

#### National Earth Observation Group

#### NBAR

#### Project Approach

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Project Definition

## Objective

The key objectives of this project include:

* to deliver an NBAR capability that can be run in a fully automated environment for images that have been acquired during the ‘MODIS era’ (post April 2000).
* codes that will be ‘stand alone’ , compatible with but not dependent upon existing data processing systems.
* the ability to run on a system that is not coupled to the existing processing system such as the NCI infrastructure or an ISB-based Linux environment.

## Scope

### Included

The following items are included in the scope of this project:

* The scientific code and scripts associated with automation of ancillary parameter extraction
* The Algorithm Theoretical Basis Document
* Supporting business process documentation
* Scientific code Integration into operational system

### Excluded

The following items are excluded from the scope of this project:

* R&D associated with NBAR processing to cover the pre-MODIS era
* R&D associated with terrain correction
* Land cover based BRDF parameters method

## Dependencies

The following dependencies are evident on this project:

* Creation of a metadata record for NBAR processed output is required from the Business Development team; and
* Support from the Operations team relating to ensuring the developed system can function in an operations business process.

## Project Approach

### Summary

A review of literature was undertaken by Fuqin to identify ‘best practice’ methods for removing view angle, solar angle, and atmospheric effects from moderate resolution satellite imagery (NBAR correction for the purposes of this document). The accuracy of the NBAR correction process was validated by data collected through field work and the overall approach was submitted for international peer review through publication as a scientific journal paper. This project is designed to take the correction methodology developed by Fuqin and move it from a labour intensive scene-by-scene approach into a ‘lights out’ operational environment capable of processing hundreds of scenes with minimal user input. A two-staged approach to process over 200 NBAR corrected images will be tested through this project to demonstrate operational capability. The Project Manager will schedule fortnightly meetings to brief the Project Executive on project progress against deliverables.

### Deliverables

|  |  |  |  |
| --- | --- | --- | --- |
| **Product ID** | **Product Name** | **Description** | **Owner(s)** |
|  |  |
| 1 | The scientific code and scripts associated with automation of ancillary parameter extraction | The functioning solution (software code) that delivers six NBAR corrected reflectance bands | Fuqin Li and Lan Wei Wang |
| 2 | The Algorithm Theoretical Basis Document (ATBD) | Details the science underpinning the NBAR processing methodology | Fuqin Li |
| 3 | Supporting business process documentation | Details the business flows to support the smooth transfer of NBAR process to a production environment | Medhavy Thankappan, Lan–Wei Wang and resource from Operations |
| 4 | Integration testing with development systems completed | Check that system works as designed, QA checks on outputs | Lan-Wei Wang and Fuqin Li |
| 5 | Specification of infrastructure and software license requirements for operationalisation | Ensure requirements for operationalisation are articulated | Lan-Wei Wang, Fuqin Li and resource from Operations |
| 6 | Metadata for NBAR processing (dependency on external project) | Additional metadata required to describe the NBAR correction process for ingest into EODS | Business Development resource for generating metadata |
| 7 | Integration testing with production systems completed | Check that systems works as designed, QA checks on outputs | Lan-Wei Wang and resource from Operations |
| 8 | Formal hand over of process to the Operations team | Formal hand over process for operational implementation | Medhavy Thankappan and Wenjun Wu |

**Table 1 – List of products required to deliver operational NBAR**

### Schedule

The schedule for delivering the above products is identified in the below table.

| **Product ID** | **Product Name** | **Predecessor** | **Delivery Date** |
| --- | --- | --- | --- |
| 1 | The scientific code and scripts associated with automation of ancillary parameter extraction |  | 12.02.10 |
| 2 | The Algorithm Theoretical Basis Document |  | 26.03.10 |
| 3 | Supporting business process documentation |  | 23.03.10 |
| 4 | Integration testing with development systems completed | 1 | 24.02.10 |
| 5 | Specification for infrastructure and license requirements for operational implementation | 1,3 | 26.02.10 |
| 6 | Metadata record for NBAR processing |  | 19.02.10 (Dependency on Bus Dev) |
| 7 | Integration testing with production systems completed |  | 30.03.10 |
| 8 | Hand over of process to the Operations team | 3,7 | 15.04.10 |

Note: if you want to handover of the process to operational team by April 15, it can not guarantee whether aerosol database is built.

**Table 2 – Product delivery schedule**

## Project Team

The organisation structure shown in Figure 1.

**Project Executive**

Adam Lewis

**Project Manager**

Medhavy Thankappan

**Science**

Fuqin Li

Leo Lymburner

**Business Development**

Lan-Wei Wang and additional resource

**Operations Team** Additional resource

**Senior Supplier**

Medhavy Thankappan

Wenjun Wu/Luci night

**Senior User**

Stuart Barr

**Figure 1 – Project organisation chart**

Initial Risk Analysis

| **ID** | **Risk title** | **Description** | **Impact** | **Mitigation** | **RAG** |
| --- | --- | --- | --- | --- | --- |
| 1 | Staff availability | Staff may be tied to other NEO projects and not available to work on this project. | The project schedule may slip and the project may not deliver the required outcomes. | Avoid - A prioritisation by the Project Executive to decide projects of highest priority for the nominated staff.  Accept - Any time spent by the Lan-Wei and Operations team additional resource should be tracked separately to account for any time delays for this project. | **A** |
| 2 | Aerosol optical data | Appropriate sources of aerosol optical data may not be available at all locations/times | Reduced accuracy of NBAR correction | Avoid - Source additional aerosol optical data sets from CSIRO  Accept - Provide error measures for images processed using different AOD inputs. This may also include the use of other aerosol assessment techniques | **G** |
| 3 | EODS upload test | Tests re: EODS input will rely on a functional upload mechanism (Dependency on external project) | Unable to complete task 6 (metadata record for NBAR processing) | Avoid - EODS function as specified | **A** |
| 4 | Product may not suit operations team requirements for production system | Operations team may have specific requirements around the ‘operationalising’ of the NBAR production process | There may be process or system rework required for the capability | Avoid – Ensure formal engagement with key operations staff | **A** |

**Table 3 – Initial Risk Log**

Document Administration

## Document Location

The Master copy of this document is held at the following location: TRIM: 2009/4427 D2010-16918

## Revision History

|  |  |  |  |
| --- | --- | --- | --- |
| Revision Date | Version No. | Description | Changes Marked? |
| 4.2.2010 | 0.1 | Initial Draft | No |
| 5.2.2010 | 0.2 | Edits to initial draft made by Medhavy | Yes |
| 11.2.2010 | 0.3 | Edits made by Daniel Swift | Yes |
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## Distribution

This document has been distributed to:

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| Organisation and Title | Date of Issue | Copies |
| Adam Lewis (Group Leader) | 8.2.2010 |  |
| Medhavy Thankappan (Project Leader) | 8.2.2010 |  |
| Wenjun Wu (Project Leader) | 8.2.2010 |  |
| Luci Knight (A/g PL) | 8.2.2010 |  |
| Stuart Barr (Project Leader) | 8.2.2010 |  |
| Lan-Wei Wang | 8.2.2010 |  |
| Fuqin Li | 8.2.2010 |  |
| Leo Lymburner | 8.2.2010 |  |