Title	Inundation Maps for NSW Inland Floodplain Wetlands

Abstract	Under the NSW DPIE-EES Environmental Water Management Program the distribution and extent of inundation is monitored in large inland floodplain wetland assets which are targeted for environmental flow delivery and located in the NSW portion of the Murray-Darling Basin: Gwydir wetlands, Lowbidgee floodplain, Lower Lachlan wetlands, Macquarie Marshes, Barmah-Millewa Forest and Narran Lakes (since 2022-2023). Inundation maps are derived from image observations sourced from the satellite data sources of Landsat (30m pixel) and Sentinel-2 (10m pixel) for the period July 2014-June 2019. Image observations are automatically downloaded by NSW DPIE from the USGS (Unites State Geological Survey's Earth Explorer website (http://earthexplorer.usgs.gov) and the Copernicus Sentinel Open Access Hub (https://scihub.copernicus.eu/dhus/#/home) as orthorectified images. NSW DPIE process these images to standardised surface reflectance (Flood et al. 2013). Image observations with high cloud coverage (>50%) are not considered because they cannot be processed. The inundation mapping procedure is a modified version of Thomas et. al (2015) which is a method to map inundation in vegetated floodplain wetlands using an integrated spectral response to water and vigorous vegetation. From each satellite image observation NSW DPIE-EES automatically generates a water index (Fisher et al. 2016) and the NDVI vegetation index. These indices are used to allocate inundated pixels to classes of open water, mixed water and vegetation, and dense vegetation cover that was inundated (Thomas et al. 2015). A process of pixel recoding is conducted to produce each inundation map. First all inundation classes are merged and allocated a value of one (1) whilst all other pixels are allocated a value of zero (0). Second, ancillary data is then used to identify irrigation infrastructure to do two things: locate inundated pixels within off-river storages (ORS) by recoding to a value of (2) and to remove cropped areas that have similar spectral properties to wetland vegetation by coding the pixels to a value of zero (0). Third, for observation dates affected by cloud shadow, which is often incorrectly detected as water, pixels are manually reclassified as cloud shadow by recoding them to a value of three (3). The final inundation classes are inundated (1), off-river storages with water (ors) (2), cloud shadow (3), and not inundated (0). Final inundation maps are clipped to the inland floodplain wetland boundaries.

The naming format of the files are: Wetland_date _sensor_inundation1_ors2_cloud3.tif or Wetland_path_date _sensor_inundation1_ors2_cloud3.tif

Wetland: bm = Barmah Millewa floodplain gw = Gwydir floodplain lachlan = Lachlan floodplain lo = Lowbidgee floodplain mm = Macquarie Marshes floodplain

Path: Specific to the Lachlan Date: Satellite image date processed Sensor: Sensor type- l7 (Landsat7; l8 (Landsat 8); s2 (Sentinel2) Inundation1: Inundated ors2: Off-River Storage with water cloud3: Cloud shadow (in filename if present)

References: Fisher, A., Flood, N. and Danaher, T. (2016). Comparing Landsat water index methods for automated water classification in eastern Australia. Remote Sensing of Environment, 175, 167-182.

Flood, N., Danaher, T., Gill, T., & Gillingham, S. (2013). An operational scheme for deriving standardised surface reflectance from Landsat TM/ETM+ and SPOT HRG imagery for eastern Australia. Remote Sensing, 5, 83–109.

Thomas, R. F., Kingsford, R. T., Lu, Y., Cox, S. J., Sims, N. C. and Hunter, S. J., (2015). Mapping inundation in the heterogeneous floodplain wetlands of the Macquarie Marshes, using Landsat Thematic Mapper. Journal of Hydrology 524, 194-213.

Resource locator

Data Quality Statement	Name: Data Quality Statement
	Protocol: WWW:DOWNLOAD-1.0-http--download
	Description:
	Data quality statement for Inundation Maps for NSW Inland Floodplain Wetlands
	Function: download
2014-2019 Inundation Maps	Name: 2014-2019 Inundation Maps
	Protocol: WWW:DOWNLOAD-1.0-http--download
	Description:
	Under the NSW DPIE-EES Environmental Water Management Program the

distribution and extent of inundation is monitored in large inland floodplain wetland assets which are targeted for environmental flow delivery and located in the NSW portion of the Murray-Darling Basin: Gwydir wetlands, Lowbidgee floodplain, Lower Lachlan wetlands, Macquarie Marshes, and Barmah-Millewa Forest. Inundation maps are derived from image observations sourced from the satellite data sources of Landsat (30m pixel) and Sentinel-2 (10m pixel) for the period July 2014-June 2019. Image observations are automatically downloaded by NSW DPIE from the USGS (Unites State Geological Survey's Earth Explorer website (http://earthexplorer.usgs.gov) and the Copernicus Sentinel Open Access Hub (https://scihub.copernicus.eu/dhus/#/home) as orthorectified images. NSW DPIE process these images to standardised surface reflectance (Flood et al. 2013). Image observations with high cloud coverage (>50%) are not considered because they cannot be processed. The inundation mapping procedure is a modified version of Thomas et. al (2015) which is a method to map inundation in vegetated floodplain wetlands using an integrated spectral response to water and vigorous vegetation. From each satellite image observation NSW DPIE-EES automatically generates a water index (Fisher et al. 2016) and the NDVI vegetation index. These indices are used to allocate inundated pixels to classes of open water, mixed water and vegetation, and dense vegetation cover that was inundated (Thomas et al. 2015). A process of pixel recoding is conducted to produce each inundation map. First all inundation classes are merged and allocated a value of one (1) whilst all other pixels are allocated a value of zero (0). Second, ancillary data is then used to identify irrigation infrastructure to do two things: locate inundated pixels within off-river storages (ORS) by recoding to a value of (2) and to remove cropped areas that have similar spectral properties to wetland vegetation by coding the pixels to a value of zero (0). Third, for observation dates affected by cloud shadow, which is often incorrectly detected as water, pixels are manually reclassified as cloud shadow by recoding them to a value of three (3). The final inundation classes are inundated (1), off-river storages with water (ors) (2), cloud shadow (3), and not inundated (0). Final inundation maps are clipped to the inland floodplain wetland boundaries.

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Function: download

2019-2021 inundation maps

Name: 2019-2021 inundation maps

Protocol: WWW:DOWNLOAD-1.0-http--download

Description:

Inundation maps are derived from image observations sourced from the satellite data sources of Landsat (30m pixel) and Sentinel-2 (10m pixel) for the period July 2019-June 2021.

Function: download

2021-2022 inundation maps

Name: 2021-2022 inundation maps

Protocol: WWW:DOWNLOAD-1.0-http--download

Description:

Inundation maps are derived from image observations sourced from the satellite data sources of Landsat (30m pixel) and Sentinel-2 (10m pixel) for the period July 2021-June 2022.

Function: download

[2022-2023 inundation maps](#)	Name: 2022-2023 inundation maps
	Protocol: WWW:DOWNLOAD-1.0-http--download
	Description:
	Inundation maps are derived from image observations sourced from the satellite data sources of Landsat (30m pixel) and Sentinel-2 (10m pixel) for the period July 2022-June 2023.
	Function: download
[2023-2024 inundation maps](#)	Name: 2023-2024 inundation maps
	Protocol: WWW:DOWNLOAD-1.0-http--download
	Description:
	Inundation date maps for 2023-2024 water year.
	Function: download

Unique resource identifier

Code	219182a0-02a2-4916-b21c-2e330e65f8de

Presentation form	Map digital

Edition	1

Dataset language	English

Metadata standard

Name	ISO 19115
Edition	2016

Dataset URI	https://datasets.seed.nsw.gov.au/dataset/219182a0-02a2-4916-b21c-2e330e65f8de

Purpose	Inland wetlands and environmental water managment

Status	On going

Spatial representation type	grid

Spatial reference system

Code identifying the spatial reference system	4283

Spatial resolution	30 m

Topic category

Keyword set

keyword value	WATER-Wetlands
	WATER-Surface

Originating controlled vocabulary

Title	ANZLIC Search Words
Reference date	2008-05-16

Geographic location

West bounding longitude	140.888672
East bounding longitude	153.486474
North bounding latitude	-36.326808
South bounding latitude	-28.985844

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	2014-07-01
End position	N/A

Dataset reference date

Resource maintenance

Maintenance and update frequency	Unknown

Contact info

Contact position	Data Broker
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Responsible party role	pointOfContact

Lineage

Inundation maps are derived from image observations sourced from the satellite data sources of Landsat (30m pixel) and Sentinel-2 (10m pixel) for the period July 2014-June 2019. Image observations are automatically downloaded by NSW DPIE from the USGS (Unites State Geological Survey's Earth Explorer website (http://earthexplorer.usgs.gov) and the Copernicus Sentinel Open Access Hub (https://scihub.copernicus.eu/dhus/#/home) as orthorectified images. NSW DPIE process these images to standardised surface reflectance (Flood et al. 2013). Image observations with high cloud coverage (>50%) are not considered because they cannot be processed. The inundation mapping procedure is a modified version of Thomas et. al (2015) which is a method to map inundation in vegetated floodplain wetlands using an integrated spectral response to water and vigorous vegetation. From each satellite image observation NSW DPIE-EES automatically generates a water index (Fisher et al. 2016) and the NDVI vegetation index. These indices are used to allocate inundated pixels to classes of open water, mixed water and vegetation, and dense vegetation cover that was inundated (Thomas et al. 2015). A process of pixel recoding is conducted to produce each inundation map. First all inundation classes are merged and allocated a value of one (1) whilst all other pixels are allocated a value of zero (0). Second, ancillary data is then used to identify irrigation infrastructure to do two things: locate inundated pixels within off-river storages (ORS) by recoding to a value of (2) and to remove cropped areas that have similar spectral properties to wetland vegetation by coding the pixels to a value of zero (0). Third, for observation dates affected by cloud shadow, which is often incorrectly detected as water, pixels are manually reclassified as cloud shadow by recoding them to a value of three (3). The final inundation classes are inundated (1), off-river storages with water (ors) (2), cloud shadow (3), and not inundated (0). Final inundation maps are clipped to the inland floodplain wetland boundaries.

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Limitations on public access

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
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Responsible party role	pointOfContact

Metadata point of contact

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Metadata date

2024-12-16T20:24:12.159883

Metadata language