

Title	NESP Biodiversity Hub Hunter Marine Park Towed Video Imagery
Alternative title(s)	NESP Biodiversity Hub D3 Project: still imagery of the seabed in the Hunter Marine Park
Abstract	Raw downward facing still imagery of the seabed for Hunter Marine Park acquired using NSW Department of Planning Industry and Environment towed video system aboard RV Bombora for the National Environmental Science Program (NESP Biodiversity Hub). Fieldwork was funded, both cash and in-kind, by NSW DPIE and NESP in Year 5 (2019) of the program for 8-10 days of towed video over areas surveyed earlier in the program using a multi-beam echosounder (MBES) in 2015-16 and 2018-19 (NSW DPIE). A report titled 'Mapping and characterising the rocky reef habitat, fish and sessile invertebrate assemblages of the Hunter Marine Park' is available on the NESP website. Sites were randomly selected across mapped areas of the park's inner shelf, >3NM offshore of Seal Rocks, Broughton Island and Outer Gibber and covering depths of ~25-110m. Georeferenced (XYZ) and time-stamped (UTC) still imagery is accessible via DPIE Information Asset Register (IAR) and NSW Sharing and Enabling Environmental Data (SEED) website and linked to the online annotation platform Squidle+.
Resource locator	
Data Quality Statement	Name: Data Quality Statement Protocol: WWW:DOWNLOAD-1.0-http--download Description: Data quality statement for NESP Biodiversity Hub Hunter Marine Park Towed Video Imagery Function: download
Unique resource identifier	
Code	c16ffe39-fb1d-4ace-8a6f-efa73a4939a6
Presentation form	Image digital
Edition	1
Dataset language	English
Metadata standard	
Name	ISO 19115
Edition	2016
Dataset URI	https://datasets.seed.nsw.gov.au/dataset/c16ffe39-fb1d-4ace-8a6f-efa73a4939a6
Purpose	baseline for monitoring
Status	On going
Spatial representation type	video
Spatial reference system	
Code identifying the spatial reference system	4283

Spatial resolution

1 m

Additional information source

Data were collected on 7-9 separate dates during the time period to acquire imagery once from each for the randomly selected locations identified at the start of the survey.

Topic category

Keyword set	
keyword value	MARINE-Biology MARINE-Coasts MARINE-Reefs PHOTOGRAPHY-AND-IMAGERY-Remote-Sensing
Originating controlled vocabulary	
Title	ANZLIC Search Words
Reference date	2008-05-16
Geographic location	
West bounding longitude	152.352905
East bounding longitude	152.653656
North bounding latitude	-32.619714
South bounding latitude	-32.428658
NSW Place Name	Port Stephens Great Lakes Worimi
Vertical extent information	
Minimum value	-100
Maximum value	2228
Coordinate reference system	
Authority code	urn:ogc:def:cs:EPSG::
Code identifying the coordinate reference system	5711
Temporal extent	
Begin position	2019-10-20
End position	N/A
Dataset reference date	
Resource maintenance	
Maintenance and update frequency	Unknown
Contact info	
Contact position	Data Broker
Organisation name	NSW Department of Climate Change, Energy, the Environment and Water
Telephone number	131555
Email address	data.broker@environment.nsw.gov.au
Web address	https://www.nsw.gov.au/departments-and-agencies/dcceew
Responsible party role	pointOfContact

Lineage

Video surveying was undertaken following the recommendations detailed in 'Field Manuals for Marine Sampling to Monitor Australian Waters' (<https://www.nespmarine.edu.au/field-manuals-marine-sampling-monitor-australian-waters>). Details of the NSW DPIE towed video system and equipment are provided in 'SeaBed NSW: Standard Operating Procedures of multibeam surveying' (<https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Research/Our-science-and-research/seabed-nsw-standard-operating-procedures-multibeam-surveying-190101.pdf>). XYZ positional accuracy of the still imagery is better than XY (3 degrees of slant range [eg. 2.6m radius @ 100m]; <1m POS MV GPS G2 and POS to USBL offset) and Z (~0.2m based on USBL and tow-fish camera P-sensor with 0.54m offset). Imagery was obtained during the period 21 October 2019 - 31 October 2020 using a DSLR still camera (Towed Digital Stills - TDS) and forward looking live-feed (fibre) video (Towed Digital Video - TDV). TDS were captured at 2s intervals along 80-90 x 200m transects and characteristically ~1m from the seabed with dual green lasers (spaced 100mm) for measuring seabed distance (horizontal). TDS were re-labelled using NSW DPIE naming convention (NSWDPIE_TDS_NESP_Hunter_Location_Site_transectnumber_Dateyyyymmdd_TimeUTChhmmss). Image (JPG) time-stamping in UTC extracted from associated EXIF (Exchangeable Image File Format) metadata; Transect metadata file (CSV) for each transect contains the following columns: 1) Filename (as above); 2) Timestamp yyyy-mm-dd hh:mm:ss in UTC; 3) Latitude_TDS (Y GPS coordinate of TDS from USBL); 4) Longitude_TDS (X GPS coordinate of TDS from USBL); 5) Depth_TDS (Z stills camera depth in metres = derived from Pressure-sensor on TDV + physical offset TDS to TDV Pressure-sensor (0.54m)); 6) Latitude_Ship (vessel Y coordinate); 6) Longitude_Ship (vessel X coordinate); 7) Sounder_Ship (raw vessel depth sounder output in metres); 8) COG_Ship (vessel heading in degrees); 9) SOG_Ship (vessel speed over ground in knots); 10-12) Roll_SHIP, Pitch_SHIP, Yaw_SHIP of Ship; 13) Depth_USBL (Z offset calculated from USBL transponder to transceiver using slant range); 14) Bearing_USBL (direction from vessel to USBL in degrees); 15) Flag (Numerical data flag of range 1 - 3 indicating source of positional data, method outlined in 'Absolute External Positional Accuracy', NaN = True fish position). Image and image metadata records (generated in csv format) were uploaded to NSW SEED Amazon Web Service for access and annotation in Squidle+.

Limitations on public access

Scope	dataset
DQ Completeness Commission	
Effective date	2020-07-16
Explanation	Water column imagery has been edited out of the dataset provided here but available upon request.
DQ Completeness Omission	
Effective date	2020-07-16
Explanation	Where drop-outs of GPS positioning of the tow fish occurred, an interpolated value was calculated as described in the Lineage statement above. Forward looking video and recorded tow-fish parameters (i.e. roll/pitch/heave) are also available but not provided with this digital still dataset.
DQ Conceptual Consistency	
Effective date	2020-05-18
Explanation	As the imagery is acquired using a moving platform some images may or may not capture part of the same section of seabed in subsequent images. Survey speed of ~1kt (0.51m/s); image capture rate 1 image every 2 seconds; and approximate area of seabed captured in each image (0.5 - 2m ²); 2 laser pointers denote a horizontal distance of 10cm where visible. nb: tow-fish roll, pitch and heave values are recorded by the video camera and saved within the video data file.
DQ Absolute External Positional Accuracy	
Effective date	2020-05-18
Explanation	XY position of fish is determined by relative position of USBL transponder (fish) to transceiver (vessel). GPS position is G2 quality (<0.4-0.5m XYZ in realtime equiv. RTK) and is relative to the vessels Centre of Mass (reference frame 0:0:0) with a 2.4m forward offset (X = -1.5) from transceiver to COM entered in the USBL software (Y = 0). USBL heading offset is checked following each installation (nominally 23 degrees from centreline) and USBL (Tracklink, USA) precision is 3 degrees of slant range value. Original still image time-stamping is synched with computer UTC (<1s) but image naming convention utilises USBL/Video text feed based on POS MV time ss:mm:hh dd:mm:yyyy (UTC) output. The Tracklink USBL system suffers from drop outs (noise, power) for fish positioning and so when dropouts occurred the following protocol was followed when processing and interpolating positioning data: 1. Extract raw USBL data and partition into transects: interpolate (running average) where gaps are <10s: marked as FLAG 1 in the metadata file; 2. Extract GPS and Fish position (and other data) aligned with timestamps for each image (image to USBL time offset <1s); 3. Import ship and fish positions into Arc, then identify outlier points using 4m radius filter for successive USBL fish position fixes; delete values and interpolate (running average) where gap is <10s; mark as FLAG 1 in metadata file. 4. Determine a median and SD of layback for true fish fixes and generate new fish position values over periods of 10s and as calculation of the new fish position relies on the last fish position there is likely to be an increase in positional error for the assumed fish-position over time. To rectify this, we applied an incremental (linear) offset/adjustment to ensure that the end of the 'drop-out' period aligned with next available USBL fish position in the sequence (i.e. when USBL positioning returned); marked as FLAG 3.
DQ Non Quantitative Attribute Correctness	
Effective date	2020-07-16
Explanation	No non-quantitative attributes are provided here

Responsible party

Contact position	Data Broker
Organisation name	NSW Department of Climate Change, Energy, the Environment and Water
Telephone number	131555
Email address	data.broker@environment.nsw.gov.au
Web address	https://www.nsw.gov.au/departments-and-agencies/dcceew
Responsible party role	pointOfContact

Metadata point of contact

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Metadata date 2024-02-26T12:54:41.998014

Metadata language