Terrigal Water Quality Audit

A collaboration between NSW Government and Central Coast Council

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Objective: To identify sources of pollution to Terrigal Bay and prioritise for remediation
How does cross contamination of stormwater and sewage occur?
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Which drains?

Water quality monitoring, confirm human or otherwise

Identify priority source catchments in drainage

Flow meters and automonitors

Determine the amount of various types of pollution being generated – wet and dry

Identify high risk sources

Receive water models, sediment analyses, interval loads

What risk do the various sources pose to swimming water quality – wet and dry

Identify sites for repair

CBA for repair program

Undertake Repairs

Monitor to ensure values are being protected

Greater risk to values?

Remove the high risk sources first

Which drains have highest concentrations of pollutants to receiving waters – wet and dry

Genetic Assay R&D

Confirm human or otherwise

Identify priority drains

Where in the drainage network are those concentrations originating – wet and dry, including alternative potential sources such as sediments

NSW GOVERNMENT

AUDIT STRUCTURE

Common Purpose

Information Flow

Reporting

CCC primary responsibility

DPIE-ES primary responsibility

Joint responsibility
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Part 1 – Which drains are contributing the most contamination, are microbes of human origin?

Mel will talk about Council’s work using enterococci to identify drains of concern

DNA report not yet available, Minister will decide on release in the near future
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Part 2 – Risk to values

RISK: is about the AMOUNT of the pollutants (microbes or chemicals) and the MIXING at site of discharge (will it stay around or get swept away.

The AMOUNT is combination of
• the concentrations of the pollutant in water
• volume of water

WATER VOLUME
There is an existing estuary health program in the Central Coast estuaries fund by CCC DPIE – Science Division does the sampling associated with that program.

The program has been expanded to provide more information on threats to recreational water quality in lagoons; and more detailed information on status and threats to lagoon estuary health.

Salinity, temperature, turbidity, pH, chlorophyll a, nutrients, bird presence/absence, seagrass and macroalgae fringing vegetation visual assessment.

Enterococci sample, DNA genomic sample, coliscan E. coli sample.
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HOW FAR DOES THE POLLUTION GO?

These data immediately after a 40mm rainfall event.
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WATER MOVEMENT AND MIXING MODEL

This is the area that the model operates over – Box Head to just south of The Entrance and 15 km to sea.

This version shows typical influence of tides, winds using data from Nov 2012 and lagoon opening from 2019
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WATER MOVEMENT AND MIXING MODEL

Next steps will be to bring in:

- Waves
- Local scale mixing (from our instrument data)
- Vertical mixing (helps understand resuspension processes)

- Conductivity and temperature
- Current strength and direction
- Turbidity
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Part 2 – Other pollutants

Sediment and Water Sampling

Bay sediments: samples for enterococci, DNA, sediment size, organic carbon, metals, pesticides, hydrocarbons, micro plastics.

Bay water quality: Chlorophyll a sample, nutrient samples, enterococci sample, DNA sample, salinity, temperature, oxygen, pH. Samples as above also taken from any flowing drains in Haven and near rockpool
Algae

Plants
Conclusions

- DPIE and CCC collaborating well
- CCC has lead on measuring enterococci
- Confirmation of source using DNA is still pending
- Work to measure loads/volumes is about to commence
- Existing lagoon estuary health sampling has been expanded as part of this project
- Terrigal risk assessment model development has started
- Sampling of sediments and water for other pollutants has commenced
- Commencing working with CCC to locate wet weather sources in drainage catchments of Terrigal Bay and lagoons