



DRAFT Notes from Living Laboratories:  
Emerging Technologies in Environmental Monitoring  
National Wine Centre, Feb 12<sup>th</sup> 2008

**11.10am Discussion**

**What surprised/interested you? General lessons. What ideas did you come up with?**

- Tanya Munro and her Photonics was impressive and surprising. It was thought that it could be applicable to water quality monitoring. But can it be robust and reliable?
- Much potential exists for real-time data using cheap sensors and telemetry systems.
- RFID tags could be used for fauna tracking.
- Anton van den Hengel and Video Imaging – new and interesting. Could you use old footage from the National Film Archive and compare it with current footage in 3D?
- It will be challenging to integrate such a range of technologies.
- Video and data collaboration – could one be used to back up/confirm the other?
- RFID appears to be low cost but could there be more effective collection?
- Would it be possible to do underwater video transects in 3D?

**1.10pm Discussion**

**What surprised/interested you? General lessons. What ideas did you come up with?**

- Web-based = easy access
- PCR is a very fast method
- Data sharing (or lack of it) is a big issue – where is the data and who owns it?
- There is a real need to increase data availability
- Portable field equipment and real time monitoring
- DNA movement in soils/sediment was of interest.
- Does the volume of data from DNA techniques make it costly?
- Genetics and IT – much potential.
- Remote monitoring of change – possibility?



### **2.05pm Discussion**

**In groups, discuss all or either: a) Innovation – taking ideas to market, b) development of ideas into pilot testing, c) new research/ideas.**

#### Group 1

##### a) (short term)

- Software – open platform integration  
Standards – needs multidisciplinary team
- Interfacing with data – interpretation
- Audit of : sensors available, indicators used/measurements taken
- Evaluation of monitoring programs – are we measuring the correct things?
- Sharing of collected data

##### b)

- Broader application of DNA testing and video
- Identify NRM needs
- Economies of scale for some technologies – broader applications to decrease unit costs

##### c)

- Networking of sensors and information management
- High level of analysis and reasoning of data
- Autonomous, coordinated sensors
- Fibre-optic and measuring chemical contaminants, later biologicals

#### Group 2

- Standardisation of data – comparable data sets
- Open data (wide access) – fee for access? Eg. BOM site, Google Earth model
- Distinguish between people interest and scientific data. Levels of data interpretation eg. Stop Go/red green
- Value – intellectual property to apply
- Taking data from various sources and developing people friendly websites. Sponsors/advertising potential by companies (ie surf predictions site which now has billabong ads etc), wetlands and dam storage.
- Broad applications – environmental data applied in other areas

#### Group 3

##### b)

- Fibre-optics – real-time water quality monitoring. Hook it up to shutdown system management.

##### c)

- Correlating of unrelated data (look at the bigger picture)
- Consolidation and sharing of data



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- Genetics – to identify species that have been through drought or exist in drier climates, that may be adapted to climate change (Jeremy Austin thinks it is 5-10 years off)

#### Group 4

How to get new products commercialised.

- Environmental Cluster as a sub-group of Water Industry Alliance, to further the interaction of the players involved in monitoring.
- Need government interaction
- KEY: Get information exchange happening.

#### Group 5 c)

- Warehouse for SA Government data, with tools for presentation eg dashboard
- Data rich, information poor? Need to know how to manage it.
- Opportunities from WRON
- Fibre-optic sensors (cheap and disposable) for pigments etc. Current probes are unreliable.
- Self powered PIT tags. Could the tags get some power from muscle movement so that the stronger the signal, then more distance travelled.
- Underwater video and 3D modelling for marine systems
- Automatic DO sensing with telemetry
- UV and pollution (eg dust) levels in local area delivered to mobile phones in real time, as well as weather updates
- Conceptual models tools

#### Group 6

- Practitioner: - define problem  
- explore solutions/technologies (constraints – costs etc)
- Researcher: - explore technology
  - pathways to applications (don't worry about \$, technology becomes cheaper)
- Fragmentation: clusters, supply chain standardisation (eg. Telecoms), ISO (eg. sensors , protocols)
- NRM monitoring – is a cottage built industry with custom built solutions. Need to see connections and make linkages across boundaries.
- Coordination of user requirements. Science > decision-making.
- Agent for end users
- Consortia approaches



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Group 7

- Monitoring:
  - why?
  - for whom?
  - for what outcome?
  - where?
- Communication issues:
  - reach investors/market
  - public support for funding
- Identify specific projects:
  - market assessment
  - investment potential
  - identify existing products and applications
- Fibre-optics:
  - identify applications
  - field testing
  - development of partnerships
  - identify potential



## **Panel Discussion**

### Richard Hopkins

- Be aware of the international market for monitoring, data management systems, control system etc.
- Huge international investment portfolio (eg. World Bank – Pakistan \$4billion implementation budget).
- Near neighbours look to Australia for technology, so opportunities exist.
- Developing countries can still use new technologies (ie landlines aren't widely available and are unreliable – so they have skipped to mobile phones.

### Bill Cooper

- Reiterates that developing countries that don't have the infrastructure for old/current technologies will move straight to new and improved technologies.
- ICEP – eg. NRM councils and industry, to seek funding to advance areas of interest/industry.
- Innovation, Collaboration, Industry body, Industry players

### David Viola

- Great opportunity exists with the State Innovation and Investment Fund (aimed at the south) of \$30million – developed after the Mitsubishi closure.
- First call for those with ideas/funding requests – March/April

### Peter Butler

- NRM Research Alliance – research providers and deliverers. State and Commonwealth funding opportunities.
- NHT3 – Phase 3 of Natural Heritage Trust funding. Be aware of it. Climate change, monitoring and evaluation may feature.
- Potential technologies into CRC's – they have a strong commercialisation focus.

### Joe Flynn

- Electricity industry has gone from: not all metered > incompatible meters > advanced well beyond what they thought they could achieve in that time. Could also be the case environmentally.
- Multidisciplinary, dash board approach is needed.
- Collaboration needs personal energy and networks.



### **Final Discussion**

- A good model is SWIG (Sensors for the Water Industry Group) in the UK. The whole industry is represented and the group meets approximately two times per year to discuss what is needed, what is new etc. Their website is comprehensive and documents presentations etc.
  - A way of moving forward – forums with that apply to more specific areas ie a SA Water focused forum, a NRM focused forum. Engage the audience around the theme and have them present back.
  - A different approach – ‘this is the problem, what technology can you offer’ as opposed to the approach used today of ‘here is some technology, it could be applied to ...’
  - Involve the on ground practical people for their input on what is needed. Eg. Natural resource management requires answers on the ground and sensor won’t suffice for much on ground monitoring.
  - Other industries that require monitoring: mining, agriculture, waste, pulp and paper.
  - 3 groups appeared to be present at the workshop
    - resource users and managers
    - environmental impact assessors
    - biodiversity managers
- Perhaps some work in these separate groups would be useful.

### **Podcasts are available from:**

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