



River health assessment in Australia: a national approach

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For the National Water
Commission & the
National Water Initiative

Assessing rivers in Australia is not necessarily straightforward

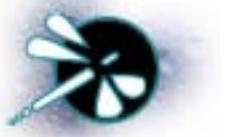


Crikey, I'm not sampling here – special problems in some places



Background

- Recognition that rivers are degraded & being used unsustainably
- National Water Initiative established with \$2B to return rivers to *environmentally-sustainable levels of use*
- National decisions need national data but differences in existing state programs need to be incorporated



Objectives

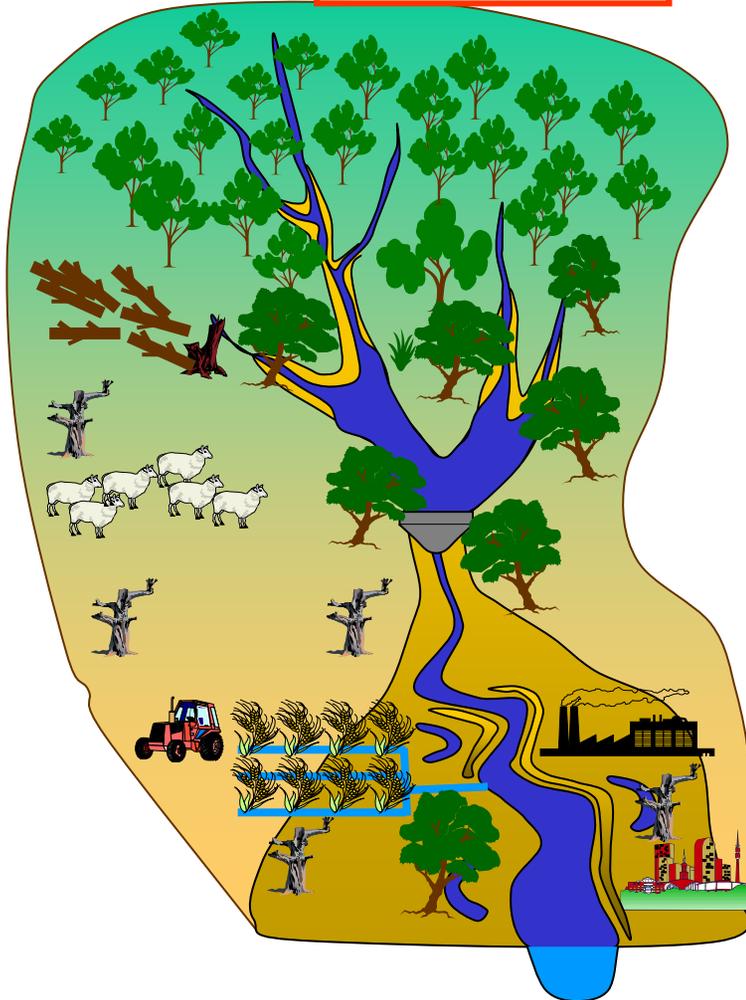
- To report areas of high conservation value
- To report on rivers with environmental flow guidelines & assessment
- To develop a framework that can be used by all jurisdictions to report on river health nationally.
- To create an Assessment of River Health that incorporates attributes indicating key ecological processes.

Conceptual model

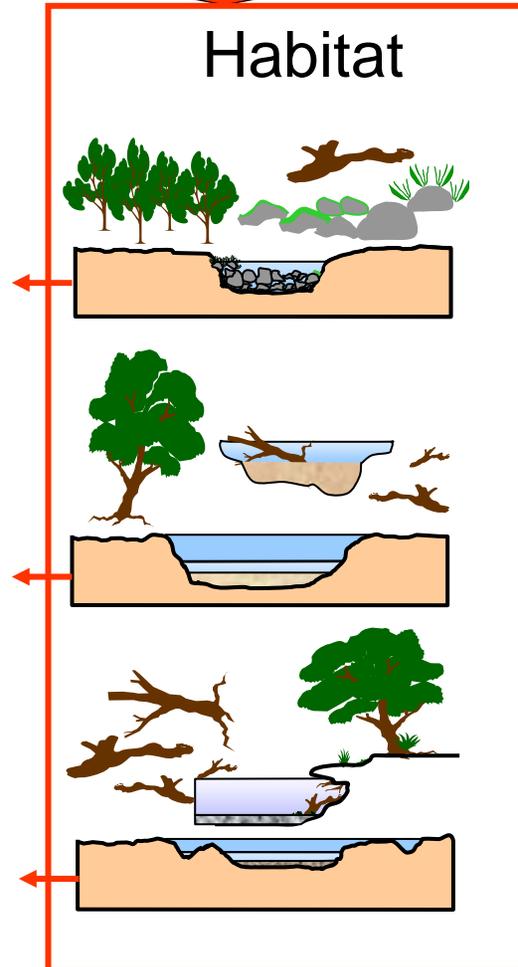
ARC_E (environment)

ARC_B
(Biota)

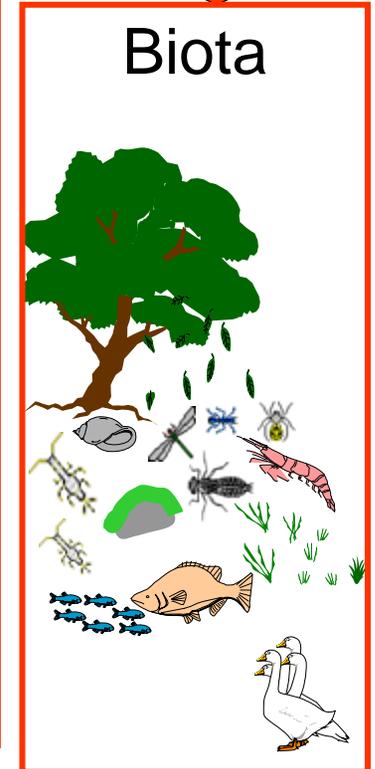
Catchment

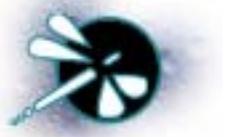


Habitat



Biota





The framework

- Indices representing
 - Catchment – land use, hydrology
 - Habitat – channel, sediment, water quality, riparian
 - Biota – invertebrates, fish, riparian vegetation
- Data sources modeled & measured
- Reference condition for each index
- Range standardized & linear
- Validated – finer scale, other methods
- Scale of measurement reach based & reporting at reach & larger scales

Integration & bands of condition



Good



Fair

Riparian veg lost



Poor

**Little riparian veg
grazing, cropping**



Very Poor
Flow regulation



Existing similar programs

- Tasmania – measured & modeled data covering all components & all river links with 25m DEM
- Victoria – measured data at reach scale, selected reaches, no catchment condition
- Murray-Darling Basin, 4 states, 1 territory – measured data, stratified random, not fully implemented
- Comparison with existing programs to ensure alternate indices provide comparable assessments

Comparison, Victoria & 1st National Audit



ISC

- Hydrology
- Streamside zone
- Physical form
- Water quality
- Aquatic life
- Reach scale
- Measured on transects within reach

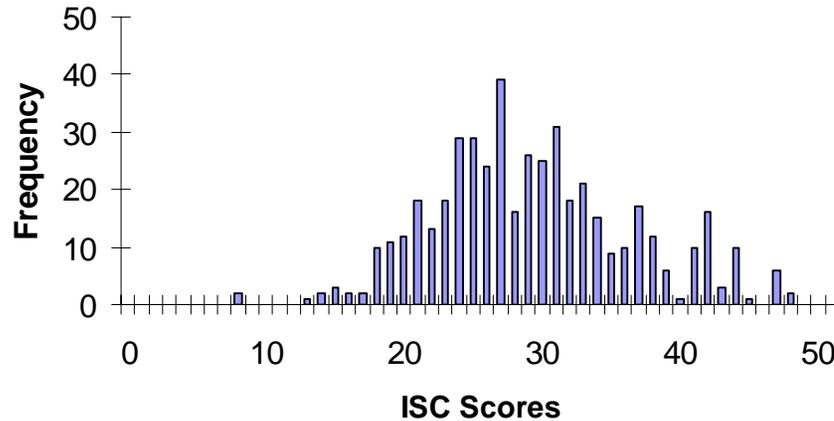
ARC

- Catchment condition
- Hydrology
- Habitat
- Water quality
- Biota – kept separate
- Reach scale
- Measured, modeled, remote sensed data, reach scale

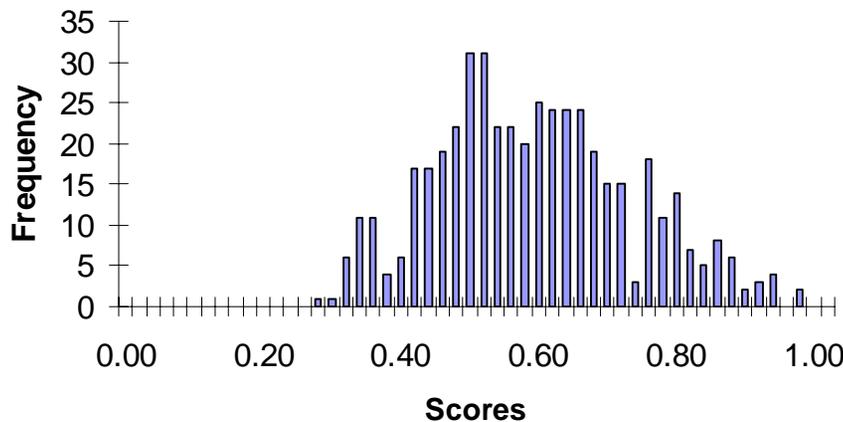
Large-scale comparison 470 reaches



A. ISC

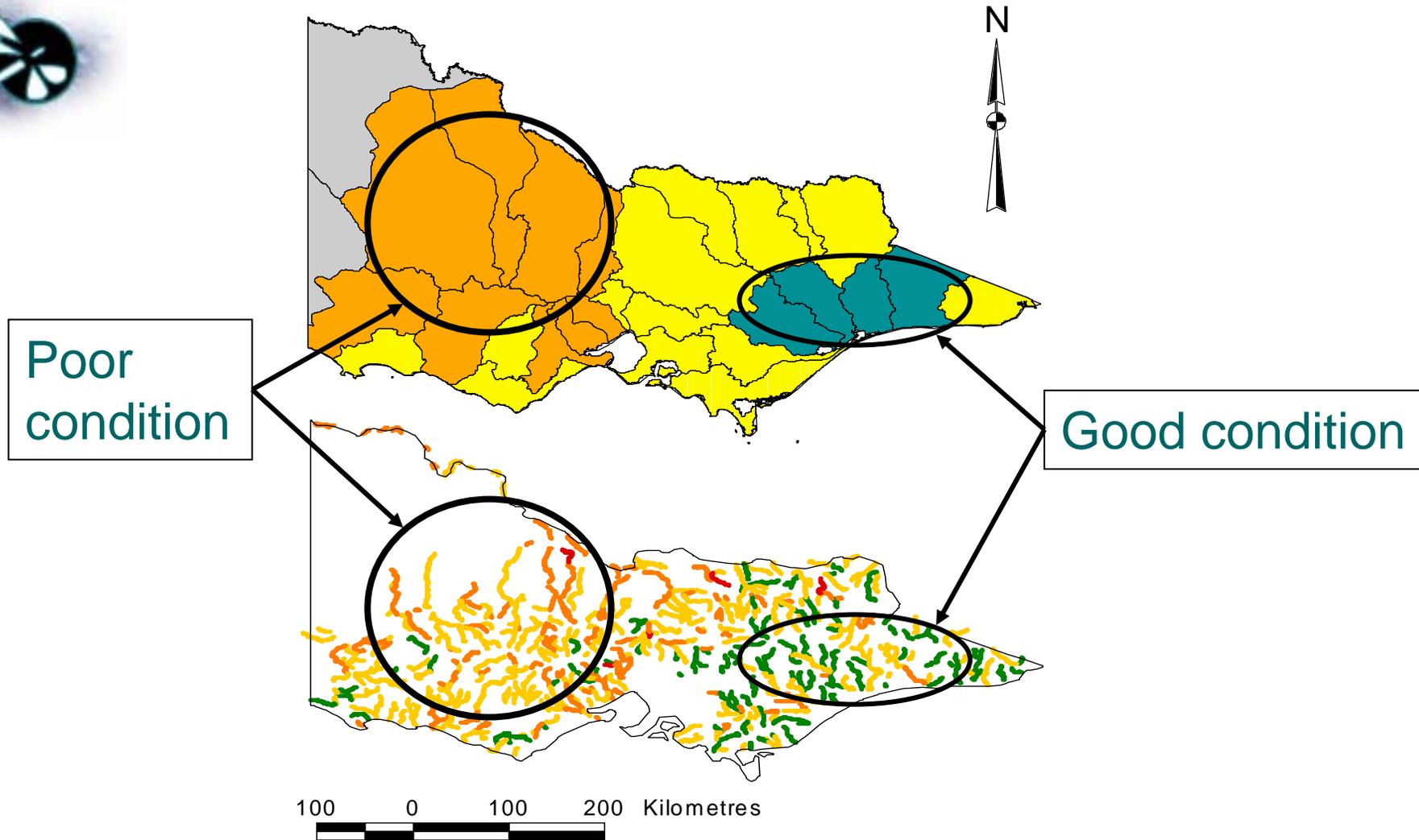


B. ARCE

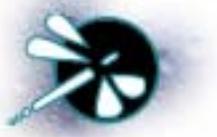


	ISC/50	ARC _E
Mean	0.57	0.58
Standard deviation	0.15	0.14
10 th percentile	0.42	0.41
90 th percentile	0.82	0.79

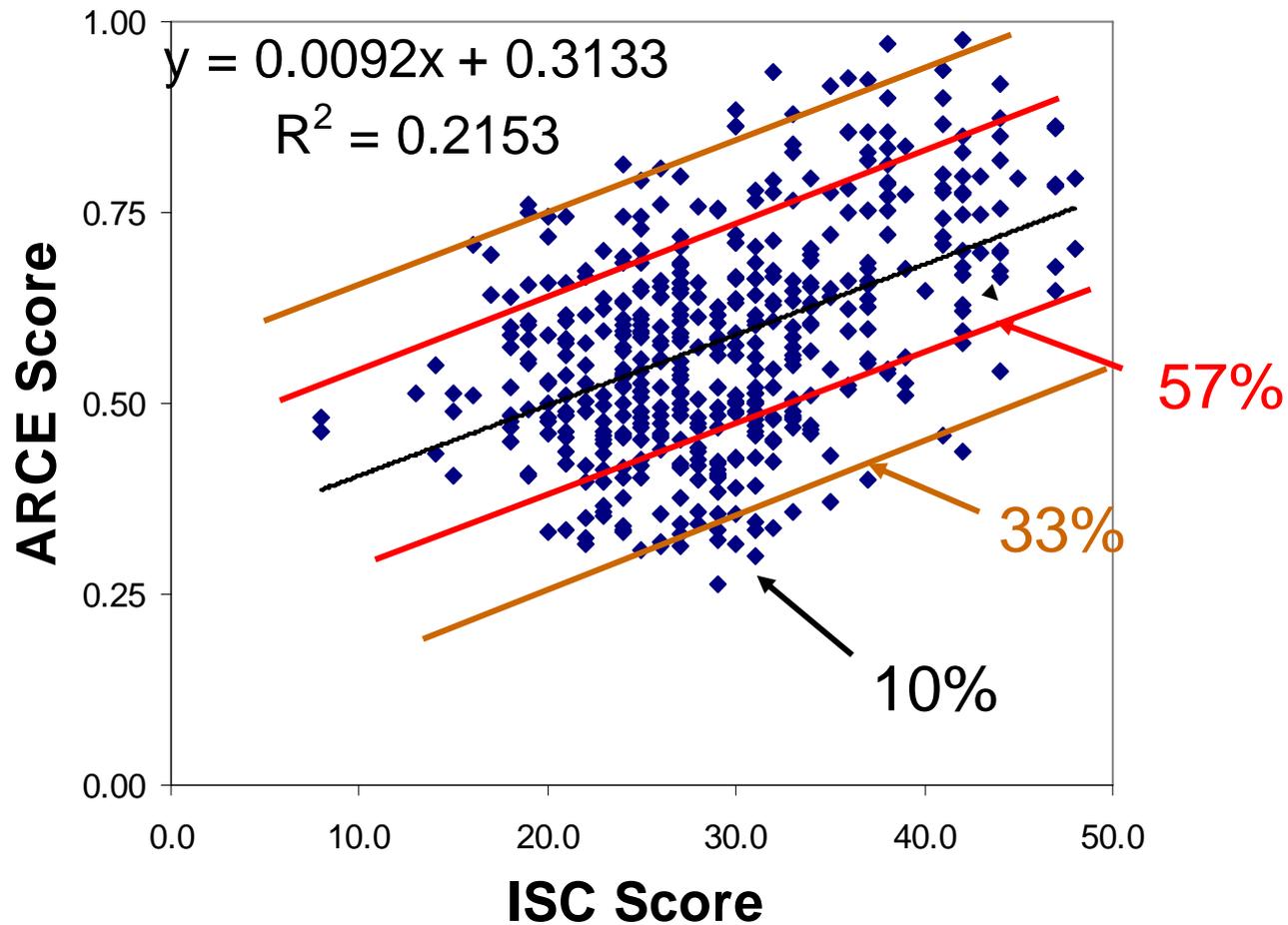
Large-scale comparison 470 reaches



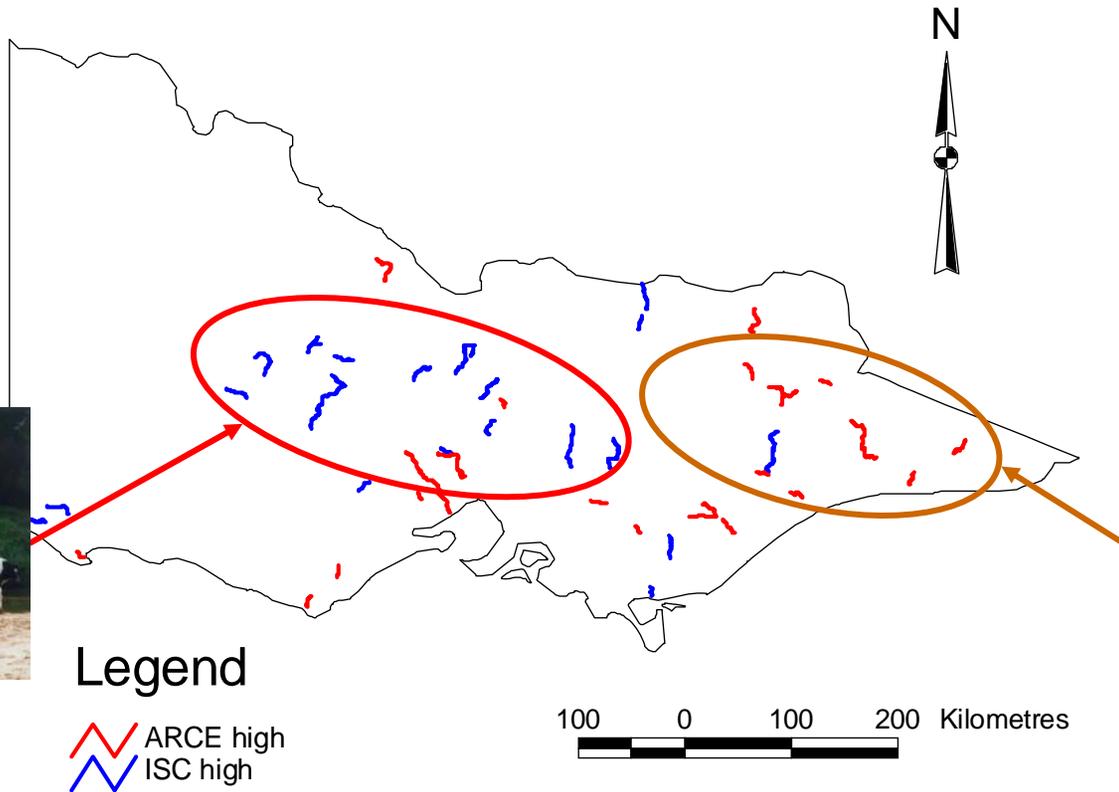
Large-scale comparison 470 reaches



ARCE vs ISC Scores



Reaches > 25% difference



Lowland agricultural



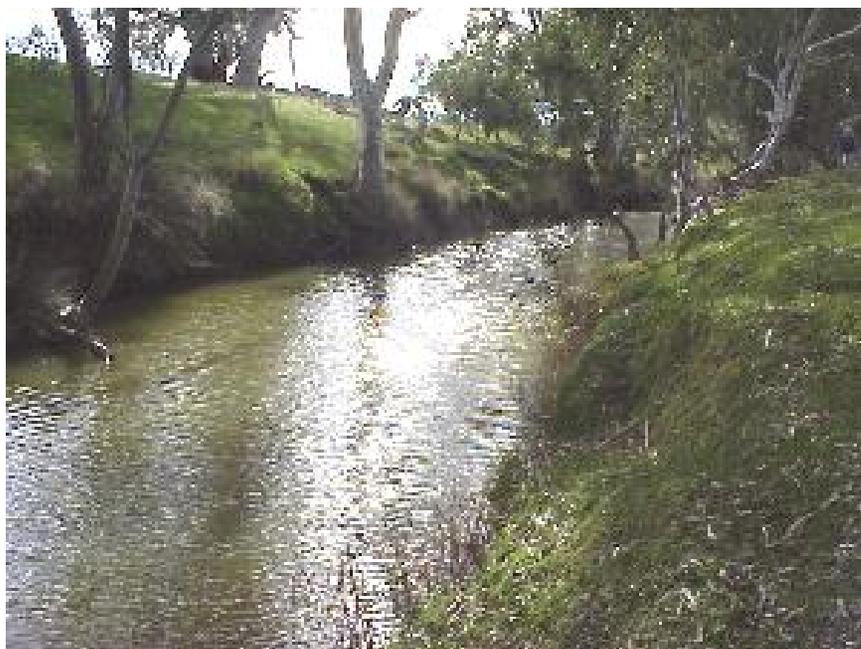
Alpine forested





Assessment errors

ISC error



ARC error



Indices considered together provide more accurate assessment
Demonstrates the benefit of considering both data sets



Summary

- Implementation of a national initiative to improve rivers & their use
- Index selection based on a conceptual model
- Indices created in a similar manner
- Framework to cover the whole country, provide comparable assessments & reconcile state differences/needs
- Initial comparisons yielded similar assessments