

ICOLL Entrance Management in NSW – A State Perspective



Opening Lake Illawarra entrance 1937

What are ICOLLS?

- Estuaries with entrances that temporarily become closed off to the sea by the build-up of marine sand



Belongil Creek

Entrance closures can lead to significant community concerns and pressure on Government to intervene



The 'Big Dig' – Lake Illawarra 2002

- Community concerns largely based around mis-conceptions
 - › Amenity issues
 - › Water looks different
 - › Odours
- Illegal and ad hoc openings can have unintended consequences
 - › Fish kills
 - › Release of larger fish
 - › Poor scour and rapid re-closure

Warning on illegal dredging



Why Councils Open ICOLLS

- Mitigating damage / inconvenience to low-lying assets inundated / threatened by rising water
- Community pressure
 - Amenity
 - Water quality problems (often perceived),
 - Enhance fish and prawn recruitment
 - Oyster industries
 - Improve surfing conditions
 - Impacts on business



Entrance Management Options

1. Non intervention – allowing natural openings
2. Artificial opening e.g. only when the water reaches a certain level
3. Maintaining a constant berm height and/or pilot channel
4. Engineering works to create permanent opening
5. Variations on the above



Narrabeen Lagoon

NSW Office of Environment & Heritage **Non - Intervention** Bullengella Lake

- Little foreshore development
- Only minor low cost assets inundated
- Encourages those with minor impacts to adapt
- Still important to formalise



Cuttagee Lake – flooded driveway that residents paddle across for access to their property
(Courtesy Kyran Crane, Bega Council)

NSW Office of Environment & Heritage **Artificial Opening**


- Majority of existing NSW policies
- Specific 'Trigger' water level reached
- Goal of raising trigger level over time
- Other triggers



Narrabeen Lagoon 2006

NSW Office of Environment & Heritage **Maintaining berm height**

- Involves regular mechanical intervention of the berm to keep it at a set level to allow the berm to overtop and break open below that which would cause inundation of assets
- Considered for several estuaries as an option
- Likely to require increased resources and site disturbance



Manly Lagoon pilot channel

NSW Office of Environment & Heritage **Engineering options**


Narrabeen Lagoon ~\$1M

Lake Illawarra ~\$10M



NSW Office of Environment & Heritage **Variations on entrance management**

- Manually closing the berm – limit influx of marine sand once the water has drained out
- Opening to promote a quick closure – issues with odours when water levels low
- Having variation in opening heights – mimic natural variation and allow for periods of wetland inundation



Kianga Lake after entrance opening showing extensive exposure of the estuary bed and rotting algae

NSW Environment, Climate Change & Water **Entrance Management Policies**

- State Govt preference to have formal policy
- Reduces 'Ad hoc' openings
- Communication tool to the public
- Allows full consideration of environmental, social and economic impacts
- Govt funding and technical support under Estuary Management Program



Corunna Lake (NPWS)

What should be considered in the preparation of entrance management policies



Overall purpose and objectives of policy

- Initiate openings to alleviate nuisance flooding
- Establish triggers for openings
- Procedures for entrance operations
- Plan for and accommodate SLR



Durras Lake at 1.8m AHD

Approval Process and Relevant Legislation

- ICOLL openings for flood mitigation by public authorities considered development permitted without consent under the Infrastructure SEPP
- Requirements of Environmental Planning and Assessment Act still need to be met
 - Considering environmental impacts
 - Appropriate level of environmental assessment (REF)
- Need for other relevant permits and licences

Relevant Permits & Approvals

Relevant Act	Approvals Required	Approval Body
Crown Lands Act 1989	Approval to carry out activities on Crown Land	Department of Lands
NSW Fisheries Management Act 1994	Permit for destruction of marine vegetation, if applicable Permit for dredging and reclamation*	DPI (NSW Fisheries)
Threatened Species Conservation Act 1995	Impact threatened species (Section 91, if applicable)	OEH
National Parks and Wildlife Act 1974	Damage to Aboriginal object or place (Section 90, if applicable)	OEH (NPWS)
Marine Parks Act 1997	Approval to carry out works in the Marine Park	Marine Park Authority

*Dredging permit under section 200 of the FM Act 1994 not required as long as dredging has been authorised under the Crown Lands Act and the Department of Lands consults with NSW Fisheries prior to authorising

Environmental impacts

Impacts of artificial entrance management can be both **short** and long term:

- Disruption and/or loss of threatened species habitat e.g. Little Terns
- Fish kills
- Damage to dune / estuarine vegetation from machinery



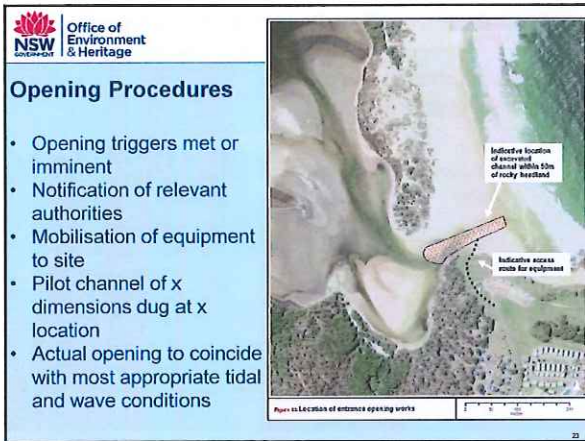
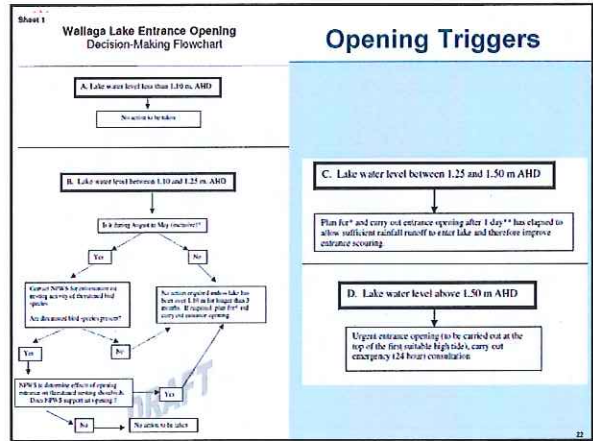
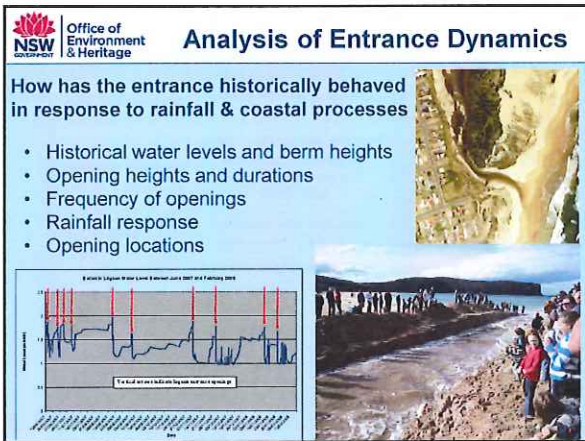
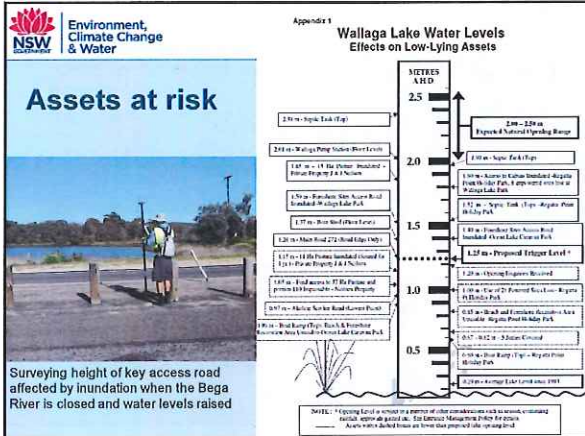
Environmental impacts

Impacts of artificial entrance management can be both short and **long** term:

- Reduction in fringing wetlands
- Marinisation through increased open conditions
- Fish community changes
- Increased sand shoaling and reduced opening durations



Mangrove expansion into saltmarsh



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Recording and Monitoring

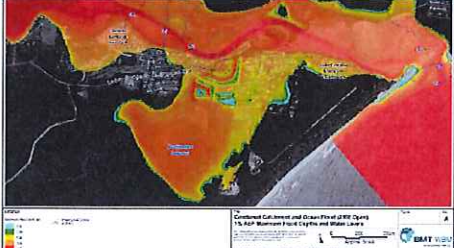
Opening Date	Natural (N) or Artificial (A)	Height of Dune	Location of Breach	Lake Water Level	Time	Length	Channel Width	Depth
Initial Breach								
Ongoing Channel Development								
Full Breakout								
Final Dimensions								
Closing Date: _____								
Wave height/direction: _____				Preceding rainfall: _____				
Wind strength/direction: _____								

24

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Floodplain Management

- Informing entrance management policies through flood studies / plans
- Identifying the best options to alleviate flooding, which may or may not include entrance management

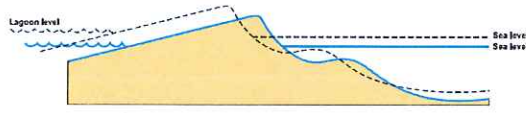


25

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Impacts of SLR

- Higher berm levels
- Higher mean water levels
- Current triggers will be reached quicker, more frequent openings required
- Less efficient scour at current triggers
- Eventually current triggers could be reached by spring tides (opened) and mean water levels (closed)



Shoreline response to increasing sea level (Source: Hanslow et al, 2000)

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Actions to Minimise Intervention & Adapt to SLR

- Opportunistic raising, removal and flood proofing of affected assets
- Raising minimum floor levels for new development
- Revise and update trigger levels after necessary works
- Vertical and horizontal development buffers



Mummaga Lake (T. Baxter, OEH)

27

NSW Environment, Climate Change & Water

Community Consultation & Education

Action condemned

Dee Why Lagoon

breaking the bar

the natural way

medium barrier break

break the bar

medium barrier break

break the bar


medium barrier break

28

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Thank You

Danny Wiecek
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29

