AGRICULTURE VICTORIA

Evaluating the use of a web-based nitrogen cycle animation

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An interactive animation of the nitrogen (N) cycle is available on the Victorian Resources Online (VRO) website (http://vic.gov.au/vro). It is one of a series of interactive web-based animations developed to capture and communicate soil knowledge and explain complex soil and landscape processes within agricultural systems.

The need

The N cycle is complex and non-experts can find it difficult to understand. There are many N cycle animations but few are interactive, web-based, or focus on a dairy system.

Knowledge capture

Hand-drawn 'storyboards' were developed with input from five soil scientists – each providing different perspectives on N (e.g. farming system, soil biology, soil chemistry and greenhouse gas) related to a dairy management system.
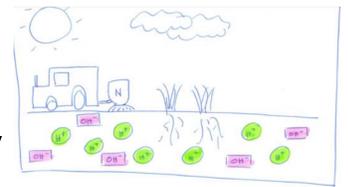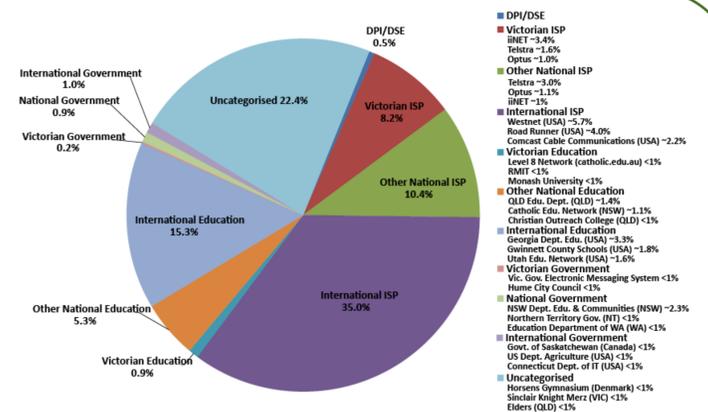
The animation

A sequence of animated scenes were created from the 'storyboards' and then web-enabled, allowing users to move through scene-by-scene or in continuous play mode.
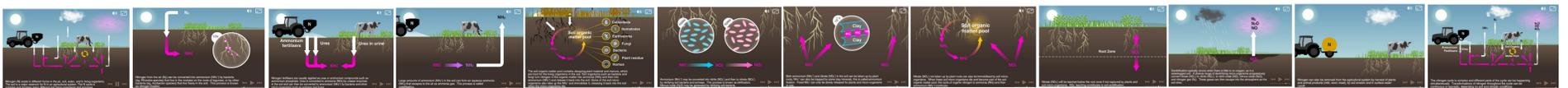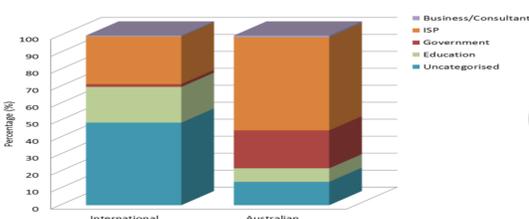
Assessing use of animations

Web usage was analysed using a web analytics package (Google Analytics). This informs about visits to specific web content, the amount of time spent, and visit origins. The broad user base for a series of soil/landscape animations is demonstrated in this pie chart that shows 2012/13 usage by broad user categories and lists some significant users. Some key learnings: the majority of users (over 50%) access animations via an Internet Service Provider (ISP) not linked to a jurisdiction and a significant user base (over 20%) is associated with an 'education' jurisdiction.

Pie chart categories:
- DPI/DSE 0.5%
- Victorian ISP 8.2%
- Other National ISP 10.4%
- International ISP 35.0%
- Victorian Education 0.9%
- Other National Education 5.3%
- International Education 15.3%
- Victorian Government 0.2%
- National Government 0.9%
- International Government 1.0%
- Uncategorised 22.4%

Legend:
- DPI/DSE
- Victorian ISP: iiNET ~3.4%, Telstra ~1.6%, Optus ~1.0%
- Other National ISP: Telstra ~3.0%, Optus ~1.1%, iiNET ~1%
- International ISP: Westnet (USA) ~5.7%, Road Runner (USA) ~4.0%, Comcast Cable Communications (USA) ~2.2%
- Victorian Education: Level 8 Network (catholic.edu.au) <1%, RMIT <1%, Monash University <1%
- Other National Education: QLD Edu. Dept. (QLD) ~1.4%, Catholic Edu. Network (NSW) ~1.1%, Christian Outreach College (QLD) <1%
- International Education: Georgia Dept. Edu. (USA) ~3.3%, Gwinnett County Schools (USA) ~1.8%, Utah Edu. Network (USA) ~1.6%
- Victorian Government: Vic. Gov. Electronic Messaging System <1%, Hume City Council <1%
- National Government: NSW Dept. Edu. & Communities (NSW) ~2.3%, Northern Territory Gov. (NT) <1%, Education Department of WA (WA) <1%
- International Government: Govt. of Saskatchewan (Canada) <1%, US Dept. Agriculture (USA) <1%, Connecticut Dept. of IT (USA) <1%
- Uncategorised: Horsens Gymnasium (Denmark) <1%, Sinclair Knight Merz (VIC) <1%, Elders (QLD) <1%

Snapshots of N animation usage

In the period from 2011-2013, the N cycle animation was the fifth most accessed page (with 26,603 page-views) for the entire VRO website, that then comprised 7000 content pages. User profiling for the N animation, based on Internet Protocol (IP) address tracking, was undertaken for a three-month period in 2013 (Sept-Nov). This involved measuring page-views and categorising users into broad groups (i.e. 'education', 'government', 'consultant').

Bar chart legend:
- Business/Consultant
- ISP
- Government
- Education
- Uncategorised

(y-axis: Percentage (%); x-axis: International, Australian)

Access to the N cycle animation by the 'government' sector was significantly greater in Australia compared to internationally. The 'education' sector was proportionally larger internationally.

Service Provider	Visits	Pages/Visit	Avg. Visit Duration
	2,443 % of Total: 100.00% (2,443)	13.84 Site Avg: 13.84 (0.00%)	00:06:18 Site Avg: 00:06:18 (0.00%)
1. iiNet limited	142	15.34	00:04:27
2. Telstra internet	132	9.19	00:06:50
3. Spokane school district #81	101	39.15	00:10:49
4. Harford county (md) school	92	35.45	00:09:40
5. NSW department of education and communities	75	11.15	00:02:39
6. optus internet – retail	66	12.82	00:08:01
7. orange county public schools	69	13.92	00:02:40

Example of raw web analytics data - highlighting significant usage from two US school districts (Spokane and Harford County) in a three-month period.

Qualitative feedback from users provides additional perspectives on the 'usefulness' of animations to support their work. Some examples include:

"Fantastic animations! I am involved in giving talks on soil pH and Nitrogen...a great resource to have" and *"Great job on the audio and animation. This makes the animations now really friendly to use with farmers"* Dairy extension officer

"I have also used all the animations that are available in my teaching to illustrate the different processes that occur. The animations are particularly useful in showing dynamic processes, and feedback from the students suggests that they appreciate the short movies which are easy to understand and provide a good introduction to the topic" University lecturer