



A method for determining environmental water requirements of Victoria's estuaries

Background

- 2004 Water Act revisions
- Environmental Water Reserve
 - Definition : *'Share of water set aside to maintain the environmental values of a water system and other water services dependent on the environmental condition of the system'*
- Caps in place
- EWR may not be adequate initially
 - May need enhancement

Environmental flows

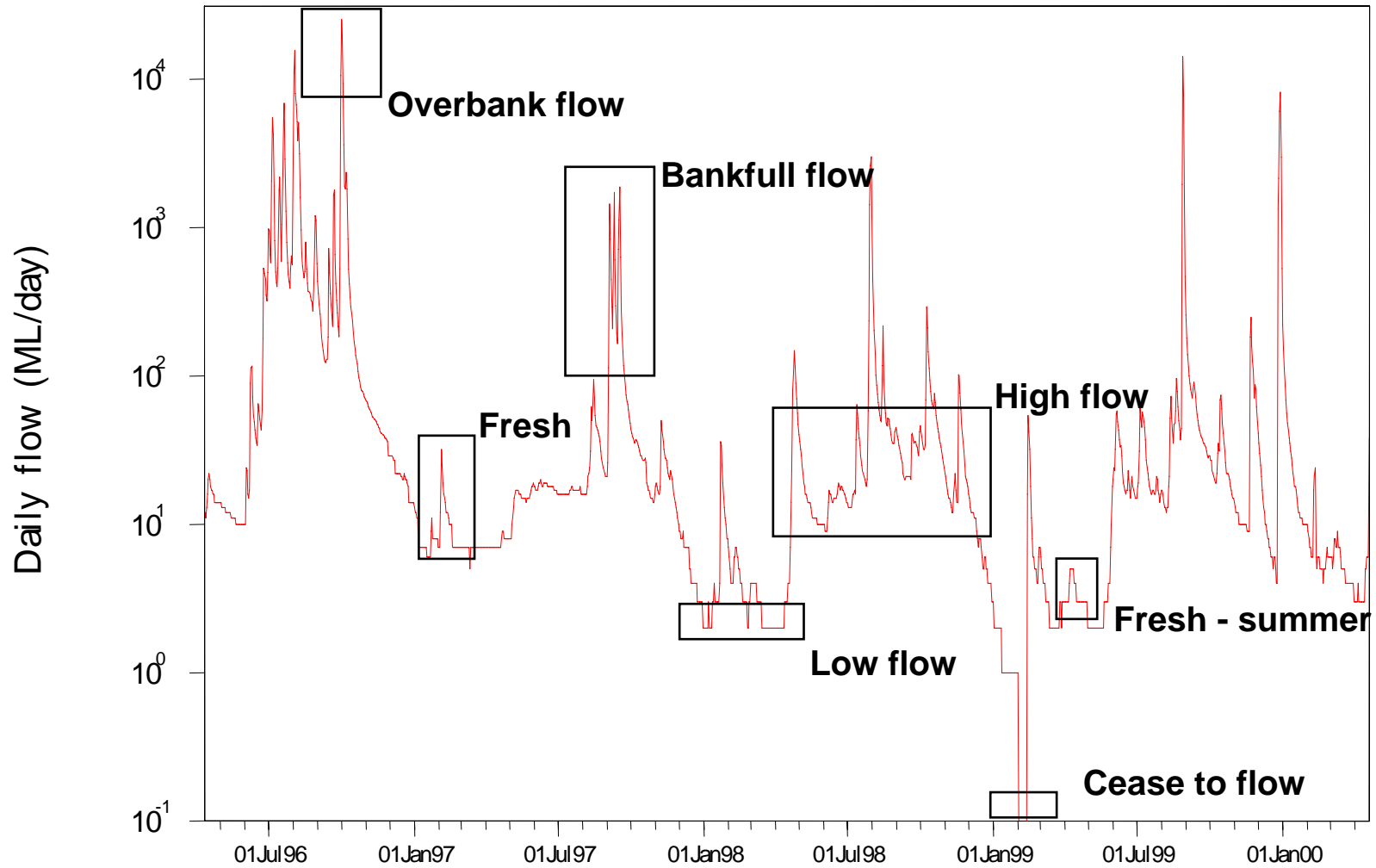
- FLOWS – standard methodology for Victorian *Rivers*
- Extensively used in water allocation
- Limited consideration of estuary req's
- Where we have:
 - Most are qualitative
 - No standard approach
 - No minimum data requirements
 - Limited peer review
 - Repeatability?

Relevance of FLOWs to an estuary method

- *Multi-disciplinary* technical panel
- *Systematic approach* and Specific *minimum data* requirements
- Specific environmental *flow objectives* for assets
- *Flexible* modular method – accommodates variations / additions
- Involves *community* input
- Holistic approach - entire *flow regime*

Flow components

Daily flow series - Coonoor Bridge



Objective of project

- Develop method to assess environmental flow requirements of estuaries that can be applied state wide
- Pilot study on 2 estuaries
- Focus on single estuaries, not bays. They will have own studies due to size, complexity and issues

Challenges during development of method- the workshop

- Freshwater ecologist, hydrodynamicists, hydrologists, wetlands ecologists, estuarine ecologists, fish ecologists, coastal geomorphologists and other gistssss..... talked collectively about their expertise, however challenge is synthesizing this into a practical understanding of affect of freshwater inflows on estuaries.

The '...ologists'



Challenges - data requirements

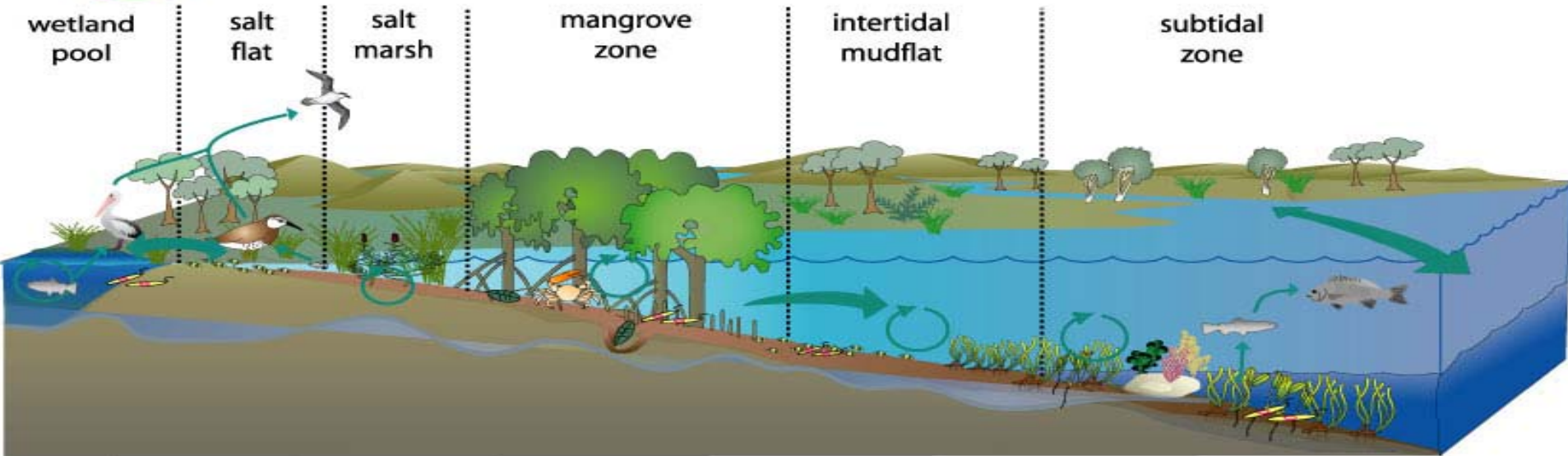
- Equivalent known relationships to FLOWs
 - Eg. 40 cm depth for blackfish, using HecRas
 - Paucity of current knowledge of relationships in Vic estuaries
- 2 – dimensional model - vertical and longitudinal relationships
 - Eg. locate salt wedge
- Bathymetric Survey
 - To understand longitudinal and lateral flow patterns
- Hydrology
 - Current vs. natural

Challenges - Conceptual Models

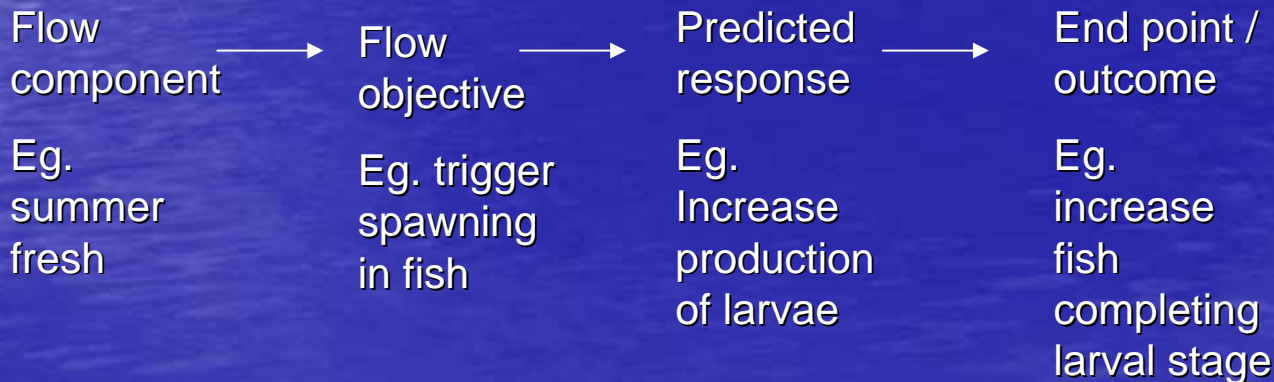


Food Webs

DRAFT



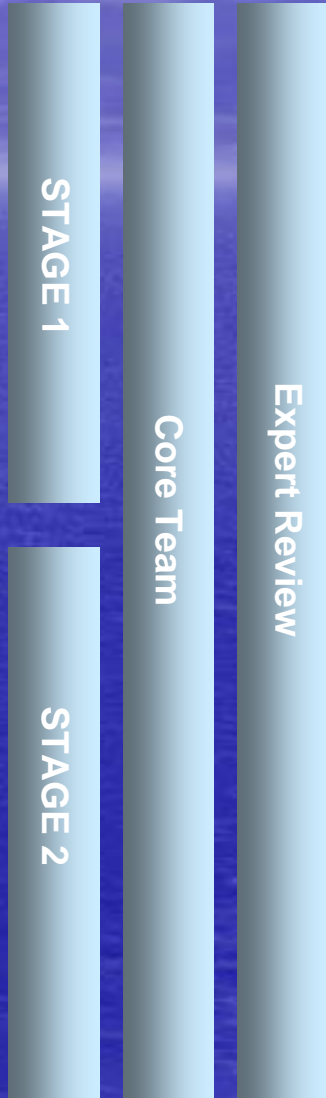
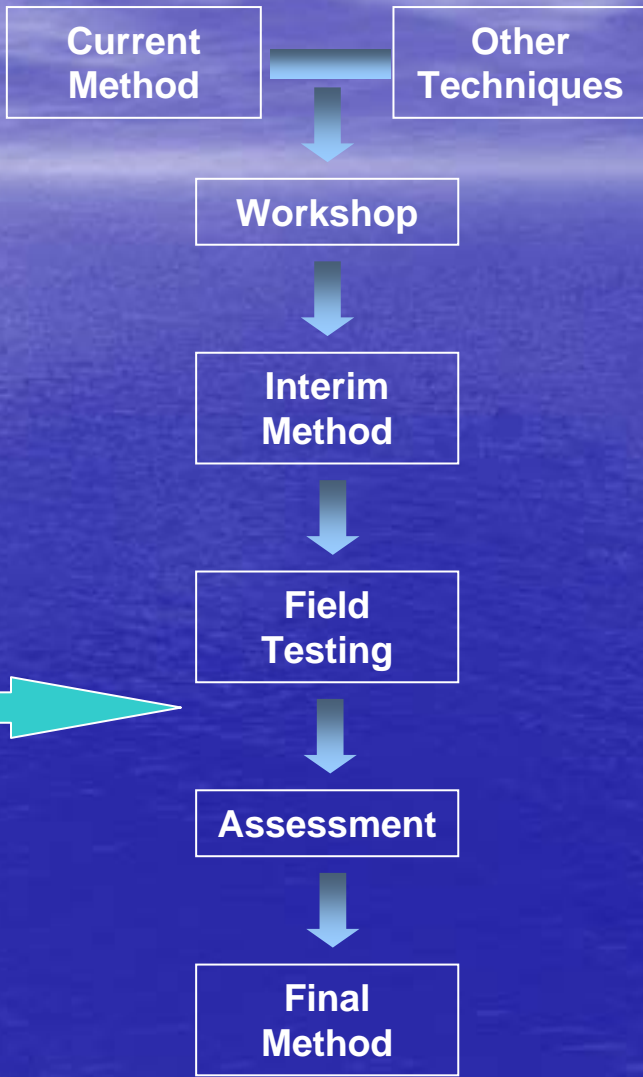
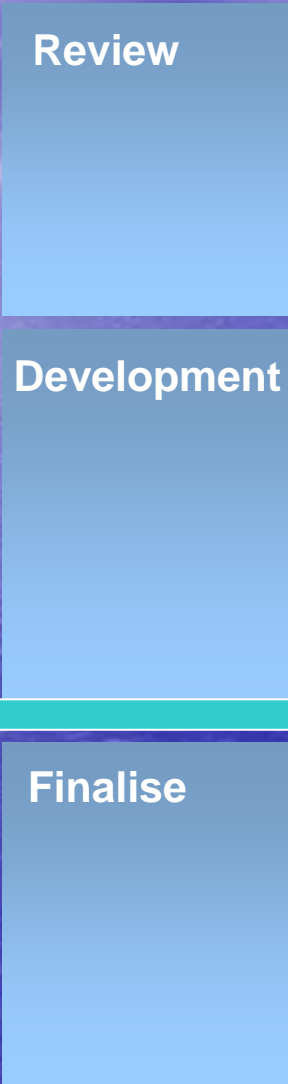
Maintain / enhance native fish community structure



Challenges for river health policy makers

- Understanding estuaries, it's a different way of thinking
- Studying estuaries is expensive
- Understanding in it's infancy (10 years of e-flow methods in Vic. rivers before FLOWS)
- Method for addressing both water recovery and water demand scenarios
- Community understanding
- Getting answers that make sense for an estuary, where a FLOWS study has been completed

Process



We are here



Pilot Studies

- Werribee River
 - Permanently open estuary mouth
 - Highly regulated catchment hydrology
 - Highly degraded river system
- Gellibrand River
 - Intermittently closed estuary mouth
 - Relatively unregulated catchment hydrology
 - Very close to ecologically healthy





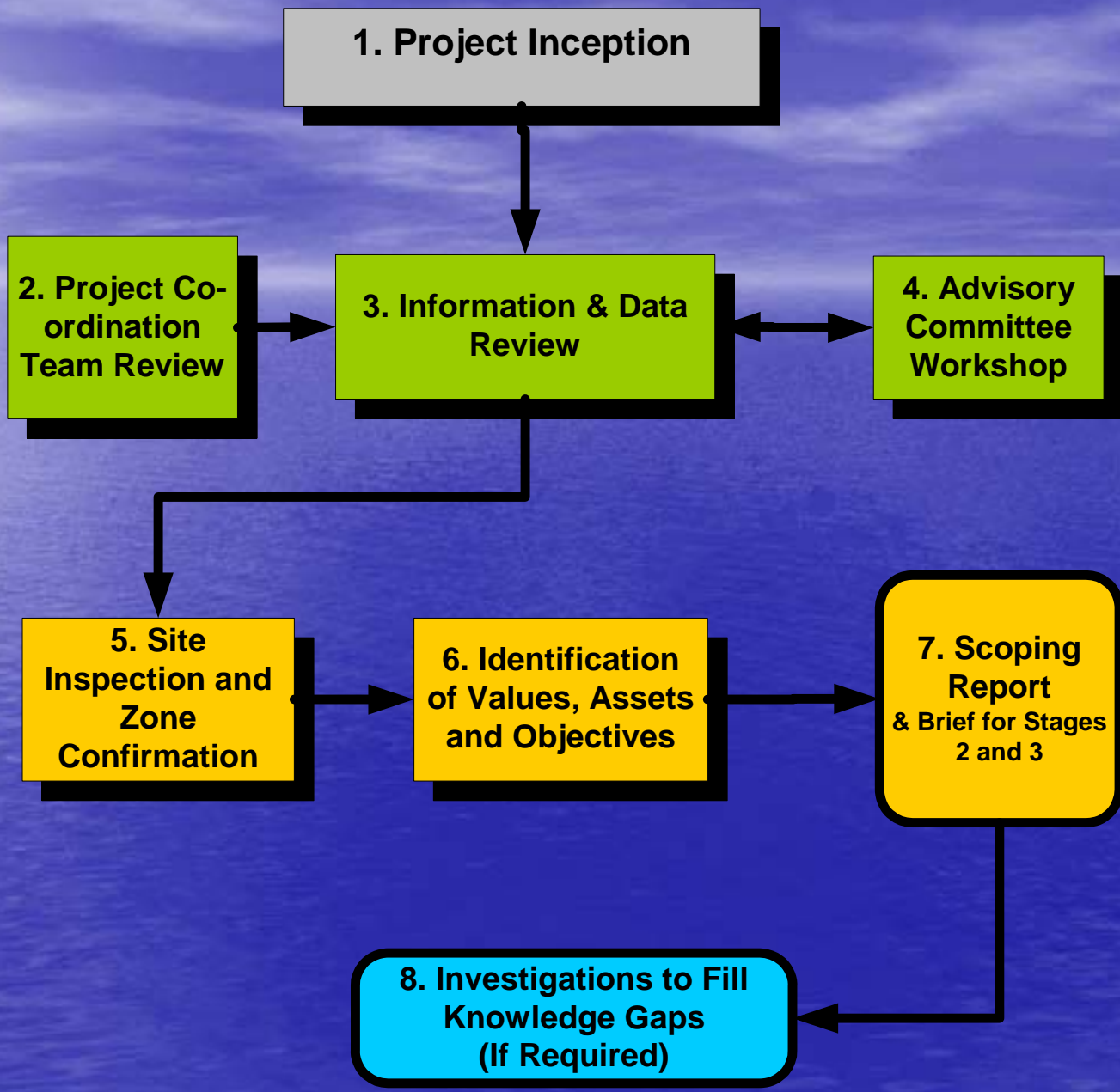


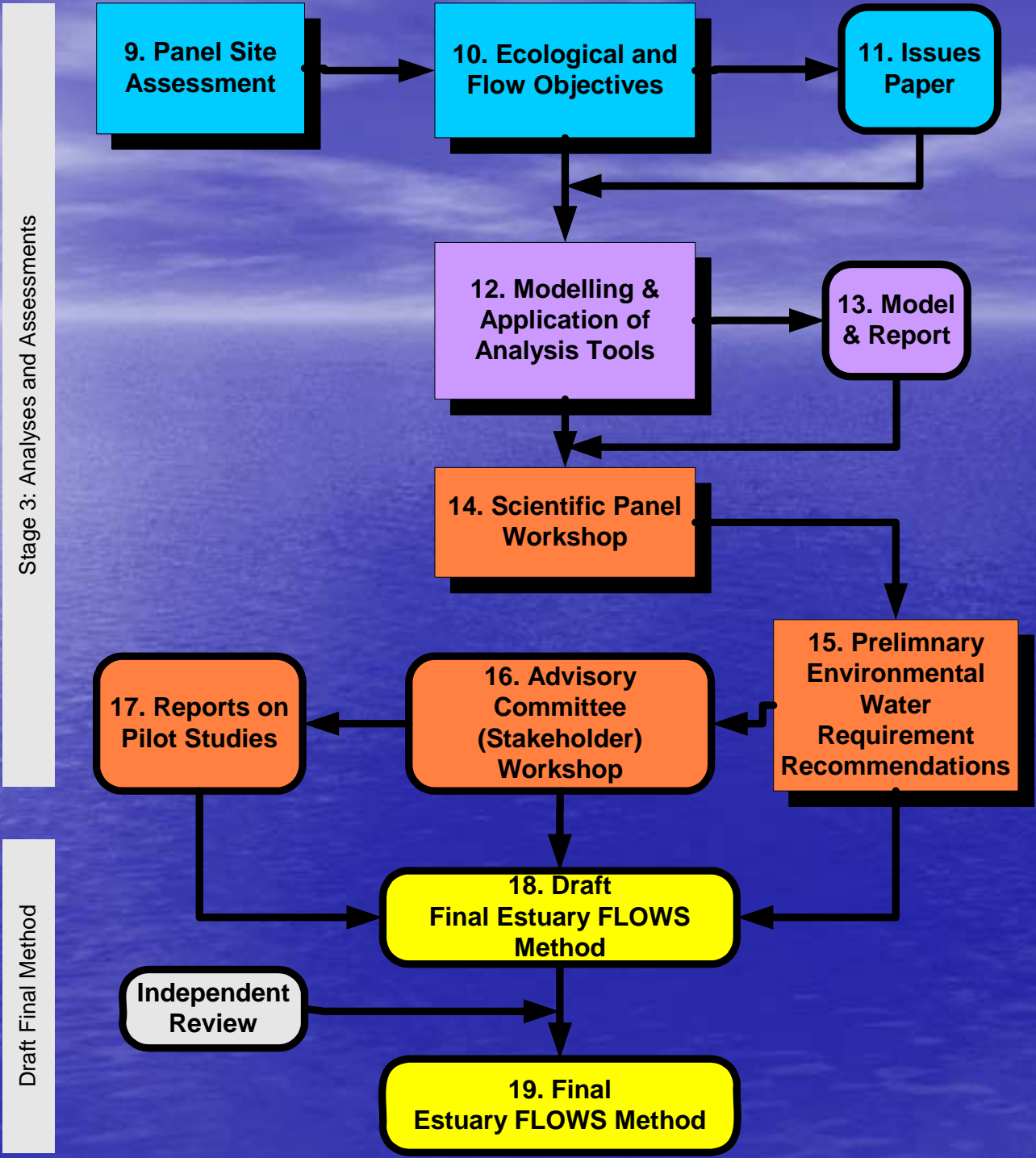




Stage 1: Project Scoping

Stage 2:
Data Collection





Next Steps

- Expert panel workshop
- Preparation of recommendations report for each estuary
- Expert review by:
 - Professor Angela Arthrington
 - Dr Bill Peirson
- Preparation of final methodology report
 - Expert review

Next steps

- Application of the method to priority estuaries
- Tradeoffs between managing water for river or estuary (do the estuary needs drive water recover?)

Thank You

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