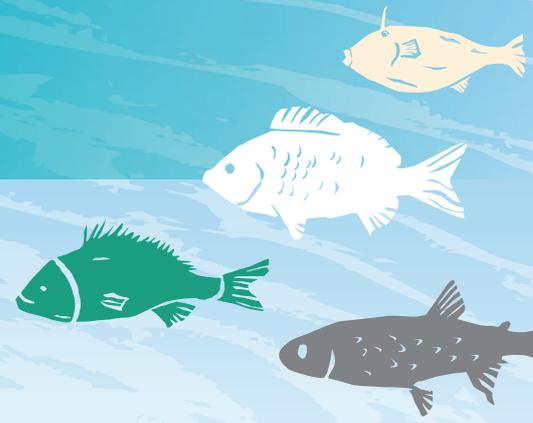


Event Monitoring



1. Why do we record estuary events?

Monitoring of irregular events will tell us a lot about the health of our estuaries and will help to gain a better idea of the processes occurring within them. Event monitoring occurs outside the regular mouth condition and physico-chemical monitoring sessions and records significant events which may impact on the health of estuaries. These observations can be compared with the longer-term mouth condition or physico-chemical data that we collect and can help us to interpret the effect these events have on the estuary system over time.

EstuaryWatch event monitoring can consist of recording anything unusual, including, but not limited to the following: openings of the estuary mouth (both artificial and natural) as well as closings, fish kill events, significant weather events and algal blooms. A more detailed description of each of these events is listed below.



Figure 1. An example of an estuary event. A permitted artificial opening of the Aire River estuary mouth.

2. Methods

Location and Timing

- Event monitoring is used to record irregular events outside the usual monitoring regime. Therefore it will be up to EstuaryWatchers who live in the area surrounding the estuary or frequent the area regularly to record any events as they are observed.
- More care should be taken when monitoring irregular events as unusual weather conditions may compromise access or safety at a monitoring site. If at any point, safety is not assured whilst undertaking monitoring, the EstuaryWatch monitor should cease monitoring immediately and leave the site in a safe manner
- Uploading your information to the EstuaryWatch online database (EWOD) as quickly as possible is important, as is contacting your EstuaryWatch Coordinator or appropriate authority by phone if the event poses a significant threat to the estuarine environment or people.
- Upload your monitoring data sheet (that you took at the event) to the EWOD, make sure to write down a few details of the event in the notes section. There is also a section on the EWOD specifically designed for entering event monitoring information. This is where you should enter any extra information and photos you gathered and make a note if any data sheets have been uploaded that are relevant to the event.

Equipment

- mouth condition and/or physico-chemical monitoring data sheet or notepad (notepad provided with this Manual)
- Camera.

Event Monitoring

Information to record

Information on estuary events is very important, so anything you record will be valuable. Filling out the EstuaryWatch monitoring sheets with the usual data collected is ideal and then write in the notes section of the data sheet or on a notepad anything additional that is unusual. This will enable us to capture as much information as possible. If you are able, take photos of the event as these can provide a great deal of information about the event and conditions in the estuary at the time.

If you do not have the time, or are prevented from completing normal monitoring (eg. severe weather), take what data measurements you can and fill these out in the data sheet whilst also detailing the event that occurred. The sections below provide more detail on specific types of events and what sort of information could be recorded.

Estuary mouth opening event

The state of the estuary mouth has a significant influence on estuarine processes which is why it forms a core part of EstuaryWatch monitoring. Because of the significant impact it can have on water quality parameters it's extremely useful if we have a record of opening events that occur in between our regular monitoring sessions.

Estuary mouths can be opened to the sea through a number of means. Management agencies often undertake artificial openings with approval, usually to reduce the risk of inundation of assets such as houses, jetties and boardwalks. Estuary mouths are sometimes opened illegally which can have a number of detrimental effects on the health of the system. Additionally, estuaries can open naturally to the ocean when freshwater inflows from upstream break through the sand berm at the entrance or when other processes remove sediment from the estuary mouth.

If you observe an estuary mouth opening event record the following information:

- date and time of the observation
- photos of the estuary mouth (same method as for regular mouth condition monitoring)
- type of opening event (permitted/illegal/natural) if known
- presence of any flow and its direction (in or out)
- tide
- water level height at the appropriate gauge board
- sea state and wind direction.



Figure 2. An example of an estuary event. Water levels inundate parts of Aireys Inlet township during a 50 year flood of the Painkalac Creek estuary.

Estuary mouth closing event

Like mouth opening events it's important that we have a record of when the estuary mouth closes to the ocean. The mouths of estuaries can close when sand and sediment is deposited at the entrance or when fresh water inflows are reduced.

If you observe a closing event record the following information:

- the date and time of the observation
- photos of the estuary mouth (same method as for regular mouth condition monitoring)
- the water level height at the appropriate gauge board
- tide
- sea state and wind direction.



Weather event

Weather events such as heavy rainfall, flooding events and storm surges can dramatically alter the structure of estuaries and damage infrastructure. If a significant weather event is observed try and record the following information (if safe to do so):

Flooding event

- extent of any flooding, especially the impact on infrastructure such as jetties, boardwalks and adjoining properties
- water level height at the appropriate gauge board
- photos of any significant changes as a result of flooding e.g. increase in stream pollution.

Storm surge event

- total daily rainfall (see bureau of meteorology website)
- sea state description
- water level height at the appropriate gauge board
- wind direction and strength using the Beaufort scale
- tidal range
- photos of the estuary mouth (same method as for regular mouth condition monitoring)
- photos of any significant changes as a result of storm surge e.g. beach erosion or interesting flotsam and jetsam.

High rainfall event

- total daily rainfall (see bureau of meteorology website)
- water level height at the appropriate gauge board.

Fish death event

Large-scale fish deaths can occur for a number of reasons including low oxygen levels and naturally occurring low pH events. The presence of a fish kill may indicate a dramatic change in estuary conditions. If a fish death event is observed record the following information:

- location of any dead fish found
- estimate of the number of fish found
- estimate of size range of fish found
- species of fish found (if known)
- any unusual smells, water colouration or the presence of recently dumped rubbish.

Algal bloom

Algal blooms most commonly occur in estuaries when a combination of warm, calm and stratified conditions coincides with elevated nutrient levels in an estuary. While algal blooms can occur naturally, there are several algal species which can have a detrimental effect on estuary ecosystems. If an algal bloom is observed record the following information:

- estimate the area it covers
- the colour of the bloom
- any unusual smells.

Miscellaneous

If the event is of a different nature to the ones listed above, record anything you see that could be of relevance to the event and would be of assistance if management action needs to be taken.