Systems Engineering

User Requirements for a Platform to Support Meta-Data Driven Interoperability

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Document	Date Issued	Authors	Notes
G308.4.3.1 Systems Engineering Function.doc	10-03-2008	W Hugo	Draft
G308.4.1.1 Governance Framework.ppt	10-03-2008	W Hugo	Draft
G294.2.1.2 URS Portal Integration.doc	26-11-2007	W Hugo	SAEON Portal
G294.2.1.3 CoGIS Audit Report.doc	28-11-2007	W Hugo	SAEON Portal
G294..2.1.3 URSMappingClients.doc	26-11-2007	W Hugo	SAEON Portal
G320.1.3.1.3 SAEON Guidelines for User Requirements Specification	15-10-2008	W Hugo	SAEON Portal

Version Control

Version	Date Issued	Authors	Description of Major Changes
G320.1.3.1.1	11-09-2009	W Hugo, S Olivier	Draft for internal use and subcontracting
G320.1.3.1.2	14-10-2009	W Hugo et. al.	Amendments relating to SRS, Mapping Interface
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Sign-Off

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Intellectual Property and Copyright

Contents

Introduction

SAEON (The South African Environmental Observation Network) has been contracted to provide the platform for SAEOS and to maintain and support the platform until March 2012. This is a beneficial arrangement for all stakeholders, for a number of reasons. Chief amongst these are

- the shared benefits of collaborative development (most infrastructure of the kind required by SAEOS exist already or is also required by parallel ventures, and are often funded by the same sponsors),
- and the reduced risk of sporadic development, the fact that support resources are often difficult to come by, and other sustainability issues that arise with a less collaborative approach.

SAEOS benefits from the fact that shared development programmes are already under way for SAEON itself, for the South African Risk and Vulnerability Atlas (R&VA), and other developments.

This document is a platform User Requirements Statement, on an abstract but relatively technical level, with extensions pertinent to the SAEOS platform included.

In addition, it details only extensions to the CoGIS portal required to extend it for general platform use, and to support the Risk and Vulnerability Atlas in particular. The current CoGIS functionality is detailed in two previous User Requirements Documents.

SAEOS will only be a success if two main objectives can be met:

1. Provision of a technology platform that is sustainable, aligned with international standards, and useful for its intended purpose;
2. Agreement with and operationalization of data and service sources within the stakeholder community in South Africa, thereby building a common resource of use to the local and international community.

The process that is envisaged for the establishment of the technology platform needs to meet several secondary objectives, amongst these are the possibility of contributing directly to the GEOSS registry of components, standards, and services, and to participate in the GEOSS working groups.

Known omissions:

1. Typical use cases need to be confirmed and documented.
2. Site layout and design must be completed with user input.

Section 1: Conceptual Architecture and Design Directives

Conceptual Architecture

This document deals first and foremost with the high-level requirements placed on a shared platform for the provision of meta-data driven, interoperable systems for data management. The platform needs to make provision for

- the support of a variety of data formats and data sources,
- a wide variety of stakeholder requirements and domains,
- and different levels of data use: from basic data provision and preservation to value addition and decision support.

The need for such a platform is evident in the parallel and sometimes overlapping requirements expressed for different initiatives in the earth and environmental observation domains. Many of these initiatives are directly or indirectly funded by the South African government, often through DST and the NRF – and as such, a single shared platform initiative is required to support at least the following:

- SAEON and the execution of its mandate;
- SAEOS (The South African Earth Observation Strategy) portal;
- The Risk and Vulnerability Atlas (R&VA);
- The World Data Centre for Biodiversity and Human Health (WDC-BHH);
- A range of other initiatives[1].

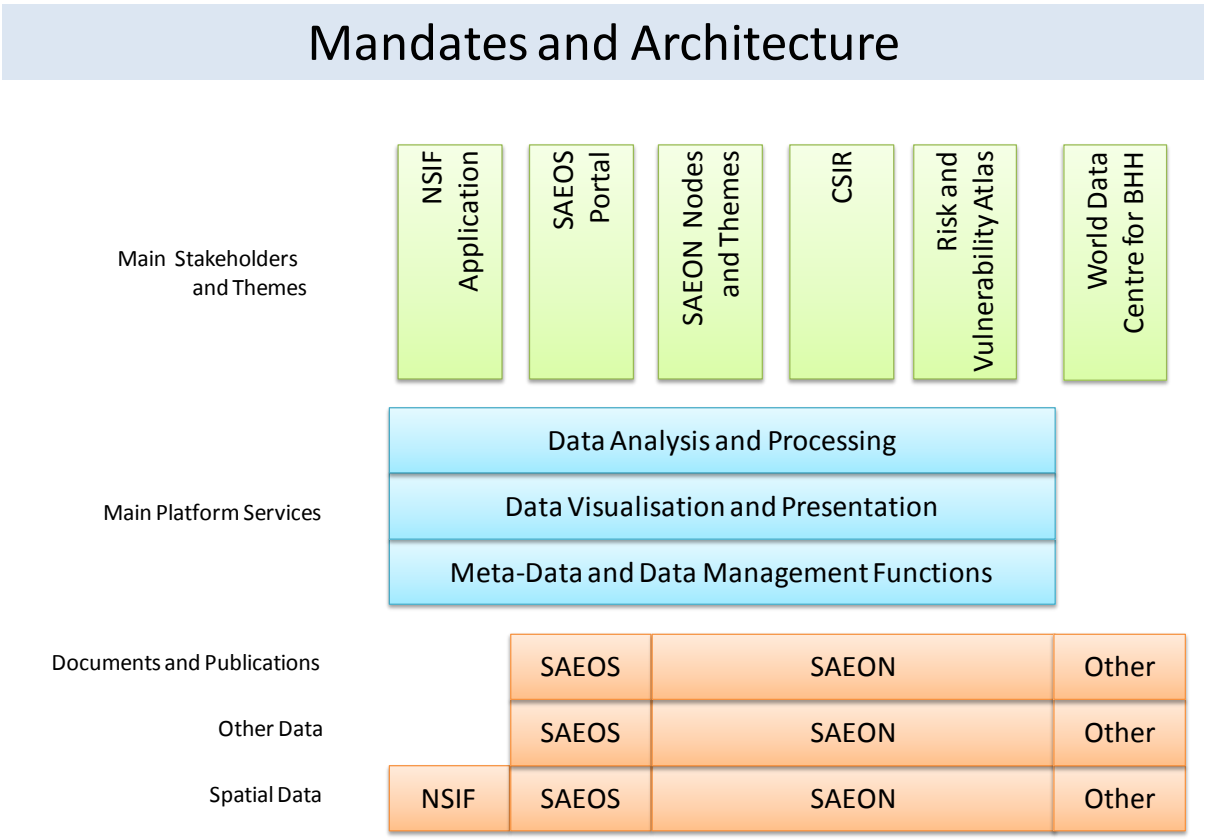
Each of these initiatives has unique requirements, but in broad terms, the initiatives all share a basic requirement for meta-data and data management that is addressed in this document. It also shares requirements for data processing, presentation, and visualisation that can be shared.

Furthermore, many of the meta-data repositories that these initiatives need access to (whether these are dynamically searched on demand or whether the meta-data repositories are replicated centrally) are the same. For example, repositories on biodiversity are required by SAEOS, SAEON, R&VA, WDC-BHH, and several others. There is no need to duplicate the functionality and effort required to expose and integrate these repositories into portal environments where they can be better utilised.

Finally, several of the typical platform tools that are required to establish a domain or community-specific view on the meta-data and data repositories can be shared. These include the establishment and management of user communities and control to access and visibility of portal resources, collaboration environments, facilities for monitoring of portal resource usage and value, collaboration support, and many more.

[1] COASTAL MANAGEMENT INFORMATION SYSTEM; NAIROBI CLEARINGHOUSE MECHANISM; NATIONAL ANTARCTICA DATA CENTRE; AGULHAS-SOMALI LARGE MARINE ECOSYSTEM DATA CENTRE; AFRICAN COELACANTH ECOSYSTEMS PROGRAMME DATA CENTRE; MILLENIUM ASSESSMENT SGA

The diagram presents a summary of this meta-architecture, on three levels: the communities of use, the portal functions, and the supporting meta-data and data repositories.

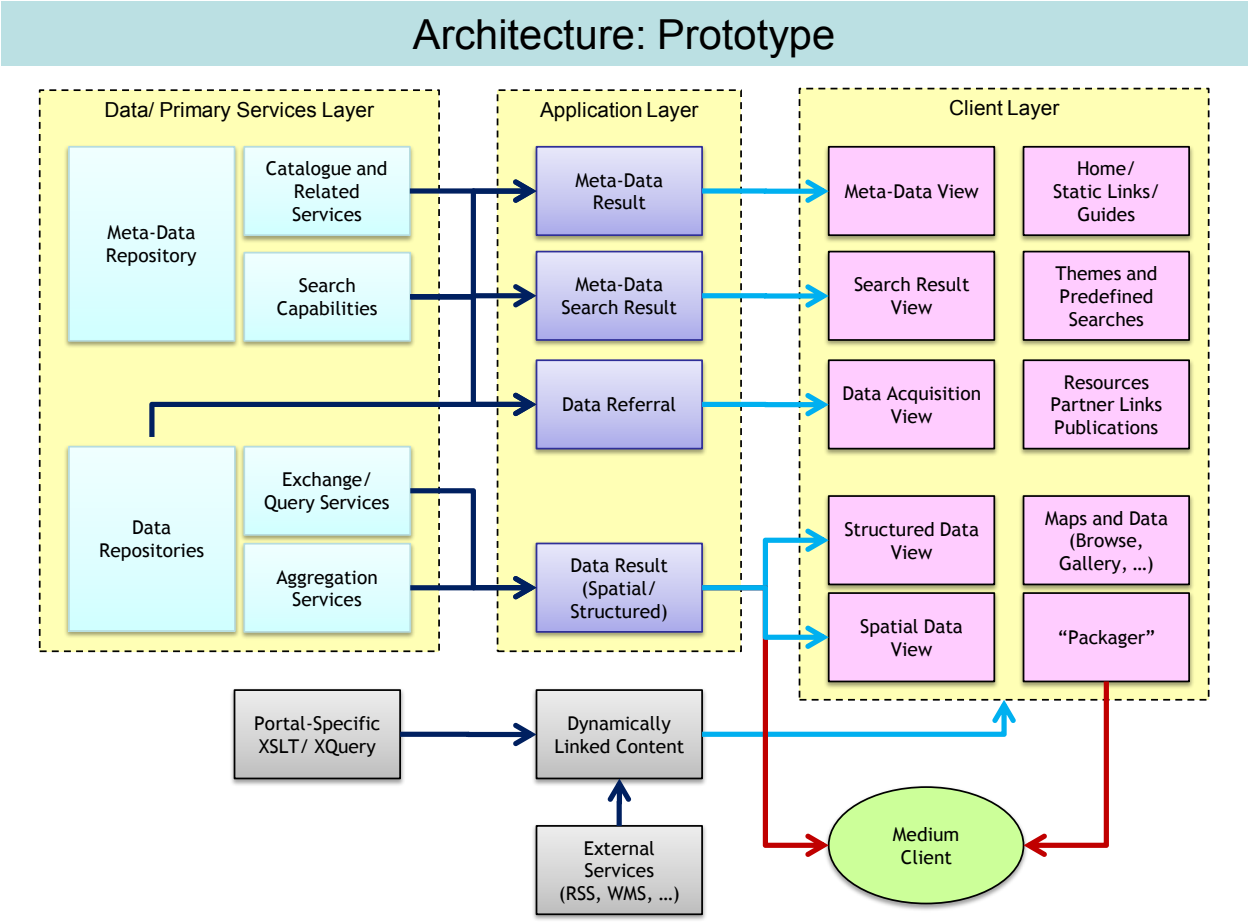


The notes and diagrams below provide a blueprint for a feasible architecture, based on the existing CoGIS platform, and making copious use of available open source components, especially from the stakeholder community and GEOSS.

In this architecture, maximum use is made of existing CoGIS components.

1. The backbone of the architecture, as a set of ***primary services and data layer***, will be provided by CoGIS, specifically the following:
    a. A meta-data repository, capable of managing all appropriate meta-data standards (see Annexure A) through:
        i. Registration and maintenance of automated harvesters to replicate meta-data to the SAEOS repository;
        ii. Validation of individual meta-data records against appropriate standards;
        iii. Limited editing and maintenance of records (applicable if SAEOS is the primary source of the meta-data record);
        iv. Provision of harvesting services to other collaborative portals.
    b. Search capabilities against the meta-data repository, implemented as one or more services. These services must support at least the standards recommended by GEO, so as to enable interoperability with other GEOSS components (R-004);
    c. A data repository, capable of

i. storing spatial data in one of the following default map server environments:
    1. GeoServer,
    2. MapServer,
    3. Or ArcGIS.
ii. Storing publications, images, reports, and structured data sets in a variety of formats;
iii. Allowing services to retrieve these items and to provide them to users as automated data acquisition links;
iv. Allowing map services to provide spatial data to the portal itself, and to



other requesting systems or users.

2. CoGIS will be extended to support a number of ***back-end interoperability processes***, as follows:
    a. EML, FGDC, and ISO 19115:
        i. translation between EML and the biological profile of the FGDC;
        ii. ability to align FGDC with the ISO 19115 spatial meta-data standard. Some work in this regard is under way at the USGS (O-031).

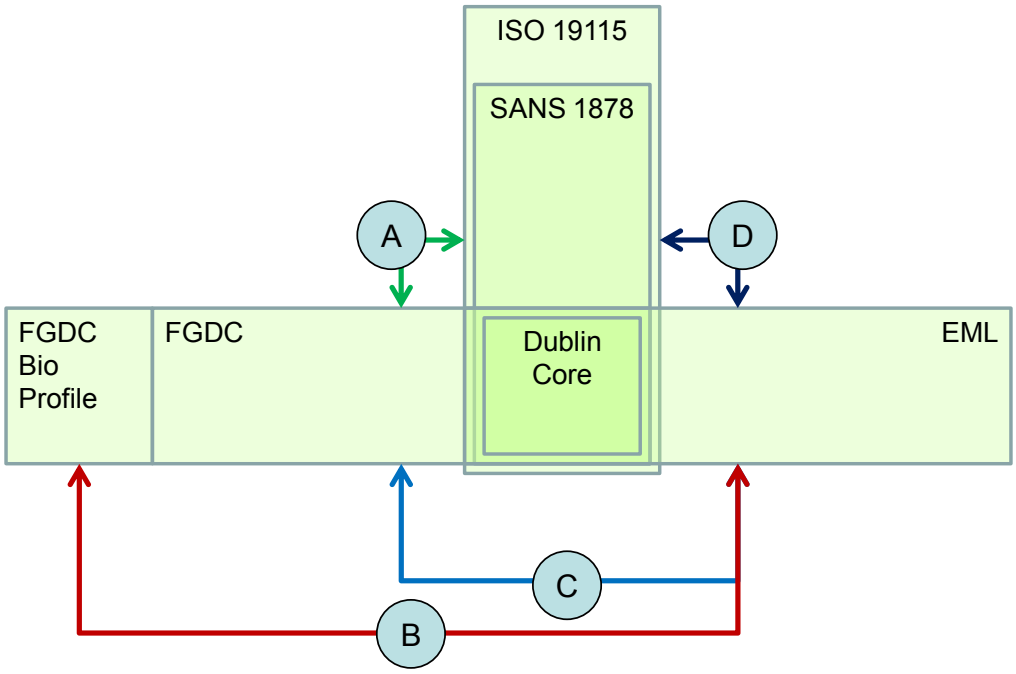
iii. These translation artefacts (XSLT) will be extended and utilized to provide a seamless transition between meta-data clearinghouses utilizing the standards applicable to their domain and/or jurisdiction. See figure below ("Standards Translations").

iv. In doing so, US-based clearinghouses will be able to harvest meta-data unique to SAEOS and translate these to FGDC with biological profile extensions, and SAEOS will be able to harvest meta-data from US clearinghouses, and translate these to SANS 1878/ EML or ISO 19115/ EML, as required.

b. Darwin Core needs a crosswalk to EML, in both directions. This will enable the unification of searches against SABIF/ GBIF – type species occurrence repositories with searches against all other meta-data ***in a single search operation***.

3. An ***application layer*** is required, to marshal services and data in support of the following:

Architecture: Standards Translations ('Crosswalks')



A: Translation between FGDC and ISO19115 / SANS 1878 (Spatial Meta-Data)
B: Translation between FGDC Biological Profile and EML
C: Translation between FGDC and EML 'Spatial Coverage Element'
D: Translation between ISO 19115/ SANS 1878 and EML 'Spatial Coverage Element'

a. A consolidated set of information pertaining to a single meta-data record;

b. A result set of meta-data records, resulting from a search against the clearinghouse repository, either by a user or a system;

c. A data referral, as one of the following options:

i. A local data set/ content item (hosted in the data repository);

ii. A pointer to a remote URL, as provided by the associated meta-data;
iii. A page containing contact information whereby the data resource or content item can be obtained, should a URL not be available.

d. A data result, which can be a spatial data set offered as a Web Map Service, or a structured data set offered for download, or a content item offered for viewing/ download.

e. In addition, the application layer handles aspects such as visibility of content to users and communities, users and their communities, the publication life cycle of the content referenced in the portal, and other security/ access/ and privilege related tasks. Note that harvested meta-data records, with minor exceptions, will all be considered as 'published', especially in prototyping.

4. ***Dynamically linked content*** or ***portlets*** can be marshalled by the client or by the application layer, typically by requesting RSS feeds, or invoking services, through HTTP. Examples of this behaviour include:
   a. Google Earth can be invoked as a backdrop for layers in a map viewer, even though the application layer need not be aware of its existence as a map service through meta-data.
   b. RSS feeds can be invoked to provide links to external resources (images, publications) on the basis of a common identifier (such as LSID), without the application layer requiring any additional information about the service.
5. A ***client layer*** is required – this presents
   a. A combination ('mash-up') of the following:
      i. Data streams obtained from the main function of the portal (meta-data, content, or spatial data), usually as XML to be transformed.
      ii. Portlets or external linked content as appropriate for the view,

      typically for standard pages containing
      1. a single meta-data record, either as text or a map, or both;
      2. multiple meta-data records, either as text or a map;
      3. a content instance (map, portal item, download page);
      4. a composite map of several spatial data content instances, all of which are map services.

   b. Typical static or less dynamic pages, representing the following generic groups:
      i. Home pages, background to the portal, legal documents (disclaimers, privacy statements, conditions of use), guidelines and user support, and similar.
      ii. "Theme" pages, which can be thought of as home pages devoted to a special partnership or theme, and makes substantive use of predefined map views, predefined searches, and predefined dynamic links.
      iii. Sets of resources, publications, and links to partner and contributor sites.
6. A ***medium client***[2] may be of some use, but this forms part of our ambitious goal. If implemented, it can benefit from packaging assistance (i.e. marshalling and shaping data sets for download and client-side analysis). In our task list for the project, a 'simple

[2] In the CoSAMP/ CoGIS environment, a medium client is taken to be a feature-rich mapping and data analysis environment that enhances thin-client mapping tools through client-side plug-ins or extensions.

aggregator' is defined, capable of some client-side manipulation of spatial data representations, using technology such as SVG/ JavaScript or JavaFX, together with Ajax.

Design Directives

GEO: GEOSS Architecture

Platform	SAEON	SAEOS	R&VA	WDCBHH	Other

#	Description	Discussion	Specification
GEO-001	Search Interfaces	The search interfaces to GEOSS components are standardised by GEO guidelines (R-004). These, in turn, are based on well-known and widely implemented search standards, such as OGC-CSW and Z.39.	OGC-CSW Z.39 OpenQuery
GEO-002	Search Results	The search results returned by components that are compliant with the GEO guidelines (R-004) are based on well-known meta-data schema, such as Dublin Core and FGDC.	Range of Meta-Data Standards
GEO-003	Search Interface Implementation	The GEO recommendations low for KVP, XML, and SOAP implementations	KVP XML SOAP

CSW: OGC Specification for Catalogue Services

Platform	SAEON	SAEOS	R&VA	WDCBHH	Other

#	Description	Discussion	Specification
CSW-001	Query Language	The search interface supports OGC Common Query Language	OGC-CSW Z.39 OpenQuery
CSW-002	Loose Implementation	A 'loose' implementation of the Common Query Language will be supported. In this implementation, if a query variable does not exist, it	OGC-CSW

		is assumed to match.	
CSW-003	Valid Characters and Operators	Defined by BNF specification in OGC-CSW	OGC-CSW
CSW-004	GeoClass Taxonomy	The search interface supports the GeoClass taxonomy for Geospatial filters.	GeoClass
CSW-005	Taxonomies	GetCapabilities service supports a list of available taxonomies	OGC-CSW
CSW-006	OGC Core	OGC Core fields will be supported	OGC-CSW See IIS-03
CSW-007	Core Extensions	OGC Core fields will be extended for specific communities. For example, the following community extensions are envisaged: (1) SAEON (EML, SANS 1878, Darwin Core) (2) SAEOS (All) (3) Risk Atlas (EML, SANS 1878, Darwin Core)	Internal
CSW-008	Default Service Description	This is based on ISO 19115:2003	ISO 19115:2003
CSW-009	Default Return Format	Return format must comply with ISO 19115:2003 Core Fields and with ISO 19139 XML encoding standard	ISO 19115: 2003 ISO 19139

CON: Content Types

Platform	SAEON	SAEOS	R&VA	WDCBHH	Other

#	Description	Discussion	Specification
CON-001	Content Types	Content types can include the following: (1) Peer-reviewed Journal Publications (2) WRC Reports (3) Client Reports (4) Work in Progress	Internal
CON-002	Content Formats	Content can include the following: (1) Documents (PDF, DOC, ZIP, XLS, ODF, …). (2) Images, (3) Map services (WMS, WFS, WCS, KML, Proprietary) (4) Map Projects,	WMS WFS WCS KML Internal

		(5) Predefined Searches, (6) Links to external resources and documents.	
CON-003	Collaboration	Collaboration content can be shared through (1) Publication life cycles; (2) Blogs	Internal Plone
CON-004	Publication Life Cycle	Support is provided for six primary life cycle states: (1) create, (2) update, (3) publish, (4) translate, (5) archive, (6) and retire	Plone
CON-005	Categorization of Content	Provision should be made for the categorization of content into 10-12 main categories.	Ontology/ Controlled Vocabulary

CIT: Citation Management

Platform	SAEON	SAEOS	R&VA	WDCBHH	Other

#	Description	Discussion	Specification
CIT-001	Provision	All portal content can provide a citation, as one of the following: (1) A citation provided in meta-data takes precedence, (2) Followed by a citation created from portal information.	Meta-Data Standards
CIT-002	Export	A Citation or Citations need to be downloadable in a widely supported format, and can be imported into widely used citation management software packages.	Zotero EndNote CSL
CIT-003	Import	Citations can be imported into the portal as meta-data records, requiring translation from CSL into an appropriate standard (most likely Dublin Core).	Dublin Core CSL

USC: User Communities

Platform	SAEON	SAEOS	R&VA	WDCBHH	Other

#	Description	Discussion	Specification
USC-001	Community	A user community can be created by and administrator.	Internal
USC-002	Default Content	Each user community is established by default with the following (1) The means of maintaining one or more controlled vocabularies, for categorization of content and provision of consistent keywords; (2) A customizable search facility, in which the appropriate meta-data standard for that community can be configured; (3) A content repository, in which content can be created and linked to one or more meta-data repositories for that community.	Internal
USC-003	Visibility	Community content can be limited to other community users, but can also be (1) Shared with other communities; (2) Published selectively for public view.	Internal
USC-004	Discretionary Tools	User communities can, at their discretion, maintain one or more of the following: (1) News items; (2) Events; (3) Blogs.	
USC-005	User Communities and Roles	Table below provides more detail	

		Platform	SAEOS	SAEON	Risk Atlas	GEOSS	WDC - BHH	NSIF
Typical User Domain								
National Provincial and Local Government		Implicit	Yes	Yes	Yes	Implicit	Implicit	Yes
Research Community		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Private Sector		Yes	Implicit	Yes	Yes	Yes	Implicit	Yes
Civil Society		Yes	Implicit	Yes	Yes	Yes	No	Yes
	International Networks and Institutions	Yes	Yes	Yes	Implicit	Yes	Yes	Implicit
Typical Roles								
	Administrator	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Knowledge Worker	Yes	Yes	Yes	Yes	Yes	Yes	Yes

	Decision-Maker	Yes	Yes	Yes	Yes	Implicit	Implicit	No
	Research User	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Casual User	Yes	Implicit	Yes	Yes	Yes	No	No
	Automated System Access	Yes	Yes	Yes	No	Yes	Yes	Yes

THM: Themes and Promotion of Selected Content

Platform	SAEON	SAEOS	R&VA	WDCBHH	Other

#	Description	Discussion	Specification
THM-001	Theme Construction	A registered user can construct a theme, as follows: (1) By creating a page in the portal for the theme; (2) By linking the page to pre-defined searches (PDS), returning content appropriate to the theme; (3) By linking the page to predefined result visualizations; primarily maps (PRV). (4) Links to additional pages, which can be external or internal to the portal.	Internal PDS PRV

PDS: Pre-Defined Searches

Platform	SAEON	SAEOS	R&VA	WDCBHH	Other

#	Description	Discussion	Specification
PDS-001	PDS Construction	A registered user can construct a pre-defined search, as follows: (1) By specifying a search of any complexity, using any search facility provided by the portal; (2) By using the available tools to copy the search definition for future use.	Internal
PDS-002	Search Result	A search result is displayed in one of a number of supported formats	SRV

	Visualization	(SRV).

SRV: Search Result Visualisation

Platform	SAEON	SAEOS	R&VA	WDCBHH	Other

#	Description	Discussion	Specification
SRV-001	Search Result Format	Search Results are returned as one the following supported formats: (1) Internal CoGIS (HTML) (2) XML – GeoRSS (3) XML – CSW Core Queryables	IIS-03
SRV-002	Search Result Visualization	A search result is displayed in one of a number of supported formats (SRV): (1) Internal CoGIS format; (2) Geo-RSS: List; (3) Geo-RSS: Map; (4) CSW: List.	SRV

PRV: Predefined Result Visualisation

Platform	SAEON	SAEOS	R&VA	WDCBHH	Other

#	Description	Discussion	Specification
PRV-001	Predefined Result Visualization	Visualizations include: (1) SRV (See above) (2) Predefined maps, available as Web Context Documents (WCD) (3) Predefined charts, available as visualizations and Google Fusion tables	WCD Google Fusion

PAC: Packaging Content for Off-Line Use

Platform	SAEON	SAEOS	R&VA	WDCBHH	Other

#	Description	Discussion	Specification
PAC-001	Packaging Favourites	Favourites are collected as a series of any valid content items, provided that these are downloadable or can be packaged for download.	See table below

Content Type	Portal Format	Downloaded Format
KML Map Layer	KML	Local KML
WMS Service	WMS	Downloaded SHP/ KML/ GML file, if available
WFS Service	WFS	Downloaded SHP/ KML/ GML file, if available
PDF Document	PDF	Downloaded PDF
Images	BMP, GIF, JPG, PNG	Downloaded Image File
Office Documents	PPT, DOC, XLS	Downloaded files (* not visible if MS Office is not installed or incorrect version, to be avoided).
Maps	WCD	Downloaded WCD
OpenOffice.org Documents	ODF	Downloaded ODF (* not visible if OpenOffice.org is not installed).

PAC-002	Framework Capabilities	The framework for downloaded content is a simple HTML/ JavaScript based frame, allowing the following: (1) Arrangement of content in a hierarchy of resources (items by case study, or by topic, or by content type). (2) Display of content, including the following: a. Downloaded HTML; b. Downloaded maps and charts; c. Downloaded PDF documentation. (3) Links to portal-based resources (user guides, updates, searches, refresh packaged materials).	Internal

UHS: User Help and Support

Platform	SAEON	SAEOS	R&VA	WDCBHH	Other

#	Description	Discussion	Specification
UAS-001	User Manual	Each major function will be documented in a user manual entry with a	Internal

		functional bias (i.e. 'How To').	
UAS-002	Frequently Asked Questions	Frequently Asked Questions will be maintained as a set of searchable items, after users have logged questions in the issue log.	Internal
UAS-003	Issue Log	Users will be able to log issues (usability, errors, questions) for follow-up by a support mechanism.	Internal

Section 2: Use Cases and Detailed Requirements

Typical Use Cases

SSD: Search and Discovery Use Cases

To be completed.

General User Requirements Shared By All Mapping Clients

The following list defines the three types of mapping clients for which this document contains information.

TMC: Types of Mapping Client

#	Description	Discussion	Specification
TMC-001	Thin Client	A thin client provides standard web mapping functionality (image-based) by coupling a suitable container (ASPX, Java) to a standardised web map service.	OGC-WMS OGC-WFS KML Google Maps Ajax
TMC-002	Medium Client	A medium client extends the capabilities of a thin client to include: • Additional local processing capabilities; • Composition of maps from local and web map service sources. • Support for local vector rendering and charting using plug-ins such as SVG, JavaFX, or Flash.	Internal OGC-WMS OGC-WCS W3C-SVG
TMC-003	Desktop Client	A desktop client is a traditional desktop GIS with the ability to interact with standard OGC services and transactional operations through WFS.	OGC-WMS OGC-WFS OGC-WCS

GUI: Standard Graphical User Interface and Layout Requirements

#	Description	Discussion	Specification	Release
GUI-001	Map Window	The map window provides a large part of the available screen space for layer rendering.	IIS-01 BRC	Release 1
GUI-002	Menu Bar	The menu bar collects all functionality with the exception of layer control. This includes navigation, selection, and standard map operations (see below)	IIS-01 NAV, LEG, SEL, MAP	Release 1
GUI-003	Map Context	A small context map is shown with a bounding	IIS-01	Release 1

		box corresponding to the current map extent.	CON	
GUI-004	Map Scale	Map scale is indicated as a measure bar in units of choice.	IIS-01 MSC	Release 1
GUI-005	North Arrow	A north arrow can be configured for the application (i.e a pointer to an image file) and is always displayed.	IIS-01	Future Release
GUI-006	Legend	Legends are rendered based on the configured symbology for the portal, themes as appropriate, and layer grouping definitions, if applicable.	IIS-01 SYM, DEF, LEG, STH	See below
GUI-007	Layer Control	The layer control needs to provide three interrelated functions: (1) Layer re-ordering ** (2) Selection of Active Layers (3) Layer Visibility	IIS-01	Release 1
GUI-008	Layout Options	A number of standard screen layout options can be provided to assist with divergent user needs.	IIS-02	Release 1
GUI-009	Editable Layout	A drag-and drop interface is provided to assist users with definition of a customisable layout.		Future Release
GUI-010	Position	Display of current cursor location in map units *usually decimal degrees)	IIS-01	Release 1
GUI-011	Map Title	Each map should have a title that corresponds to (1) the title given to it in the portal definition; (2) The title in the Web Map Context Document	IIS-02	Release 1
GUI-012	Data Sources	Refer to standard layer and legend manipulation requirements below	LEG	Release 1
GUI-A01	Frame in Portal	The frame is rendered in the portal on one of 2 modes: (1) Directly as a Plone CMS page, deployed on the portal server. (2) As a remote page, encapsulated in the WindowZ frame for Plone, which seamlessly embeds a page from a remote server in the Plone CMS. Neither of these modes have any impacts on the mapping client.	WindowZ Plone CMS IIS-02	Release 1
GUI-A02	Calls to Mapping Client	Calls to the mapping client from the Plone CMS will be by way of an HTTP request with a query string.	IIS-02	Release 1
GUI-B01	Default Layout	The default layout is controlled by a query string parameter	IIS-02	Release 1

GUI-C01	Detailed Layout	Map window components are described in an internal specification	IIS-02	Release 1

BRC: Rendering Capabilities

#	Description	Discussion	Specification	Release
BRC-001	Image Rendering	Thin Client Implementations can render at least one of a variety of image and vector formats, as allowed by the OGC-WMS/ WFS specification.	OGC-WMS OGC-WFS OpenLayers	Release 1
BRC-002	KML Rendering	The thin client implementation allows rendering of KML objects as a separate, client-side layer overlaying the basic map image.	Google Maps KML	Release 1
BRC-003	SVG Rendering	The thin client implementation allows rendering of an SVG Layer as an overlay.	W3C SVG	Unspecified
BRC-004	Anti-Aliasing	Anti-aliasing is always on provided the image serving WMS implements it.	Implementation-dependent	Release 1
BRC-005	Backdrop Map Services	The thin client allows backdrop services (Google Maps, Microsoft Live Maps) to be displayed as a layer.	Google Maps Microsoft Live	Release 1
BRC-006	Transparency	Layer transparency can be set individually for each layer	LEG	Release 1
+BRC-007	Layer Looping	A set of layers are sequentially shown in a looped 'slideshow'.	LEG	Release 1

MAP: Standard Map Operations

#	Description	Discussion	Specification	Release
MAP-001	Redraw	Causes all layers currently visible to be redrawn from source.	Internal	Release 1
MAP-002	Refresh Selection	Causes only selected layers currently visible to be redrawn from source (potentially a lot faster).	Internal	Release 1
MAP-003	Print	Print the current map layout, including context	Internal	Future

		information in the layout (title, legend, north arrow, scale, data sources, context map)		Release
MAP-004	Copy to Clipboard		Internal	Release 1

NAV: Navigation

#	Description	Discussion	Specification	Release
NAV-001	Zoom Factor Value	This is the zoom factor value to be used for zoom in/ out operations (factor by which the current bounding box must be grown or shrunk).	Internal	Future Release
NAV-002	Zoom Buffer Value	The buffer value is a fraction of the current bounding box to be used for 'zoom to a feature' operations.	Internal	Future Release
NAV-003	Zoom In	Zoom in with a factor value applied to the current bounding box.	Internal	Release 1
NAV-004	Zoom Out	Zoom out with a factor value applied to the current bounding box.	Internal	Release 1
NAV-005	Zoom Box	Zoom to a bounding box defined by the user.	Internal	Release 1
NAV-006	Zoom Feature	Zoom to a zoom buffer around the feature selected by a client.	Internal	Future Release
NAV-007	Zoom Layer	Zoom to the bounding box for the entire layer.	Internal	Future Release
NAV-008	Zoom All	Zoom to the composite bounding box for all the layers.	Internal	Release 1
NAV-009	Zoom Previous	Zoom to a previous bounding box (potentially to an element in an array of bounding boxes).	Internal	Release 1
NAV-010	Zoom Scale	Zoom to a predefined factor associated with a scale defined in the user interface.	Internal	Future Release
NAV-011	Pan (Direction, Magnitude)	Pan to a direction indicated by the user, and with a magnitude (usually close to one current bounding box width) defined by the system.	Internal	Deprecated
NAV-012	Pan (Drag)	Pan to a new position indicated by dragging the map image to a new position.	Internal	Release 1

SEL: Standard Selection Behaviour

#	Description	Discussion	Specification	Release
SEL-001	Simple Selection/ Simple Information	Simple Selection Functions: Click on single features and obtain a simple popup of attribute values. The retrieval of information is only performed for the currently active layer and in the absence of meta-data, all column data with DB column names are displayed. Screen. (KML-type functionality in Google Earth).	Internal	Existing
SEL-002	Select within Bounding Box	The user drags a bounding box on the map, and features included in or intersecting with the bounding box are reported in a pop-up window.	Internal	Existing
SEL-003	Select within Radius	The user drags a circle on the map, and features included in or intersecting with circle are reported in a pop-up window.	Internal	Unspecified
SEL-004	Select Individually	User activates a tool that allows multiple clicks to add features to a collection of selected features.	Internal	Unspecified
SEL-005	Select by Query	A query tool based on the column structure of the active layer is generated and is used to select records for further processing.	Internal	Unspecified
SEL-006	Select between Layers	A selection layer is indicated in addition to an active layer. Selection processes are based on intersects between a feature selected in the selection layer and the active layer.	Internal	Unspecified
SEL-007	Selection Behaviour Toggle	Toggles selection behaviour between inclusion and overlap.	Internal	Unspecified
SEL-008	Transformed Information	All Selection Functions: Based on selection result, obtain an HTML popup of attribute values. These values are transformed by configuration meta-data to allow the following: (1) Column aliases; (2) Hyperlinks to external resources; (3) Markup to embed images and other valid content. (4) Designated fields (columns) only.	GoogleMaps KML is a good staring point. KML-like XHTML is generated on the fly from configuration meta-data.	Unspecified.
SEL-009	Selected Features	Indication of selected features by (1) Indicating a bounding box (consistent with Windows object selection in	Internal	Unspecified

		graphical interfaces) (2) Recolouring selected features (consistent with desktop GIS behaviour)		

#	Description	Discussion	Specification	Release
CON-001	Simple Context	An extent box corresponding to the current map VIEW extent is shown to provide context. The layer to be used as a context map is set at a portal level.	Internal	Release 1
CON-002	Configurable Context map	A context map is configured by defining a layer in a web map source and a default rendering extent.	Internal	Future Release
CON-003	Extended Map Navigation	A change to the extent box on the context map causes the main map window to zoom to a new extent.	Internal	Release 1

MSC: Scale Indications

#	Description	Discussion	Specification	Release
MSC-001	Simple Scale	Scale is indicated in a measure bar using default units of measure	Internal	Release 1
MSC-002	Unit Adjustment	Unit of measure is adjusted dependent on user preference and is associated with future rendering of the map.	Internal	Future Release
MSC-003	Ratio Scale	A ratio scale is shown dependent on user preference.	Internal	Future Release

LEG: Standard Layer and Legend Manipulation

#	Description	Discussion	Specification	Release
LEG-001	Control: Active	One layer in a map can be marked as active. This results in queries, analyses, and selections being performed on the layer.	Internal	Future Release

LEG-002	Control: Visible	Layers can be marked as visible/invisible. The map has to be redrawn for this to take effect in thin clients, or can be selectively switched without redraw/ server calls.	Internal	Release 1
LEG-003	Legend	Legend display is based on settings in the Web Context Document	WCD SYM, STH	Release 1
LEG-004	Toggle	The Legend View and Control View can be toggled.	Internal	Release 1
LEG-005	Data Sources	Data sources (acknowledgements, citations, etc.) for the layers must be displayed as a footer to the map, layer or legend display. Pop-up windows associated with layer entries can also be used. The Web Context Document must serve as a source for the citations.	Internal	Release 1
LEG-006	Extended Data Sources	Extended data sources are provided as hyperlinks to source anchored to a layer control or legend entry on WFS layers.	Internal	Future Release

STH: Simple Theme Implementations*

#	Description	Discussion	Specification	Release
STH-001	Unique Values	Users can select any field, and provided no more than N unique values are identified, a theme is defined for the user with automated assignment of symbology to unique values. (1) Point Features: a portal-wide configurable symbol definition (symbol, size), colours vary to a predetermined portal-wide palette. (2) Line features: colours vary to a predetermined portal-wide palette. (3) Polygon features: colours vary to a predetermined portal-wide palette.	Internal/ SYM	Future Release
STH-002	Simple Classes	Users can select any numeric field, and a theme is defined for the user with automated assignment of symbology to N equal range classes. (1) Point Features: a portal-wide configurable symbol definition (symbol, size), colours vary to a predetermined portal-wide start and end colour, sizes vary to a portal-wide start and end value.	Internal	Future Release

		(2) Line Features: colours vary to a predetermined portal-wide start and end colour, line thickness vary to a portal-wide start and end value. (3) Polygon features: colours vary to a predetermined portal-wide start and end colour.		
STH-003	Natural Breaks	Same as STH-002, but instead of N equal ranges N natural breaks are determined from statistical assessment.	Internal	Future Releases
STH-004	Percentiles	Same as STH-002, but instead of N equal ranges N percentiles are determined from statistical assessment.	Internal	Future Releases
STH-005	Dot Density	Random dots are generated for polygon layers based on a statistical assessment of the range of values.	Internal	Unspecified
STH-006	Chart Themes	Pie or bar charts based on one or more numeric columns in the designated layer. Colours are selected from a portal-wide predetermined palette. An additional reference column that determines chart sizing can be specified.	Internal	Unspecified
STH-007	Label Themes	A column is defined by the user to apply as a label theme. The label theme reads a set of portal-wide settings from configuration and this determines fonts, default font size and colour, whether overlaps are allowed and whether label sizes should change with zoom percentage.	Internal	Unspecified

Core Data Sets

The following list defines core data sets for specific applications of the platform.

CDR: Risk and Vulnerability Atlas

#	Description	Discussion	Specification
CDR-001	TIP	The TIP (Toolkit for Integrated Planning) is a series of data sets available from Built Environment, CSIR, dealing with human demography and activity. Specific data sets will be confirmed by CSIR. Data sets will be available from TIP as WMS and as quarter-degree-based KML files.	WMS KML
CDR-002	BGIS	BGIS (Biodiversity GIS) is a series of data sets prepared by SANBI, and available as SHP files. These have to be registered in a repository that can provide it to users as a WMS. Depending on the type of data, the data is made available as KML in quarter-degree format or in original shape format.	WMS KML
CDR-003	CSAG	The Climate Systems Analysis Group at UCT is making a series of climate change scenario results available as GeoTIFF files. These need to be converted to WMS and KML sources and hosted in CoGIS.	WMS KML GeoTIFF
CDR-004	GBIF	SANBI (SABIF) and others contribute approximately 5.5 million Darwin core records to GBIF. Of these, roughly 5 million are geo-referenced and can be mapped as part of the Atlas. Constraints exist on download size, alternatives should be sought (direct download/ harvesting from GBIF).	GBIF Internal KML Darwin Core
CGR-005	AGIS	The Agricultural Geo-Referenced Information System (AGIS) consists of sub-sets of data: (1) AGIS Comprehensive Atlas (2) Orientation Atlas (3) SADC Atlas (4) Demarcated Agricultural Land (5) Weeds and Invasive Plants (WIP_	KML WMS

CDS: SAEON Core Data Sets

#	Description	Discussion	Specification

CDS-001	SAEON	WMS KML
CDS-002	SANPARKS	
CDS-003	SADCO	
CDS-004	SAIAB	
CDS-005	EKZNW	
CDS-006	MCM	

CDE: SAEOS Core Data Sets

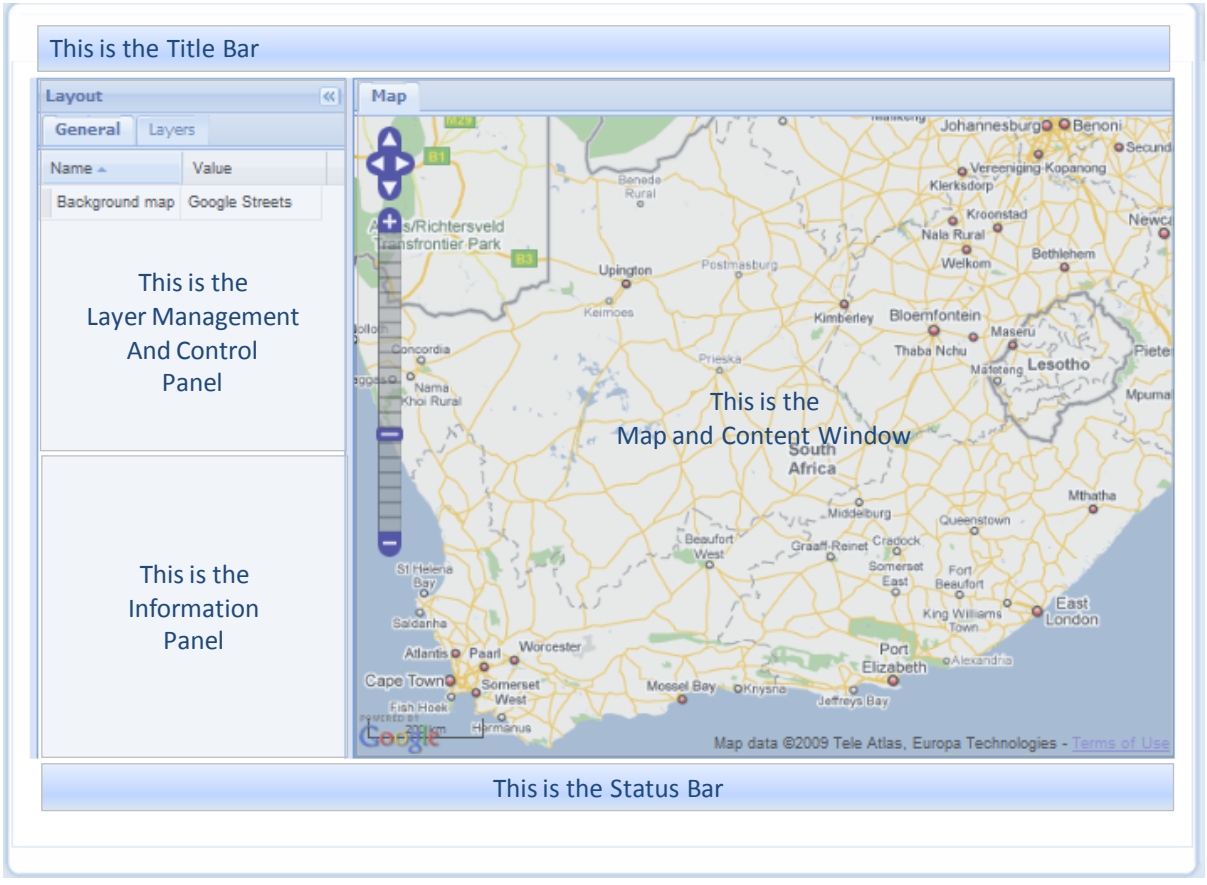
#	Description	Discussion	Specification
CDE-001	SAC	The satellite applications centre offer the following 1. SPOT 5 (2005-8) 2. CBERS (2008-9) 3. SSAC (2008-9)	WMS KML
CDE-002	CDSM	The Chief Directorate, Surveys and Mapping, offer publicly available data sets, currently hosted at SAC: 1. Urban Cadaster 2. Rural Cadaster 3. Roads 4. Highways (3 classes)	WMS
CDE-003			

Annexure: System Specifications

A. Internal Interface Specifications

IIS-01: Mapping Client Interface Layout

#	Description	Discussion	Specification	Release
IIS-01-01	Style of Presentation	The thin client has five main panel components with sub-components: (1) Title Bar (2) Layer and Layer Management Control Panel (3) Map (Content) Window (4) Information Panel (5) Status and Feedback Bar	See below	Release 1



IIS-01-02		(1) Layer and Layer Management Control a. List of Layers (Tab)	Release 1

b. Layer Management (Tab)

c. Legend (Tab)

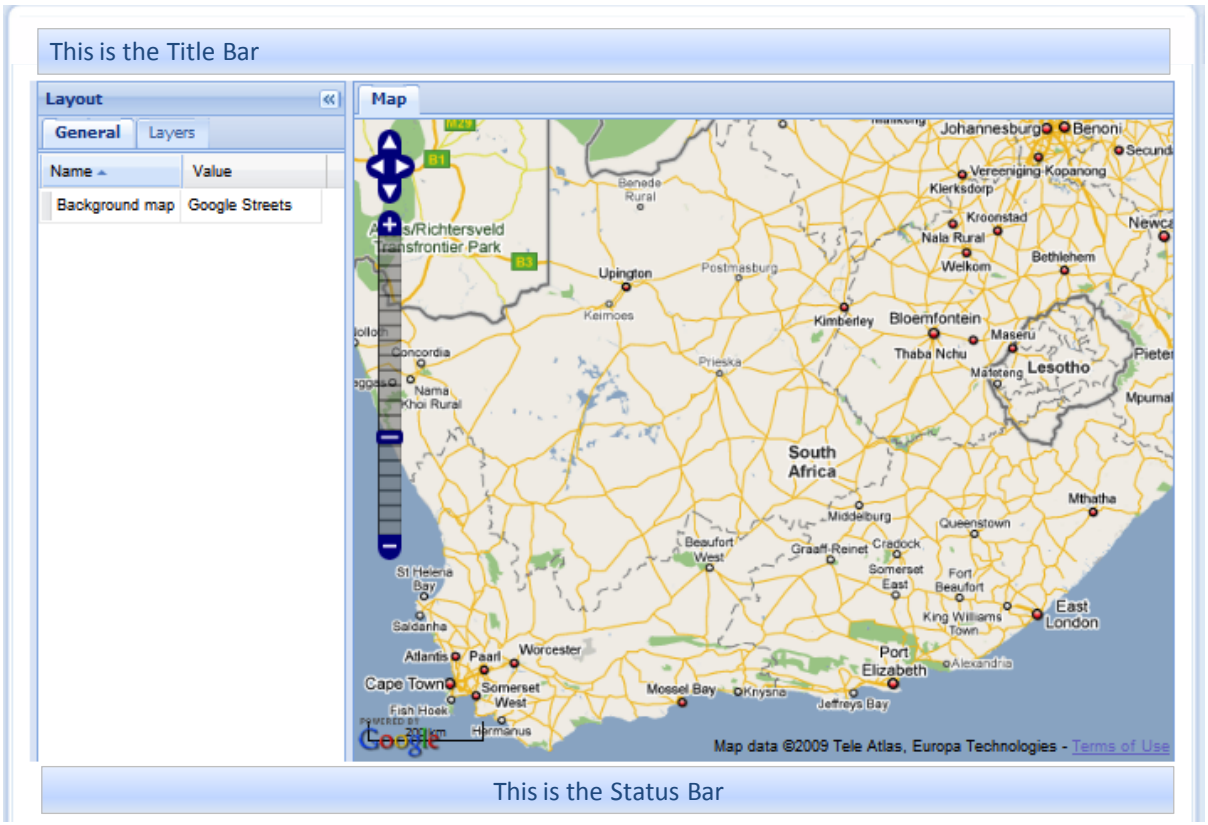
(2) Portal Commands

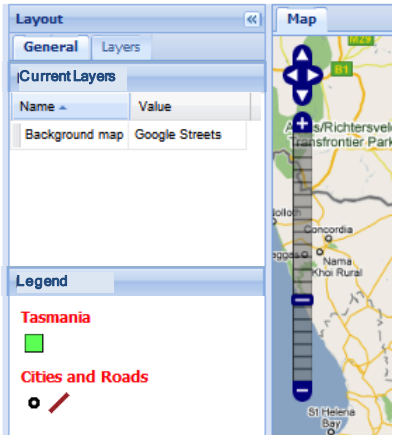
a. Loads a configurable list of portal commands

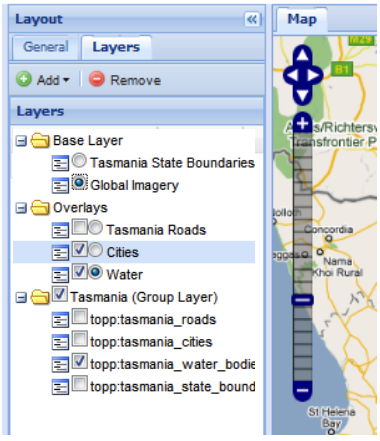
i. Favourites

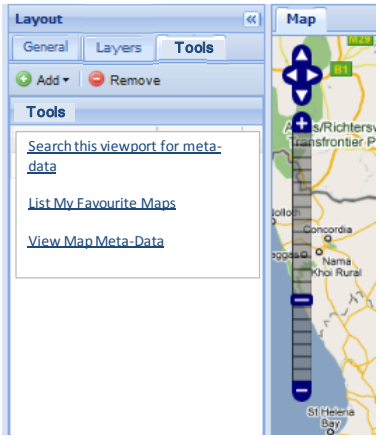
ii. Search this viewport for meta-data

iii. View Map Meta-Data







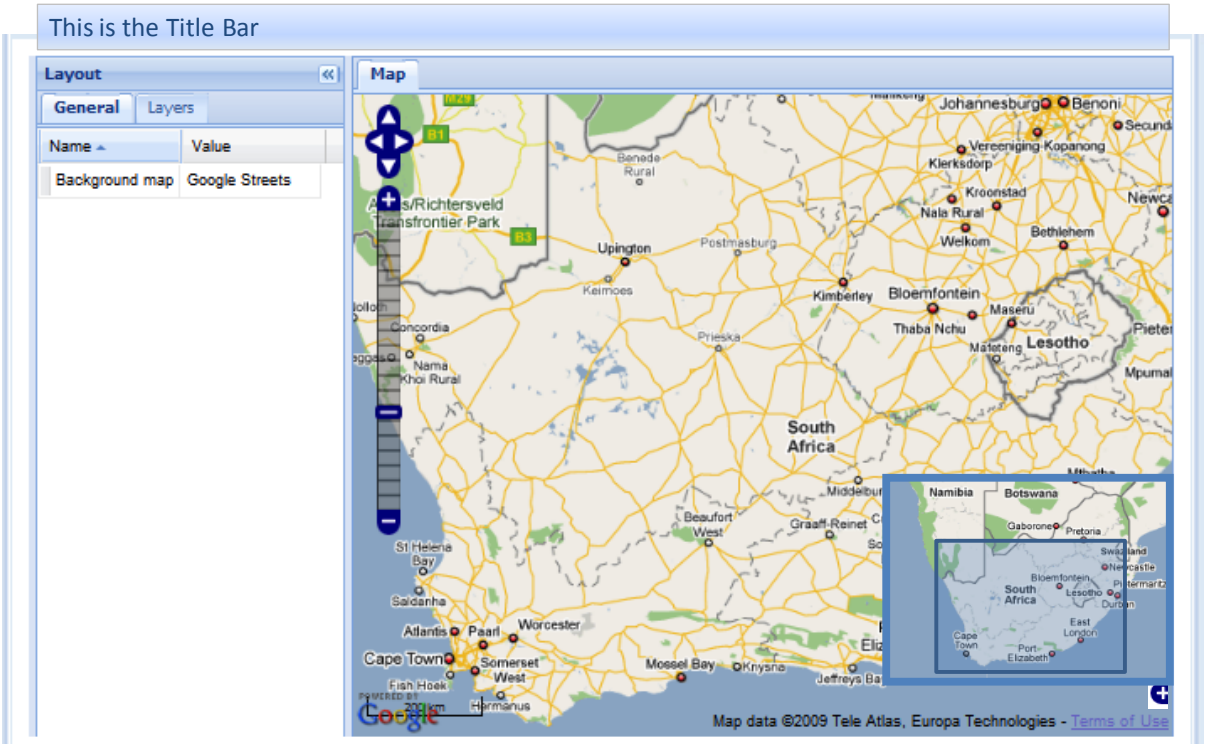


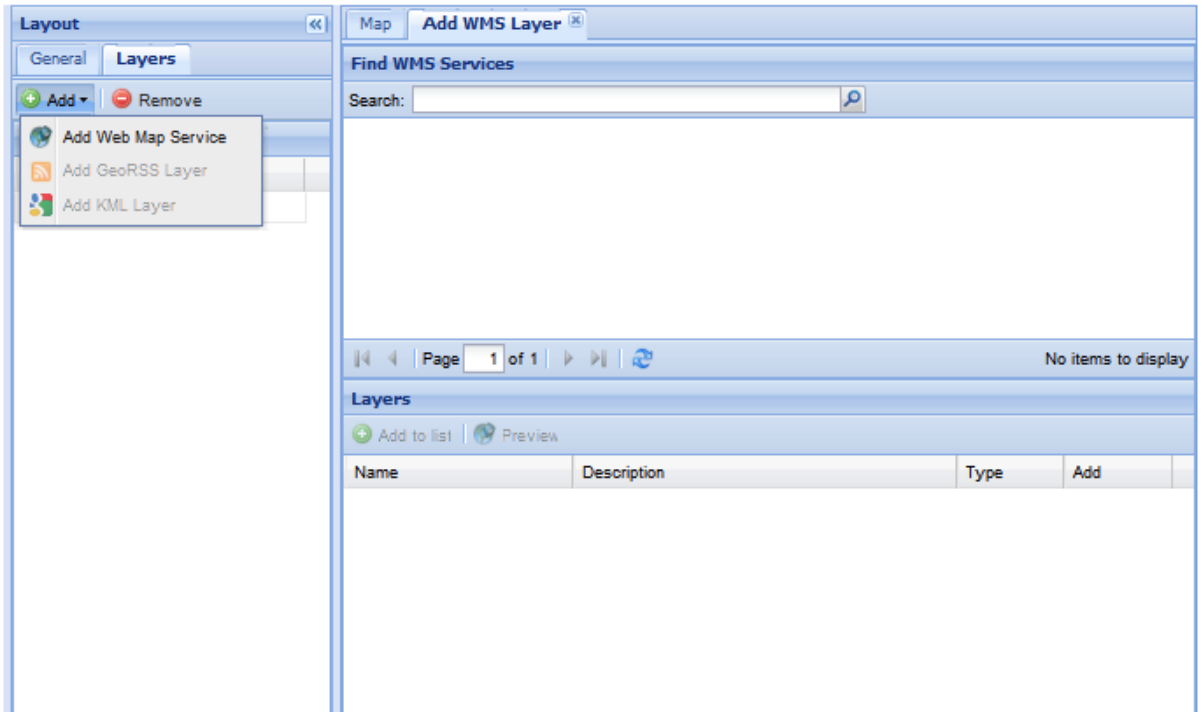
a. Map View

i. Context Window Sub-View

b. Search View

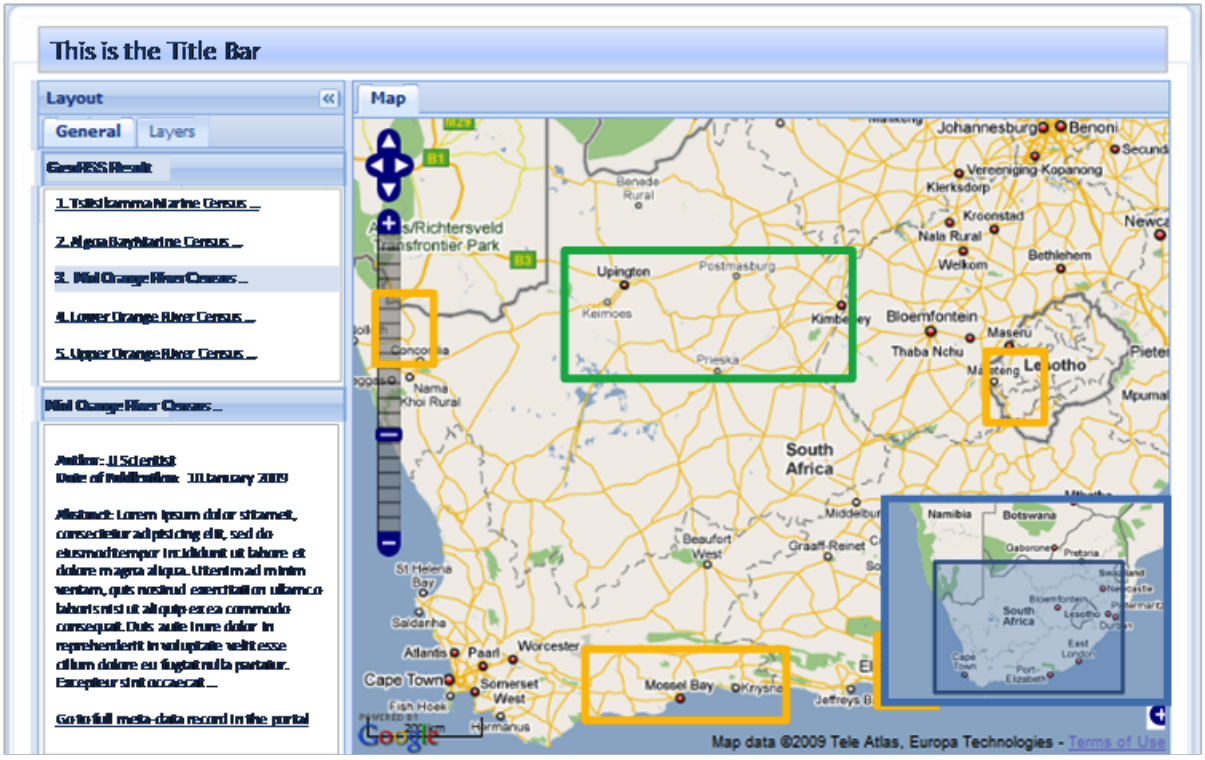
c. Layer Acquisition and Information View





a. Layer Meta-Data Abstract and Links

b. Data Sources




This is a View of an Expanded Map or Content Window
Map
Johannesburg
Benoni
Secunda
Swaziland
Vereeniging
Kopanong
Klerksdorp
Kroonstad
Newcastle
Nala Rural
Welkom
Bethlehem
Upington
Postmasburg
Kimberley
Bloemfontein
Thaba Nchu
Maseru
Lesotho
Pietermaritzburg
Durban
Mpumalanga
Port Nolloth
Concordia
Komaggas
Nama Khoi Rural
Prieska
South Africa
Middelburg
Queenstown
Mthatha
Beaufort West
Graaff Reinet
Cradock
Somerset East
Fort Beaufort
King Williams Town
East London
St Helena Bay
Saldanha
Atlantis
Paarl
Worcester
Cape Town
Somerset West
Fish Hoek
Hermanus
Mossel Bay
Knysna
Port Elizabeth
Alexandria
Jeffreys Bay
Map data ©2009 Tele Atlas, Europa Technologies - Terms of Use
This is the Status Bar

IIS-02: System Interfaces

#	Description	Discussion	Specification	Release
IIS-02-01	HTTP Call to Map Component	The Map Component is called with a parameter string, defining one of the following: (1) Open a WMS Layer for viewing (2) Open a WMS Service with All Layers (3) Open a KML for viewing (4) Open a GeoRSS for viewing (5) Open a Web Map Context Document for Viewing	See below	Release 1
IIS-02-02	Default Display	The Map Component can be instructed to show the default view or the alternative view.	See below	Release 1
IIS-02-03	Query String parameters	The following parameters are supported: (1) HREF: The URL to a WMS, KML, GeoRSS, or Web Context source (2) STYLE: Absent – Default; 1-Default, 2-Alternative View (full screen map)		Release 1
IIS-02-04	Portal Search Interface	The search facility accepts the current viewport bounding box as a parameter, and adds search parameters. The return format is GEoRSS (XML).	IIS-03	Release 1
IIS-02-05	My Favourites Interface	The Favourites interface returns an RSS XML format containing a list of predefined searches.	IIS-04	Release 1

IIS-03: Search Request and Return Format

#	Description	Discussion	Specification	Release
IIS-03-01	Calls to the Portal Search Facility	External components can pass a call to an XML search service in the portal. This is a two-step process: (1) GetCapabilities: retrieve the service meta-data (2) GetRecords: submit a standardized query and obtain an XML result.	See below	Release 1
IIS-03-02	Supported criteria	A core set of parameters are supported (See table 1 below). These parameters are supported even if the underlying meta-data does not map to it. Mandatory elements that must be supported and returned are: (1) Title (2) Identifier (3) AnyText	See Tables 1,2, and 3 below.	Release 1

Table 1 — Common Queryable Elements

Name	Definition	Data type
Subject [a]	The topic of the content of the resource [b]	CharacterString
Title [a]	A name given to the resource	CharacterString
Abstract [a]	A summary of the content of the resource	CharacterString
AnyText	A target for full-text search of character data types in a catalogue	CharacterString
Format [a]	The physical or digital manifestation of the resource	CharacterString
Identifier [a]	An unique reference to the record within the catalogue	Identifier
Modified [c]	Date on which the record was created or updated within the catalogue	Date-8601
Type [a]	The nature or genre of the content of the resource. Type can include general categories, genres or aggregation levels of content.	CodeList f
BoundingBox [d]	A bounding box for identifying a geographic area of interest	BoundingBox, See Table 2
CRS [e]	Geographic Coordinate Reference System (Authority and ID) for the BoundingBox	Identifier
Association	Complete statement of a one-to-one relationship	Association, See Table 3

a Names, but not necessarily the identical definition, are derived from the Dublin Core Metadata Element Set, version 1.1:ISO Standard 15836-2003 (February 2003)

b Typically, a Subject will be expressed as keywords, key phrases or classification codes that describe a topic of the resource. Recommended best practice is to select a value from a controlled vocabulary or formal classification scheme.

c DCMI metadata term <http://dublincore.org/documents/dcmi-terms/>.

d Same semantics as EX_GeographicBoundingBoxclass in ISO 19115.

e If not supplied, the BoundingBox CRS is a Geographic CRS with the Greenwich prime meridian.

f A "CodeList" is a CharacterString taken from an authoritative list of CharacterStrings or Identifiers. The authority may optionally be identified in the value.

Table 2 — Composition of compound element "BoundingBox"

Name	Definition	Data type
WestBoundLongitude	Western-most coordinate of the limit of the resource's extent, expressed in longitude in decimal degrees (positive east)	numeric
SouthBoundLatitude	Southern-most coordinate of the limit of the resource's extent, expressed in latitude in decimal degrees (positive north)	numeric
EastBoundLongitude	Eastern-most coordinate of the limit of the resource's extent, expressed in longitude in decimal degrees (positive east)	numeric
NorthBoundLatitude	Northern-most, coordinate of the limit of the resource's extent, expressed in latitude in decimal degrees (positive north)	numeric

Future Release

Table 3 — Composition of compound element "Association"		
Name	**Definition**	**Data type**
Target	Referenced resource	Identifier
Source	Referencing resource	Identifier
Relation	The name of the description of the relationship	CodeList or Identifier

IIS-03-03 HTTP Call Format of the HTTP call is defined below See below Release 1

Table 4: CoGIS Search Service Interface Implementation (Key Value Pairs): **Fields marked as *: Optional but supported for internal CoGIS functionality.**	
Description	**Interface Definition**
URL	http://<baseURL>/metadata_tool/GetRecords?
ReturnType	&returntype=<1,2,3>
AnyText	&anytext=<some text>
Date Range*	&fromdate=yyyy-mm-dd
	&todate=yyyy-mm-dd (default is always today's date)
Modified – PublicationDate	&modified= yyyy-mm-dd
Title	&title=<some text>
Abstract	&abstract=<some text>
Subject	&subject=<some text>
Extent (Spatial Bounds)	&extent=<MinX - West>%2C<MinY - South>%2C<MaxX - East>%2C<MaxY - North>
WestBoundLongitude	&WestBoundLongitude=LO
SouthBoundLatitude	&SouthBoundLatitude=LA
EastBoundLongitude	&EastBoundLongitude=LO
NorthBoundLatitude	&NorthBoundLatitude=LA
Spatial Search Type*	&spatialtype=<Contains, Equals, Intersects, Touches, Within, Outside> (by default, if absent, equates to "Contains".
Taxonomic Coverage*	&eml_TaxonomicCoverageRankName=<Kingdom, Phylum, Genus, Species>
	&eml_TaxonomicCoverageRankValue=<some text> a
a: Add to anytext	

IIS-03-04	Return	One of the following formats are returned: (1) Internal CoGIS format (2) XML is returned, in GeoRSS format. (3) Core returnable properties, as recommended by GEO, based on OGC-CSW (Common Element Set) as Dublin Core XML (Default)	See below	Release 1
IIS-03-05	Standard CoGIS Return	This is rendered as HTML for display in the portal as a search result.	Internal	Release 1
IIS-03-06	GeoRSS Return	Returned as GeoRSS for lightweight applications	RSS 2.x GeoRSS-Simple Table 5	Release 1

Table 5: CoGIS Search Service Interface Implementation
Result Format: GeoRSS

GeoRSS Item Tag	Portal Meta-Data	Field Name: Dublin Core	Field Name: EML	Field Name: SANS 1878	Term used in OGC queryables	Definition
<title>		Title	Title	Dataset Title	Title	A name given to the resource. Also known as "Name".
<link>	Portal Object URL (meta-data page)					
<author>		Creator	Individual	Dataset Responsible Party Name		An entity primarily responsible for making the content of the resource.
<pubDate>		Date		Dataset Reference Date		
<category> one for each keyword		Subject	Keywords	Dataset Topic Category	Subject	A topic of the content of the resource. This is a place where a Topic Category or other taxonomy could be applied.
<description>		Description	Abstract	Dataset Abstract	Abstract	An account of the content of the resource. This is also known as the "Abstract" in other aspects of OGC, FGDC, and ISO metadata.
<custodian> extension to RSS		publisher	Organisation	Metadata Point Of Contact Organization Name		An entity responsible for making the resource available. This would equate to the Distributor in ISO and FGDC metadata.
<source url="">	Online Resource	Source	Online Distribution Info	Online Resource URL	Source	A reference to a resource from which the present resource is derived.
<language>		Language		Dataset Language		A language of the intellectual content of the catalogue

						record.
<geo:lat>		Longitude				
<geo:long>		Latitude				
<georss:box>south west north east</georss:box>		BoundingBox		West Bounding Coordinate South Bounding Coordinate East Bounding Coordinate North Bounding Coordinate	BoundingBox	
<description> (add to abstract)		Rights	License and Usage Rights			Information about rights held in and over the resource.
<urltype>	Determined from portal context					This is obtained as follows - KML in keywords or online url: "KML" WMS in keywords: "WMS" WFS in keywords: "WFS" Else if bounding box or lat long: "RSS"

Green: Mandatory Elements

Example Output Below.

```
<?xml version="1.0" encoding="UTF-8"?>
<rss xmlns:gml="http://www.opengis.net/gml"
     xmlns:georss="http://www.georss.org/georss"
     xmlns:geo="http://www.w3.org/2003/01/geo/wgs84_pos#"
     xmlns:dc="http://purl.org/dc/elements/1.1/">
     version="2.0">
  <channel>
    <title>Test GeoRSS for projects</title>
    <link>http://test2-CoGIS.qsens.net</link>
    <description>This is an example GeoRSS feeds to be used for projects
registered by SAEON in its projects database</description>
    <language>en</language>
    <copyright>All rights reserved. Your generic copyright statement
</copyright>
    <category>Flagship Projects</category>
    <generator>SAEON Projects DB</generator>
    <ttl>20</ttl>
    <item>
      <title>Tierberg Karoo National Park</title>
      <link>http://www.fao.org:80/geonetwork?uuid=d7ac155c-c2f4-4c25-b8f6-
6a25dc93bc9a</link>
      <category>Flagship Projects</category>
        <urltype>RSS</urltype>
      <description>
        This project assembled,
        organised, analysed and archived 20 years worth of various
        long-term datasets (raw data, photographs, publications, etc.) as a
        contribution to the SAEON node for Arid Lands.
      </description>
      <pubDate>2009-06-10T17:20:07</pubDate>
      <image width="100" type="image/gif"
url="http://test2.mbv.co.za/saeon/images/flag_tierberg.png"/>
      <!--location-->
```

```
      <geo:lat>-33.18</geo:lat>
      <geo:long>22.26</geo:long>
    </item>
    <item>
      <title>ACEP</title>
      <link>http://www.saiab.ac.za/index.php?pid=136"</link>
      <category>Flagship Projects</category>
        <urltype>RSS</urltype>
      <description>
        Since its inception in April 2002 ACEP has filled a void in
oceanographic and marine ecological sampling on the continental shelves of the
east coast of southern Africa and the south-western Indian Ocean.
      </description>
      <pubDate>2009-06-10T17:20:07</pubDate>
      <image width="100" type="image/gif"
url="http://test2.mbv.co.za/saeon/images/flag_coelecanth.png"/>
      <!--location-->
      <geo:lat>-33.000</geo:lat>
      <geo:long>32.000</geo:long>
    </item>
    <item>
      <title>This is a test for a bounding box and WMS in GeoRSS</title>
      <link>http://www.fao.org:80/geonetwork?uuid=d7ac155c-c2f4-4c25-b8f6-
6a25dc93bc9a</link>
      <category>Flagship_Projects</category>
        <category>Second_Keyword</category>
        <category>WMS</category>
        <urltype>WMS</urltype>
      <description>
        This project assembled ...
      </description>
        <source url="http://mesonet.agron.iastate.edu/cgi-
bin/wms/nexrad/n0r.cgi">This links to a WMS</source>
      <pubDate>2009-06-10T17:20:07</pubDate>
      <image width="100" type="image/gif"
url="http://test2.mbv.co.za/saeon/images/flag_tierberg.png"/>
      <!--location-->
      <georss:box>-33.18 18.00 -30.00 23.00 </georss:box>
    </item>
  </channel>
    <item>
      <title>This is a test for a bounding box and KML File</title>
      <link>http://www.google.com</link>
      <category>Gauteng</category>
        <category>Second_Keyword</category>
        <category>KML</category>
        <urltype>KML</urltype>
      <description>
        This project assembled ...
      </description>
        <source url="http://www.swdev.co.za/saeon/layers/gauteng urban edge
2007 ver 5.kml">This links to a WMS</source>
      <pubDate>2009-06-10T17:20:07</pubDate>
      <image width="100" type="image/gif"
url="http://test2.mbv.co.za/saeon/images/flag_tierberg.png"/>
      <!--location-->
      <georss:box>-23.18 22.00 -20.00 25.00 </georss:box>
    </item>

</rss>
```

Table 6: CoGIS Search Service Interface Implementation
Basic CSW Result Format

Tag Name	Dublin Core element name	Term used in OGC queryables	Definition	Data type
<dc:title>	title	Title	A name given to the resource. Also known as "Name".	CharacterString
<dc:creator>	creator		An entity primarily responsible for making the content of the resource.	CharacterString
<dc:subject>	subject	Subject	A topic of the content of the resource. This is a place where a Topic Category or other taxonomy could be applied. Lists of keywords are supplied here.	CharacterString
<dc:description>	description	Abstract	An account of the content of the resource. This is also known as the "Abstract" in other aspects of OGC, FGDC, and ISO metadata.	CharacterString
<dc:publisher>	publisher		An entity responsible for making the resource available. This would equate to the Distributor in ISO and FGDC metadata. In portal terms, this is the custodian. Custodian value is used by preference.	CharacterString
<dc:contributor>	contributor		An entity responsible for making contributions to the content of the resource.	CharacterString
<dc:date>	date	Modified	The date of a creation or update event of the catalogue record.	ISO-8601 date
<dc:type>	type	Type	The nature or genre of the content of the resource.	CodeList
<dc:format>	format	Format	The physical or digital manifestation of the resource.	CharacterString
<dc:identifier>	identifier	Identifier	A unique reference to the record within the catalogue.	Identifier
<dc:source url="">	source	Source	A reference to a resource from which the present resource is derived. url: value of the online resource. Tag value: descriptor, such as "Online Resource"	CharacterString
<dc:language>	language		A language of the intellectual content of the catalogue record.	CharacterString
Not implemented in Release 1	relation	Association	The name of the relationship that exists between the resource described by this record and a related resource referenced using the *Source* or *dc:source* property.	CodeList
<dc:coverage>	coverage	BoundingBox		The spatial extent or scope of the content of the resource.

<dc: rights>	rights		Information about rights held in and over the resource.	CharacterString

Example Output Below

```
<?xml version="1.0" ?>
<simpledc xmlns:dc="http://purl.org/dc/elements/1.1/"
xmlns:dct="http://purl.org/dc/terms/">
<dc:title>Meta-Data Implementation in Environmental Sciences</dc:title>
<dc:creator>Wim Hugo</dc:creator>
<dc:subject>ant worm meta-data</dc:subject>
<dc:description>Meta-data, as a means of describing knowledge for improved
future use, is becoming an integral part of scientific endeavour, and brings
obvious benefits. There are, however, several issues, both practical and
philosophical, with its implementation, and the experience of the South
African Earth Observation Network (SAEON) in implementing meta-data standards
for the environmental sciences domain serves as a useful case study. This
experience is used to generalize a set of checkpoints, questions, and a
roadmap that may be useful for wider implementation in other
domains.</dc:description>
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<dc:contributor>Wim Hugo</dc:contributor>
<dc:date>20090520</dc:date>
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</simpledc>
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IIS-04: Favourites Request and Return Format

#	Description	Discussion	Specification	Release
IIS-04-01	Calls to the Portal Favourites Facility	The Map Component can pass a call to an XML favourites service in the portal. This has two forms: (1) Return list of favourites. (2) Post URL to favourites or delete URL from favourites	See below	Release 1
IIS-04-02	Supported criteria	The following parameters are supported: (1) ACTION (2) HREF		Release 1
IIS-04-03	HTTP Call	Format of the HTTP call is defined below	See below	Release 1

Description	Interface Definition
URL	http://saeon.qsens.net/metadata_tool/doFavourites?
Action	&action=<Request, Save, Delete>
Spatial Search Type	&HREF=<any valid search URL as in IIS-03>

IIS-04-04	Return	XML is returned, in RSS format.	See below	Release 1

```
<?xml version="1.0" ?>
 <rss version="2.0">
    <channel>
       <title>My Favourites - Test User</title>
       <link>http://saeon.qsens.net/metadata_tool/doFavourites?Action=Request</link>
       <description>Favourite Searched</description>
       <language>en-us</language>
       <pubDate>Tue, 10 Jun 2003 04:00:00 GMT</pubDate>

       <item>
          <title>Elephant Occurrences</title>
          <link>http://saeon.qsens.net/metadata_tool/doSavedSearch?keywords=elephant</link>
       </item>
       <item>
          <title>Mackerel Occurrences</title>
          <link>http://saeon.qsens.net/metadata_tool/doSavedSearch?keywords=Mackerel</link>
```

```
        </item>
    </channel>
</rss>
```