2013

Ten trenches: a scienceart collaboration

Timothy J. Cohen
University of Wollongong, tcohen@uow.edu.au

Martin Cohen
Hunter New England Mental Health Service, Martin.Cohen@hnehealth.nsw.gov.au

Stephanie Kermode
University of Wollongong, sjk51@uowmail.edu.au

Michael G. Leggett
University of Wollongong, mleggett@uow.edu.au

Publication Details

Cohen, T. J., Cohen, M., Kermode, S. & Leggett, M. G. (2013). Ten trenches: A scienceart collaboration. Leonardo, 46 (1), 74-75.

Ten trenches: a scienceart collaboration

Abstract
Collaborative and cross-disciplinary research by a group of artists and scientists in an Australian rural setting generates data and ideas that form the basis of a wider understanding of the ramifications of global warming and cooling within the local, regional and national community. The work is viewed as an initial educational platform that will allow the public to see and understand the complexities of climate-based research.

Keywords
ten, collaboration, trenches, scienceart, GeoQUEST

Disciplines
Life Sciences | Physical Sciences and Mathematics | Social and Behavioral Sciences

Publication Details
Cohen, T. J., Cohen, M., Kermode, S. & Leggett, M. G. (2013). Ten trenches: A scienceart collaboration. Leonardo, 46 (1), 74-75.

PROJECT MUSE®

TEN TRENCHES: A SCIENCE-ART COLLABORATION

Cohen, T.J., University of Wollongong: <tim_cohen@uow.edu.au>; Cohen, M.A., University of New South Wales; Kermode, S.J.K, University of Wollongong: <sjkl51@uow.edu.au>; Mike Leggett, University of Wollongong <mleggett@uow.edu.au>.

See <www.mitpressjournals.org/toc/leon/46/1> for supplemental files associated with this issue.

Submitted: 9 April 2011

Abstract

Collaborative and cross-disciplinary research by a group of artists and scientists in an Australian rural setting generates data and ideas that form the basis of a wider understanding of the ramifications of global warming and cooling within the local, regional and national community. The work is viewed as an initial educational platform that will allow the public to see and understand the complexities of climate-based research.

Ten Trenches is part of the Siteworks project, a three-year conversation between artists, scientists, historians, archaeologists and local people exploring the site of Bundanon, a rural property on the lower reaches of the Shoalhaven River, New South Wales, Australia. Bundanon Trust is a living arts centre for the creation and presentation of visual arts, writing, music and other performing arts and for the promotion of education and research in the arts. Siteworks invites selected arts practitioners, scientists and scholars to meet and stay in residence at Bundanon, responding to the site through the lens of their specific discipline and areas of interest. The artistic component of the project was funded by Arts NSW and Bundanon Trust, while the scientific element was funded by University of Wollongong and Macquarie University.

In February – March 2009, a creative development project called Ten Trenches (10T) was carried out at Bundanon. This project brought together a team of artists and a team of scientists to collaborate on a research project that delivered performance based outcomes as well as scientific data in the field of geomorphology (landform evolution) and palaeoenvironmental research – specifically in the area of sea level rise and climate change.

A science research team of five members included professorial, post-doctoral, post-graduate, and honours level researchers led by Tim Cohen. The combined teams of arts and science researchers worked in residence at Bundanon for a period of two weeks. The scientists carried out sedimentary analysis of the soil profiles on the river floodplain using a range of excavation techniques. In parallel the artistic team were familiarising themselves with the content and key research issues being addressed: sea level rise and its effects on land formation in the region 8000 years ago; similar effects are anticipated within the next one hundred years as a result of climate change and predicted sea level rise.

The science team carried out excavation works in the form of drill holes up to 27 m deep and trenches; five trenches were dug, measuring 1.2 metres wide by 10m long and up to 5m deep, between the Bundanon homestead and the Shoalhaven river. These trenches and auger holes provided the key research focus for the project – in both arts and science fields – the research process and findings providing the data that shaped all of the project outcomes (Fig. 1).

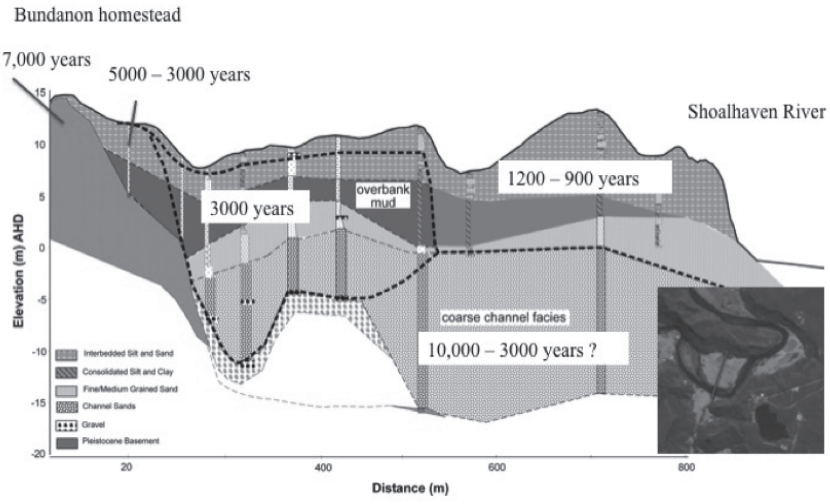
The arts team engaged in the site-based arts issues that these excavation works provided for the project. The mounds of dirt, trenches, holes, paddocks, etc. that provided the setting for the science research were also the setting for the creative outcomes of the project so the arts team were assessing how this setting responded to the relevant artforms that were being employed: projection, text, lighting, dance, etc. The artforms at this early stage were a direct response to the scientific processes as well as their anticipated outcomes. Also informing the artistic outcomes were dramatic influences such as indigenous and colonial occupation of the area, current use of the land (for agriculture and art) as well as contemporary regional concerns (both rural and urban).

At this early stage of the overall Siteworks project, it was vital the scientific basis for the work be driven by environmental enquiry – otherwise the work risks becoming superficial and its relationship to site frivolous. Prior to the project, it was anticipated by the science team that one of the research outcomes would be the discovery of evidence of past estuarine conditions in the Bundanon region formed when sea level reached its present height 8000 - 7500 years ago. This notion of using the past as an analogue for the future was driving the investigation into how the landscape will respond to the predicted 21st century sea level rise. While some artistic conceptual work followed this hypothesis (e.g., a performance scene involving performers and oysters) the ultimate scientific findings did not support the initial hypothesis. At that point, while neither necessarily for better nor worse, the artistic and scientific research processes diverged.

Findings – the Science

Analysis of the trenches and drill holes highlighted a long but discontinuous sedimentary history for the Bundanon site. Using a range of geochronological techniques, the scientific research determined that the 'modern' floodplains that we see today formed 5000 years ago and not 8000 years ago as previously hypothesized. These floodplains themselves rest on ancient alluvial surfaces that reflect periods of the Earth's history when the earth

Fig. 1. Sedimentary profiles at the Bundanon transect looking downstream. Each of the vertical sedimentary logs represents locations where cores were taken. From these ages of either organic material or quartz were determined to construct a sedimentary history of the floodplain. (© Bundanon Trust)



was experiencing the last ice age. Furthermore, the science research also demonstrated that the Shoalhaven River has either migrated or avulsed (jumped) from the location near the homestead to its current position between 5000 and 1200 years ago. Importantly the research has shown that not only did it reach its present position 1200 years ago but it appears that the current river channel and its huge levees (15 – 20 m high) were built in ~ 300 years during a warmer period on the planet termed the medieval climatic anomaly (MCA). This riverside levee may hold a vital clue to the nature of the climate in south-eastern Australia during the MCA and will be the focus of future palaeoenvironmental research.

One of the additional findings that has stemmed from this work has been the ability to identify the controlling factors in determining how far upstream sea level rise will impact the landscape on the Shoalhaven River. Hydraulic modelling along with additional sedimentary analysis has shown that a geological bottleneck downstream of the site plays a critical role in determining the level of present and predicted flood levels. The science team is aiming to implement this technique across the eastern seaboard of Australia to determine the spatial extent of the impacts of predicted sea level rise.

Findings – the Art

The creative emphasis of the work was always anticipated to be development driven and not public-outcome focussed. Given the short timeframe of the project (key artists on site for only 7 – 10 days) it was imperative that it not be derailed by the production outcomes of creating a 'show' nor by trying too hard to create a shape of any future production. Rather it was important to maintain a key focus on the artistic form, collaborative relationships, dramatic and intellectual content as well as the context and setting for the work.

The 'showing' was devised and directed by Michael Cohen in ensemble with performers Katia Molino, Kraig Grady, Cecil McLeod and the Doonoch Dance Company, together with Craig Walsh, projectionist; Sydney Bouhaniche, Lighting designer, production manager; Terumi Narushima, composer.

The performance elements that were exposed to the audience demonstrated some of the creative potential of the collaborative outcomes. Four short scenes were shown to the ambulatory audience in a 'stop-start' fashion. The emphasis was never to create a cohesive 'show,' yet the scenes demonstrated the potential effectiveness of performance on the site as an expression of environmental change (Fig. 2).

Discussion

The project achieved some important outcomes. There was a great culture of collaboration fostered not only between the arts and science research teams, but also between the key artists including the indigenous Doonooch Dance Company. The company normally performs its set pieces in a variety of different contexts around the world. 10T gave Cecil McLeod and the company time to explore new ways of working creatively and in a setting in their own region.

10T was widely-exposed and well-received across a range of contexts. The inter-disciplinary nature of the project meant that it received wide interest on regional and inter-regional levels as well as a very broad exposure state-wide on ABC TV's Stateline programme.

In terms of stakeholder development, 10T was also significant in that it brought together diverse fields (arts, science, education) in a manageable context and provided a glimpse of what such potential partnerships can yield. There was insightful discussion of the project process and its relevance between science and arts industry peers during the forum and again more informally after the showing in March 2009. These alliances were further explored in the subsequent Siteworks Arts – Environment laboratory at Bundanon during 2010, Siteworks 2.

The format devised for Siteworks 2 intensified the contact between participants. It comprised a full week with invited artists and scientists in residence, called The Lab, allowing time for further practical investigation and preparation, during which time invited specialists attended for day long visits. This culminated in the Field Day, when the residents presented their findings across the whole Bundanon site to a public gathering. This was reinforced on the following day by The Conversation, a public symposium addressed by environmental and life systems scientists and invited artists. The Siteworks project will be the subject of a later more detailed research report.

Fig 2. The gothic depictions of the performance offer a faithful reproduction of the impact of some of the work. Audience members responded positively about the affective and aesthetic qualities of the performance and expressed a keenness to see further development of the work. (© Bundanon Trust. Photo: Doug Spowart)