costs for staff have not been inflated.

