OCEAN
INFORMATION
RESOURCES

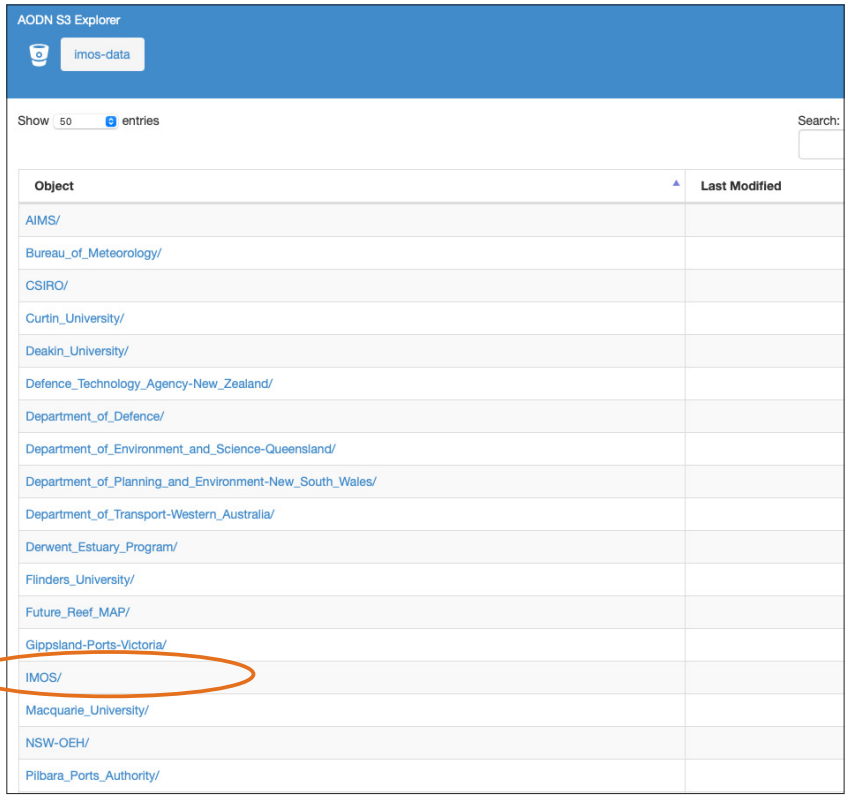
IMOS
Integrated **Marine**
Observing System

ACCESSING IMOS AUSTRALIAN OCEAN DATA NETWORK SEA SURFACE TEMPERATURE AND VELOCITY DATA USING ARCGIS

In this guide, we demonstrate how to use ArcGIS to access two IMOS gridded data products from the AODN. Both datasets, Satellite Remote Sensing: Sea Surface Temperature 6 Day and OceanCurrent Sea Surface Geostrophic Velocity, will be downloaded from our data servers.

PART 1: SST IMPORT

1. Navigate to either the AODN THREDDS server (thredds.aodn.org.au/thredds/catalog.html) or direct from Amazon S3 (https://data.aodn.org.au). Navigate to the IMOS folder.



2. In this example we will use the ‘L3SM 6 day average’ dataset in order to get the most coverage, as the cloud cover gaps have been removed through modelling from previous days.

   There are several types of satellite data available:

L2P -> Single swath, geolocated
L3U -> Single swath, gridded
L3C -> Single sensor, multiple swath, gridded
L3S -> Multiple sensors, multiple swath,
L3SM -> Multiple sensor types, multiple swath
L3SGM -> Multiple sensors, GeoPolar

   For more information regarding IMOS SRS products, visit the catalogue **here**.

   Via THREDDS or S3 Explorer, navigate to IMOS > SRS > SST > ghrsst > L2SM-6D > dn > 2024 > and select the day you would like. In this example, we are using 29th February 2024.

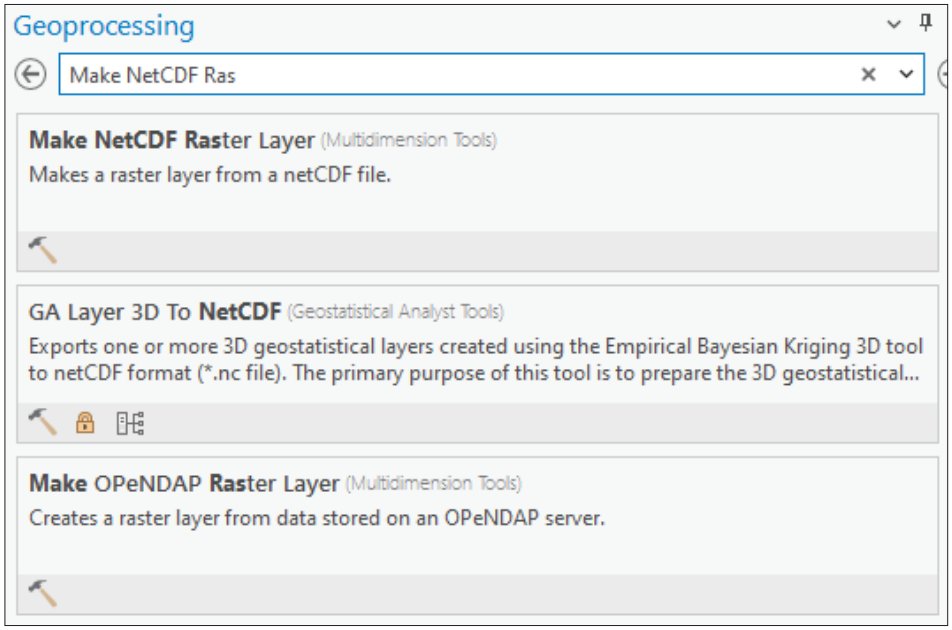
THREDDS

20240217212000-ABOM-L3S_GHRSST-SSTfnd-MultiSensor-6d_dn.nc	199.1 Mbytes	2024-02-23T10:13:25Z
20240218212000-ABOM-L3S_GHRSST-SSTfnd-MultiSensor-6d_dn.nc	199.6 Mbytes	2024-02-24T10:07:25Z
20240219212000-ABOM-L3S_GHRSST-SSTfnd-MultiSensor-6d_dn.nc	200.2 Mbytes	2024-02-25T05:20:59Z
20240220212000-ABOM-L3S_GHRSST-SSTfnd-MultiSensor-6d_dn.nc	200.6 Mbytes	2024-02-26T10:09:21Z
20240221212000-ABOM-L3S_GHRSST-SSTfnd-MultiSensor-6d_dn.nc	199.2 Mbytes	2024-02-27T10:44:22Z
20240222212000-ABOM-L3S_GHRSST-SSTfnd-MultiSensor-6d_dn.nc	199.1 Mbytes	2024-02-28T10:07:35Z
20240223212000-ABOM-L3S_GHRSST-SSTfnd-MultiSensor-6d_dn.nc	199.8 Mbytes	2024-02-29T05:30:29Z

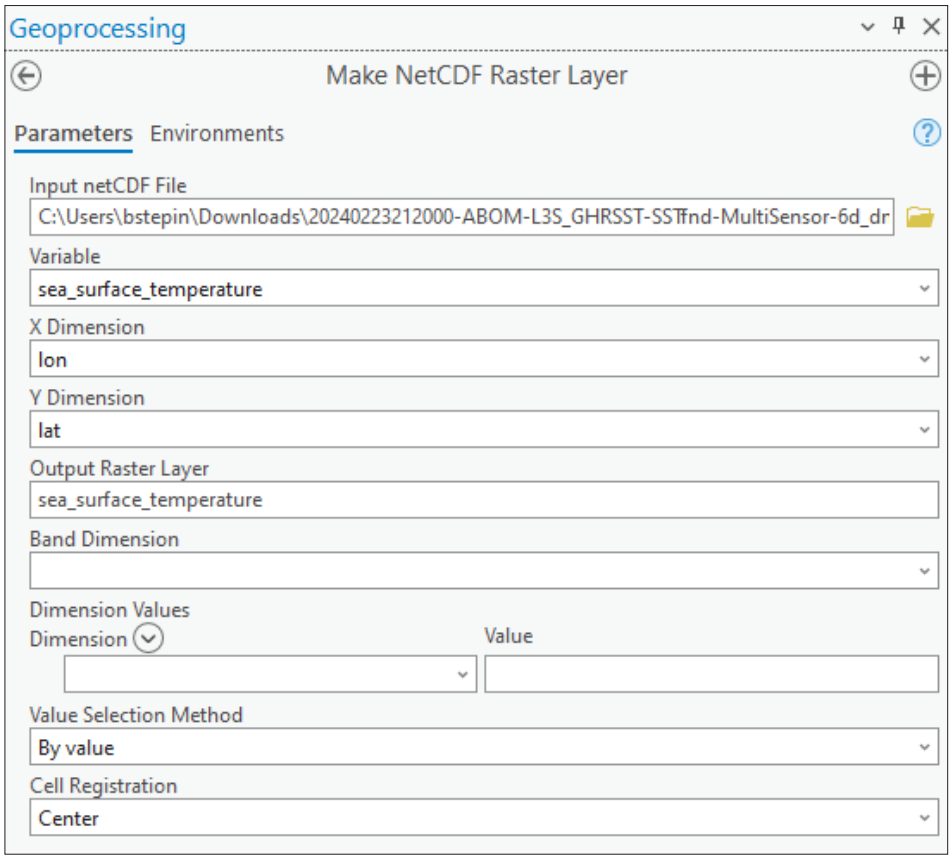
S3 Explorer

20240220212000-ABOM-L3S_GHRSST-SSTfnd-MultiSensor-6d_dn.nc	2024-02-26 21:09:21	191 MB
20240221212000-ABOM-L3S_GHRSST-SSTfnd-MultiSensor-6d_dn.nc	2024-02-27 21:44:22	190 MB
20240222212000-ABOM-L3S_GHRSST-SSTfnd-MultiSensor-6d_dn.nc	2024-02-28 21:07:35	190 MB
20240223212000-ABOM-L3S_GHRSST-SSTfnd-MultiSensor-6d_dn.nc	2024-02-29 16:30:29	191 MB

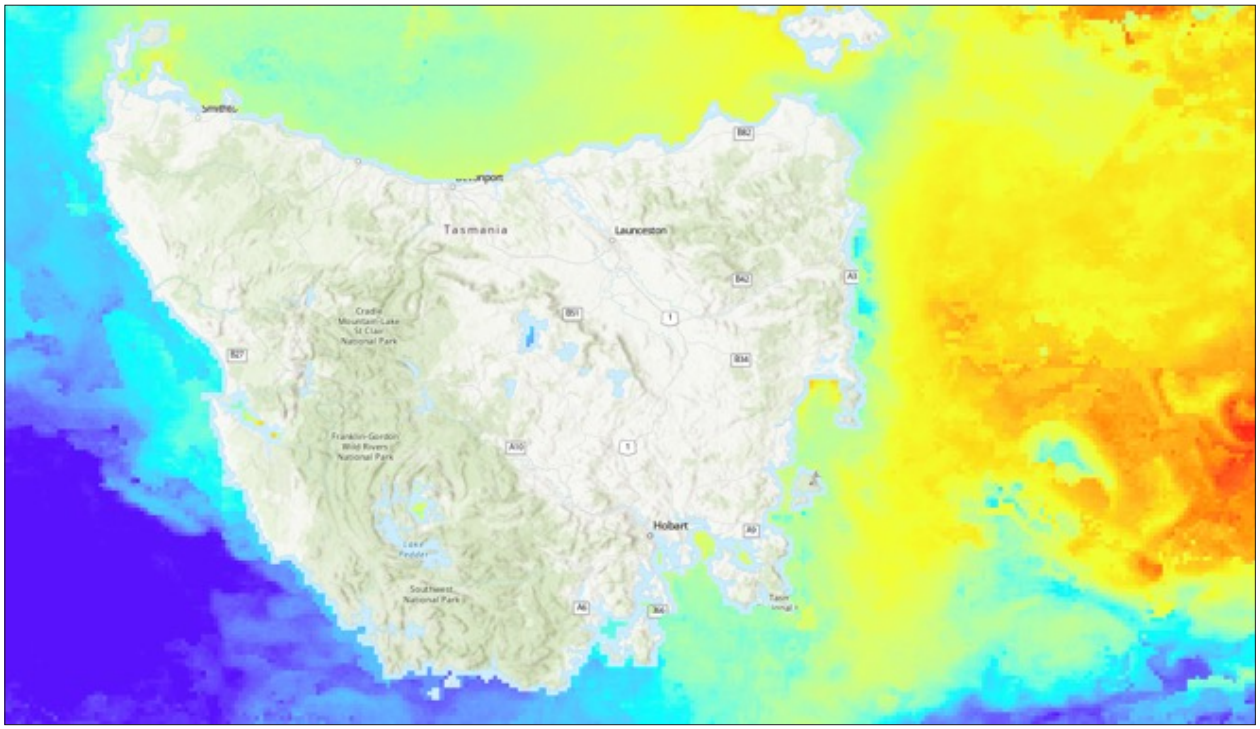
3. Once the NetCDF '.nc' file has downloaded, begin importing the file into ArcGIS for viewing. Open ArcGIS (we are using ArcGIS Pro version 3.0.2). Start a new map or load an existing project, and set up your map as preferred. When ready to import the data, navigate to the Geoprocessing toolbox and search for 'Make NetCDF Raster Layer'.



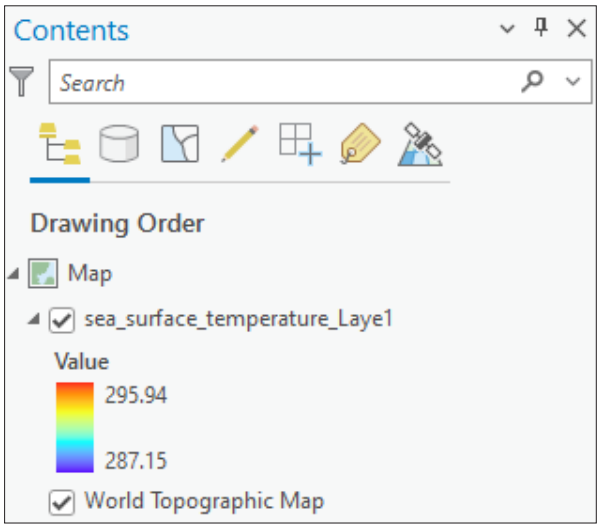
4. Select your downloaded .nc file in order to import it to a raster. Ensure you set the variable to 'sea_surface_temperature' and the Longitude and Latitude are correctly assigned to X and Y respectively. Select an appropriate name for the layer and then run the process.



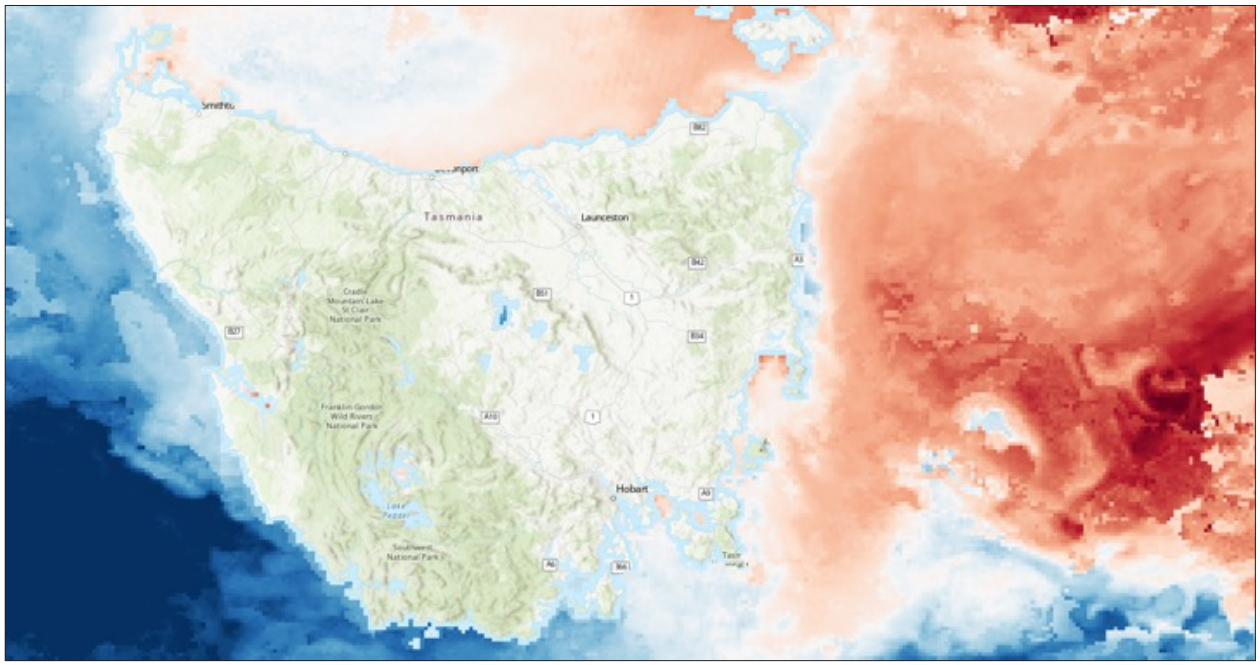
The default import raster will have a very bright symbology.



5. To make it easier to view, adjust the colour values. Navigate to the contents layer on the right, and click on the rainbow symbol to shortcut to the symbology properties. Please note that the max and min values are in the range of 280+ which is degrees K.

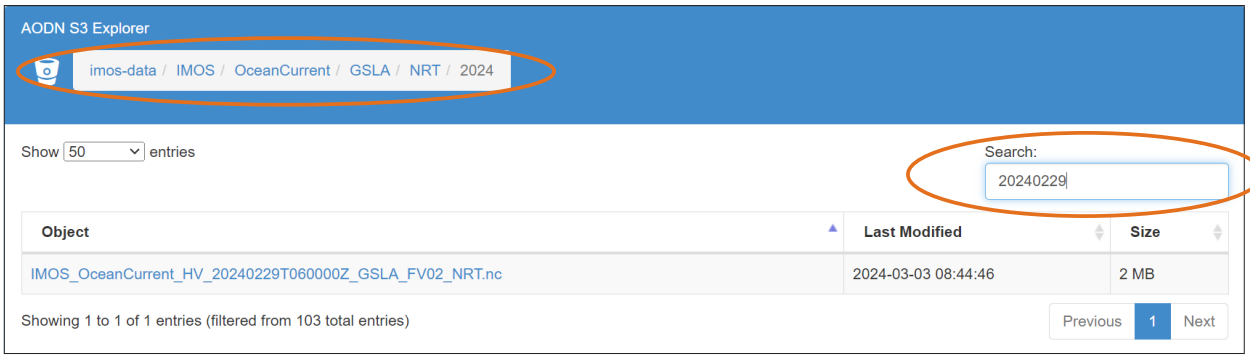


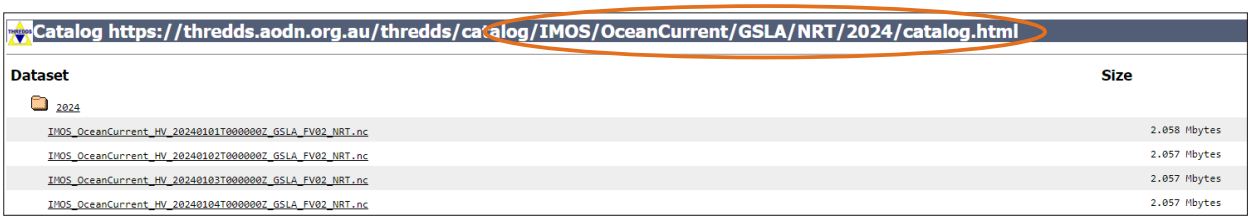
The output should then look similar to this, which will give a six day coverage to a high resolution, and will scale on zoom.

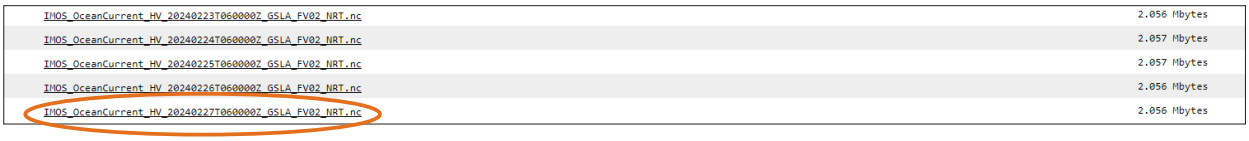


PART 2: OCEAN CURRENTS

6. Navigate to either the AODN Thredds server or direct from Amazon S3 and locate the latest OceanCurrent to download. In this example, we will add velocity vectors to our existing SST map. To achieve this, IMOS receives Geostrophic Velocity products from OceanCurrent (CSIRO). These can be found in IMOS/Ocean/Current/GSLA/NRT/. In this example, we will select the most recent dataset (29/02/2024).

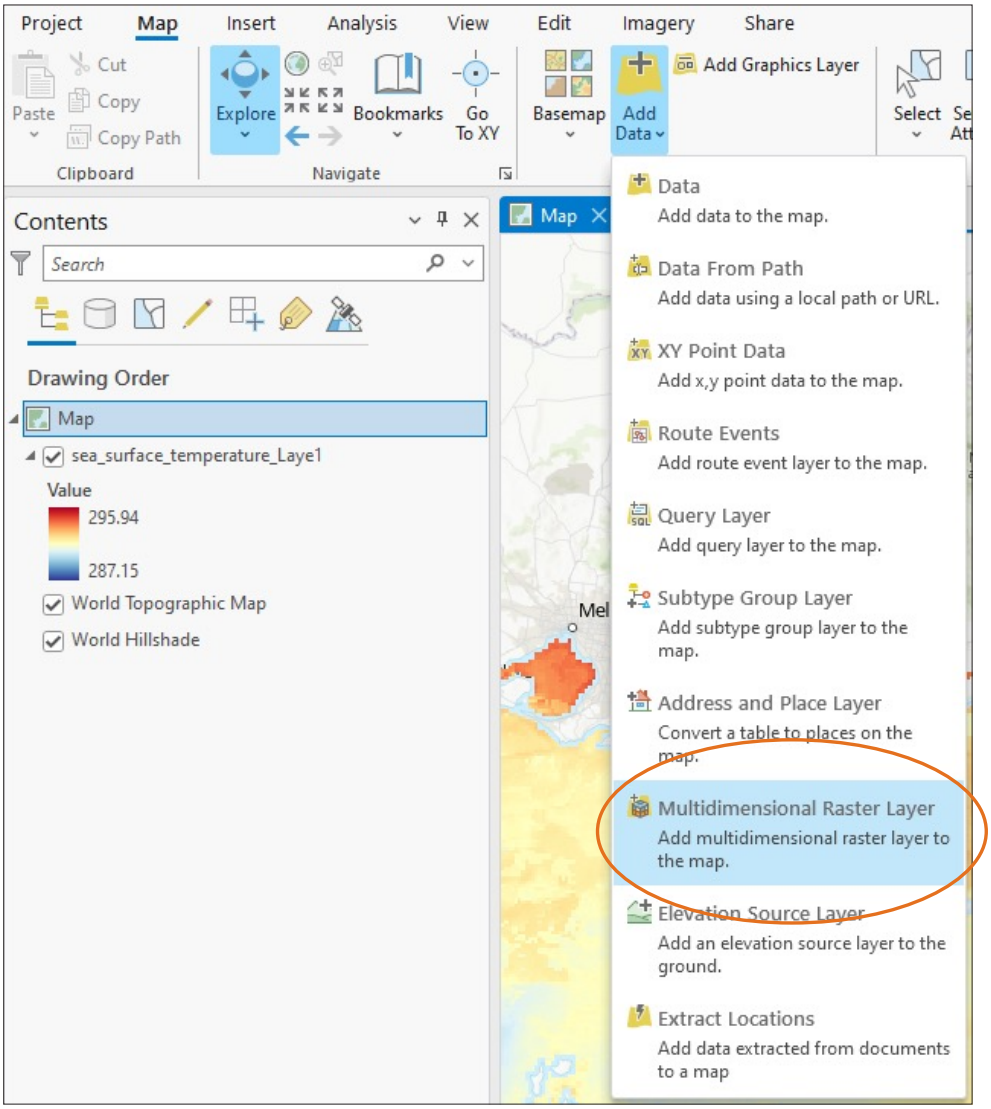






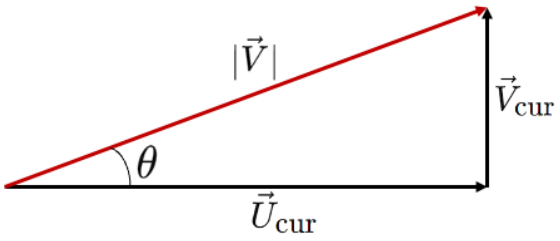
For more information regarding the IMOS OceanCurrent product visit the catalogue **here**.

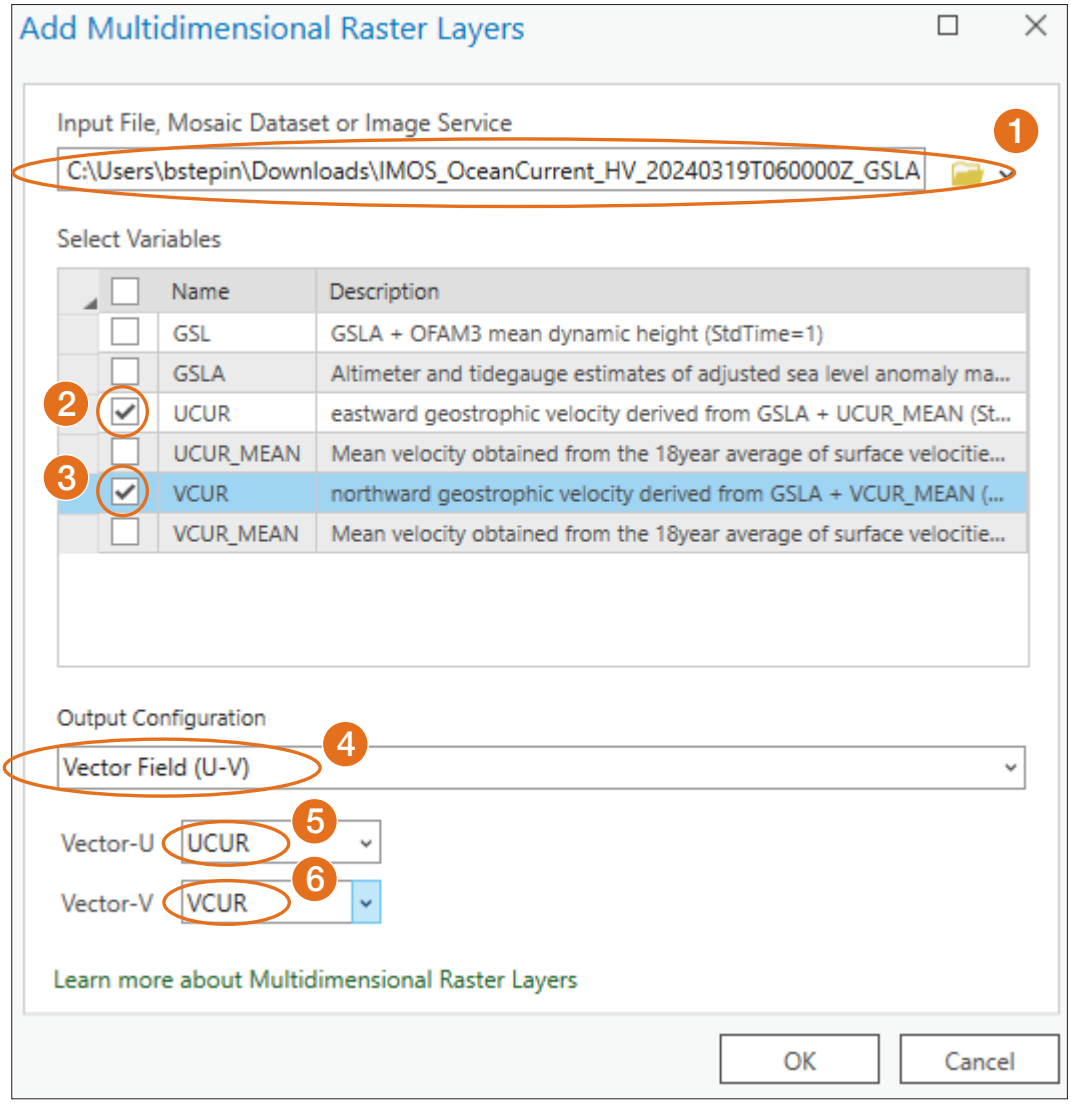
7. Once you have downloaded the file, we can import the vector data into ArcGIS using the multidimensional rastor tool. Click on the ‘Add Data’ down arrow from the layer tab then select ‘Multidimensional Raster Layer’.



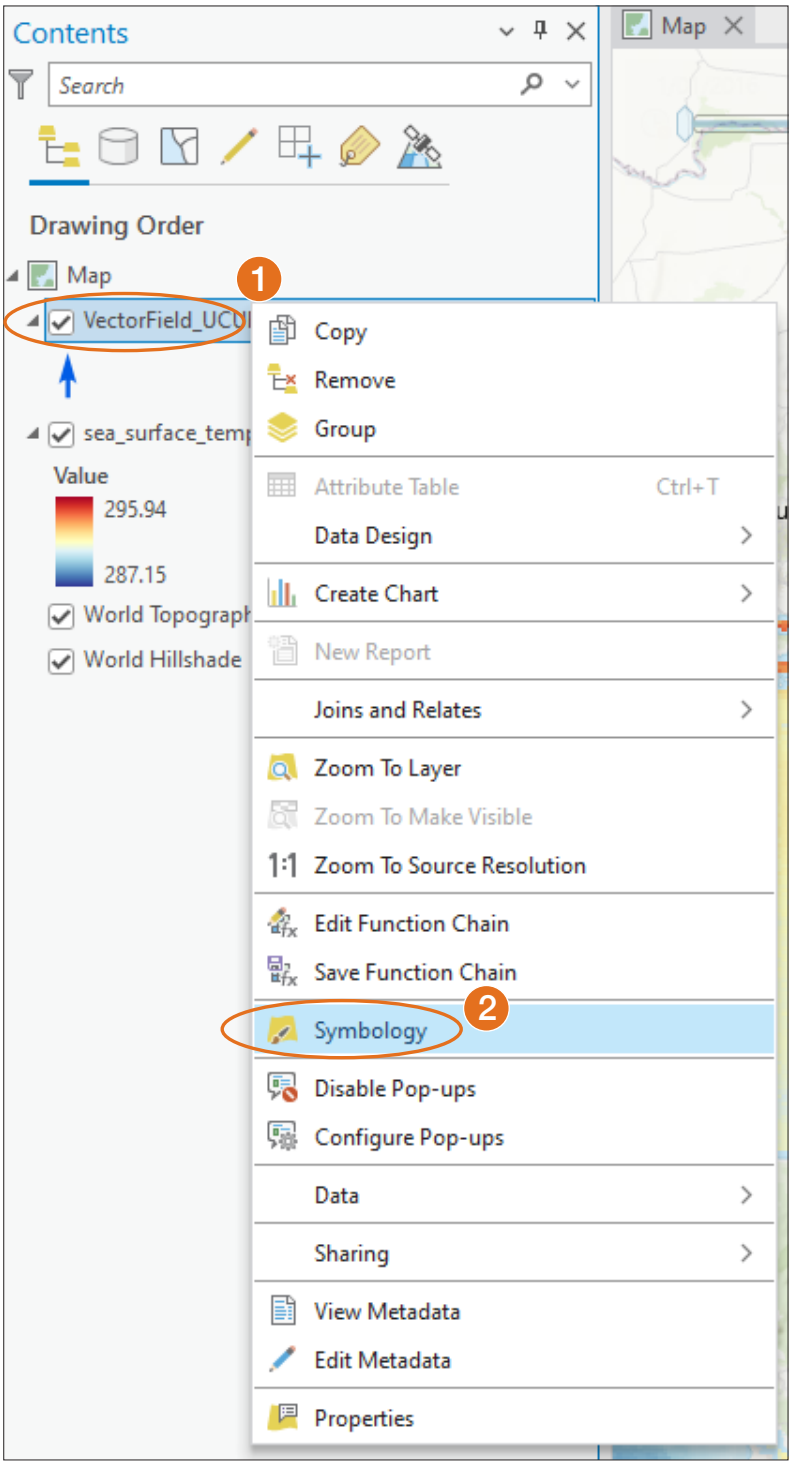
8. In the pop up window, navigate to your downloaded OceanCurrent dataset. Select both the UCUR (Horizontal Velocity) and VCUR (Vertical Velocity) and ArcGIS will determine the direction and magnitude of the two velocities, creating a vector using the basic formula below:

$$|\vec{V}| = \sqrt{U_{\text{cur}}^2 + V_{\text{cur}}^2} \qquad \theta = \arctan\left(\frac{V_{\text{cur}}}{U_{\text{cur}}}\right)$$

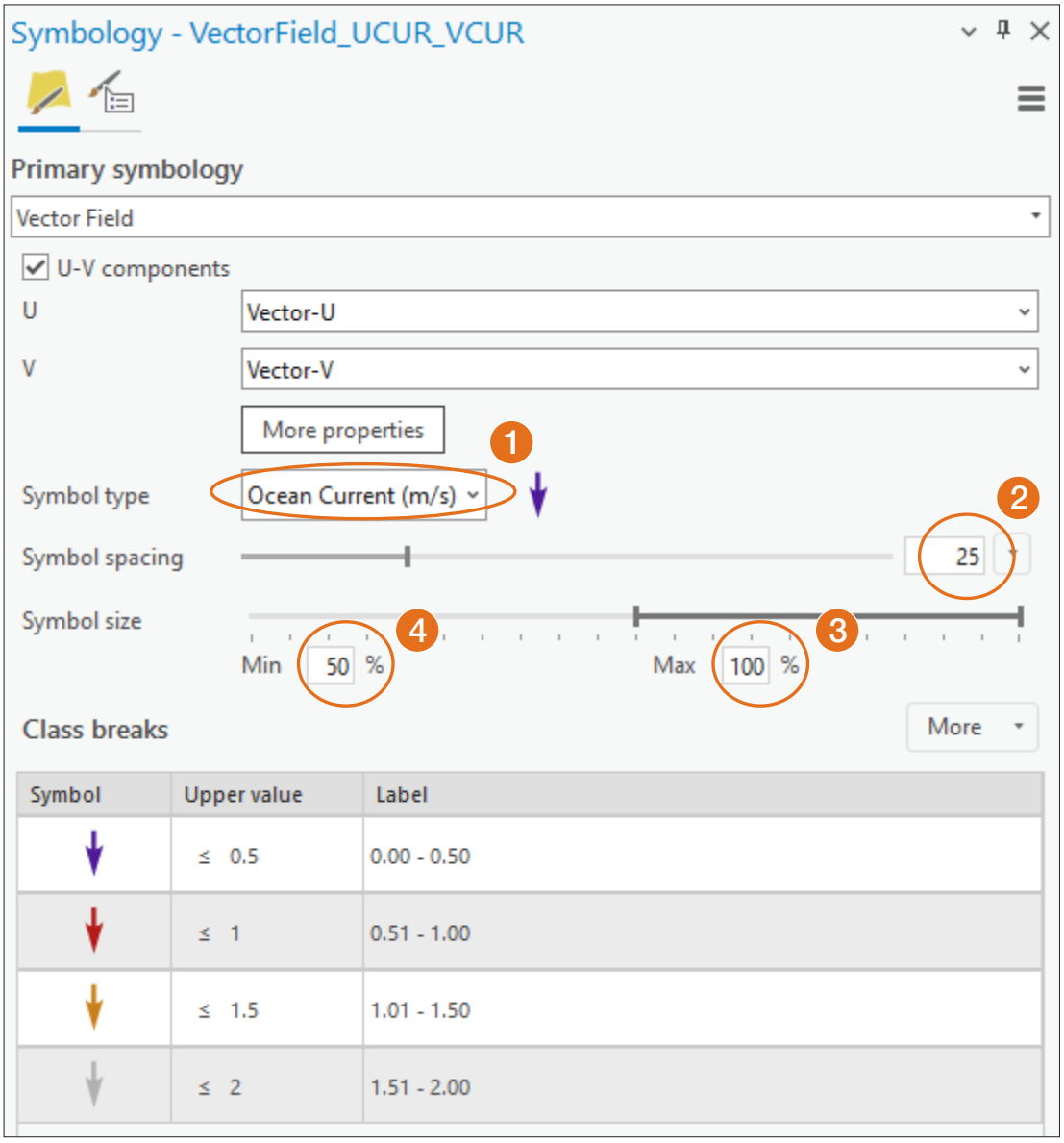




9. Select ‘OK’, and the vector field will be displayed. The standard symbology needs to be adjusted to better represent our vectors. In the contents pane, right click on the layer and select ‘Symbology’.

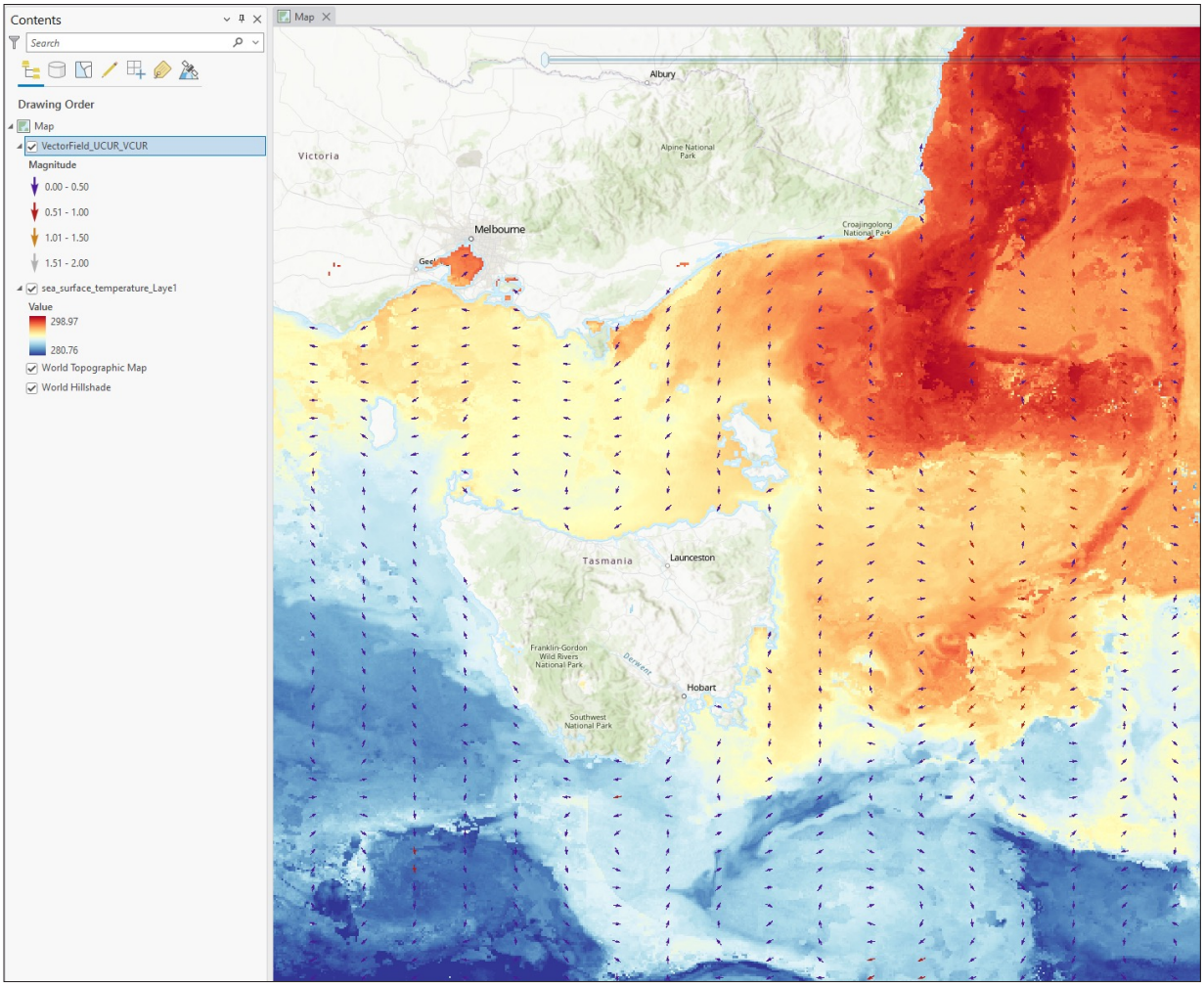


10. The view of the vectors can be adjusted in the symbology window. We recommend changing the spacing to something more fine scale. To do this, select the symbol type to be OceanCurrent (m/s), change the spacing to 25 and set the visibility range to 50-100%.



These values are recommended for this tutorial, and can adjusted to suit your needs.

This should provide an image similar to the one below. This will display the velocity values in colour, indicating the heights and temperatures in Kelvin scale.



FOR MORE RESOURCES

For more Ocean Information Resources, visit **bit.ly/3U0yblZ**

CONTACT US

For more information, please email **info@aodn.org.au**

NCRIS
National Research
Infrastructure for Australia
An Australian Government Initiative

Australia's Integrated Marine Observing System (IMOS) is enabled by the National Collaborative Research Infrastructure Strategy (NCRIS). It is operated by a consortium of institutions as an unincorporated joint venture, with the University of Tasmania as Lead Agent. **www.imos.org.au**

PRINCIPAL PARTICIPANTS

University of Tasmania (Lead Agent)

Australian Government

Australian Institute of Marine Science

Australian Government Bureau of Meteorology

CSIRO

Government of South Australia

SARDI Research and Development Institute

The University of Western Australia

sims sydney institute of marine science

UTS

The University of Sydney

Macquarie University

UNSW Sydney

SIMS is a partnership involving four universities.

ASSOCIATE PARTICIPANTS

Curtin University

Australian Government
Department of Climate Change, Energy, the Environment and Water
Australian Antarctic Division

Australian Antarctic Program

Deakin University

The University of Melbourne

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IMOS acknowledges the Traditional Custodians and Elders of the land and sea on which we work and observe and recognise their unique connection to land and sea. We pay our respects to Aboriginal and Torres Strait Islander peoples past and present.