# DIRECT DATA ACCESS
# WEB SERVICES

IMOS Integrated Marine Observing System

## OGC APIs

### OGC Catalog Service for the Web (CSW)

'Catalog Service for the Web' (CSW or sometimes seen as Catalog Service – Web) is a standard for exposing a catalogue of geospatial records on the Internet (over HTTP).

An example of CSW Get Capabilities request for the IMOS GeoNetwork catalogue is **here.**

### OGC Web Coverage Service (WCS)

The Open Geospatial Consortium (OGC) Web Coverage Service Interface Standard (WCS) defines Web-based retrieval of coverages – that is, digital geospatial information representing space/time-varying phenomena.

AODN offers WCS on a per file basis (for selected datasets) via **THREDDS**.

### OGC Web Feature Service (WFS)

AODN offers Open Geospatial Consortium (OGC) Web Feature Service (WFS) for selected non-gridded data. WFS is a standard protocol for accessing and manipulating geographic features stored in a Geographic Information System (GIS) database over the Internet. The WFS specification is available on the **OGC website**.

WFS services for non-gridded data are provided by **Geoserver**.

A list of geographic features served by the WFS server and the operations supported on them can be accessed using a **WFS GetCapabilities request**.

Each geographic feature type can be described using a WFS DescribeFeatureType request. For example, the XBT Delayed Mode Profile feature type **description**.

The geographic features themselves can be retrieved using a GetFeature request. For example, to **retrieve a list of XBT profiles** taken in a region south of Tasmania in October 2010.

And to **retrieve measurements** taken during a particular profile in a CSV file.

*Filters*

The AODN provides a web service that returns the filtering options available for each WFS and WMS. The filters returned by the service can be used to construct the CQL component of a GeoServer WMS/WFS query.

Requests for enabled filters are constructed in the following form:

**?request=enabledFilters&service=layerFilters&version=1.0.0&workspace=<workspace>&layer=<layer>**

The following example retrieves the available filters for the bio-optical database:

**http://geoserver-123.aodn.org.au/geoserver/wfs?request=enabledFilters&service=layerFilters&version=1.0.0&workspace=imos&layer=srs_oc_bodbaw_trajectory_profile_map**

Having retrieved the available filters you can issue a second request to discover the current filter values:

**?request=uniqueValues&service=layerFilters&version=1.0.0&workspace=<workspace>>&layer=<layer>&propertyName=<filter name>**

The following example retrieves the values for the data_type filter in the bio-optical database:

**http://geoserver-123.aodn.org.au/geoserver/wfs?request=uniqueValues&service=layerFilters&version=1.0.0&workspace=imos&layer=srs_oc_bodbaw_trajectory_profile_map&propertyName=data_type**

### OGC Web Map Service (WMS)

AODN offers Open Geospatial Consortium (OGC) Web Map Services (WMS) for both gridded and non-gridded data. WMS is a standard protocol for serving georeferenced map images over the Internet that are generated by a map server using data from a Geographic Information System (GIS) database. The WMS specification is available on the **OGC website**.

**WMS services for non-gridded data are provided by Geoserver.**

**WMS services for gridded data are provided by Thredds.**

**View an example of a WMS** request for ship tracks in Bass Strait.

### ncURIList Service

The ncUrlList Service is a WFS service that returns a list of http URLs matching a query (e.g. bounding box, time extent …).

The user will perform a **GetFeature** request for a given IMOS layer specifying the “outputFormat” parameter to be equal to “marvl+xml”

See an example of a Get Feature request for IMOS glider real-time data:

**http://geoserver-123.aodn.org.au/geoserver/imos/ows?service=WFS&version=1.0.0&request=GetFeature&typeName=imos:anfog_rt_trajectory_map&maxFeatures=50&outputFormat=marvl+xml**

In this example, the download URL of netCDF file per glider deployment is available in between the xml tag <imos:url>.