Development of metrics and an electronic platform for rapid visual assessment of urban streams

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Georges Riverkeeper
- coordinated catchment-scale waterway management in southern Sydney
- funded by local councils for core Programs
  - River Health Monitoring
  - Stormwater
  - Research
  - Catchment Actions
  - Community Engagement & Capacity Building
- supplemented by grant-funded projects
- partner with councils, state government, universities, schools and contractors
Traditional Georges Riverkeeper monitoring (50 sites):
- riparian vegetation (visual assessment in field)
- water quality (field collection and laboratory analyses)
- macroinvertebrates (field collection and laboratory identification)

10 years of data collection
**Problem**
Traditional waterway monitoring restrictive:
- time consuming
- expensive water quality analyses
- restricted number of sites
- focused on ecological condition
  - measuring symptoms, not causes
  - urban streams are highly ecologically degraded, but they have other values
Aim
Develop a monitoring platform for collecting data at high spatial resolution to guide urban waterway management for multiple values
Solution
Rapid Visual Assessments with electronic data entry:
- more cost effective
- allows collection of information at higher spatial resolution (>10 sites/person/day)
- allows assessment of anything that is visible, not limited to ecological values
- needs tablet and storage capacity
Example of data collection: vegetation structure & liveability
Visible metrics (some causes, some symptoms) useful for informing management:
- Site features: land uses, litter, sewer, stormwater, odour, turbidity
- Riparian vegetation: width, vegetation type/structure, weeds, habitats (e.g. remnant trees, hollows, logs, rock outcrops), based on Rapid Riparian Assessment (Findlay et al. 2011)
- Channel features: bed and bank types, channel shape, meanders, pools and riffles, instream large wood or rocks, overhanging vegetation shading, based on River Styles (Brierley & Fryirs 2005, www.riverstyles.com)
- Deposition and erosion: benches, bars, islands, undercutting, slumps, gullyng
- Liveability: interpretative or warning signs, paths/access, antisocial indicators, dominant sounds, nearby facilities, likely uses, maintenance issues
Integrated with desktop information
- Mitchell Landscape
- Plant Community Types
- Key Fish Habitat
Plus, other non-visual data (e.g. water quality, macroinvertebrates)
Example of landscape-scale mapping

- Erosion
- Weeds

- Land use
- Aquatic habitat
- Channel form
- Buffer width
- Erosion & Deposition
- Weed cover
- Vegetation structure
Being used for:
- quantifying hotspots for management
- Subcatchment Management Plans to aid proactive waterway management
- monitoring to quantify shorter term reach-scale management successes (ecological and social), whilst also guiding longer term and larger scale management
Conclusions

Visual metrics and electronic platform are powerful tools for:

- collection of a large amount of data
- assessing causes and symptoms
- informing management at a range of spatial and temporal scales
- informing management for multiple values (not just ecological)

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