



Mountains to the Sea:

Reflections on an arts and science collaboration
about the Motueka River Catchment

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Published by Mountains-To-The Sea Project
C/- Manaaki Whenua Landcare Research
PO Box 69, Lincoln 8152
Canterbury, New Zealand

Kilvington, Margaret
Mountains to the sea: reflections on an arts and science collaboration about the Motueka River catchment / Margaret Kilvington and Chrys Horn.
– Lincoln, N.Z. : Published by Manaaki Whenua-Landcare Research for the Mountains-to-the-Sea Project, 2006.

ISBN 0-478-09383-7

1. Art and science. 2. Motueka River (N.Z.) I.
Horn, Chrys, 1963- II. Title.

UDC 77.047(931.312.3:28):069.538

Cover images: from the preparation and public opening of the *Travelling River* Exhibition, Suter Gallery, Nelson, August 2004.

Design and layout by Cissy Pan, Graphics Unit
Manaaki Whenua Landcare Research

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contents



Report authors Chrys Horn and Margaret Kilvington help set up the Travelling River Exhibition

The principals in a true collaboration represent complementary domains of expertise. As collaborators, they not only plan, decide, and act jointly, they also think together, combining independent conceptual schemes to create original frameworks. Also, in a true collaboration, there is a commitment to shared resources, power, and talent: no individual's point of view dominates, authority for decisions and actions resides in the group, and work products reflect a blending of all participants' contributions. We recognize that collaborative groups differ in their conformance to this profile and that any single group may exhibit some of the features only episodically or only after long association. (Minnis, John-Steiner, & Weber 1994, p. C-2)

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Project and Objective

This report reflects on collaboration between the authors (two social researchers), two artists and two scientists who worked together on the *Mountains to the Sea* project. This project was one of three such initiatives funded by the Smash Palace Innovation Fund aimed at promoting creative partnerships between artists and scientists during the years 2003 to 2004. *Mountains to the Sea* resulted in three substantive outputs, a book documenting an online dialogue between the collaborators, an exhibition uniting community and science interpretations of the Motueka River Catchment, and this report, which explores the learning around challenging interdisciplinary collaboration.

The presence of social researchers within the *Mountains to the Sea* project team required participants to reflect more frequently on the processes of collaboration and learning that went on. This was important because participants wanted to build a process based on an equal and meaningful contribution from both science and art. Maintaining the balance of contributions was nevertheless a significant challenge. While the intersection of art and science is a small but growing area of interest, there are few analyses of the process of collaboration and recommendations for how such a challenging partnership might be managed. This report begins to rectify this information gap.

Method

The report is based on meeting minutes, our own observations and reflections on the collaborative process written throughout the project, interviews with team participants during and at the end of the process, and on the reflections of the team as a whole at various times throughout the project. The report is structured using the integrated systems for knowledge management (ISKM) framework (Allen et al, 2001b), which highlights the stages and processes that occur during complex multidisciplinary collaborations.

Main Findings

Reflecting back on the team's collaboration we have uncovered some things that, were we to set out on such a journey again, we would do differently. Notable amongst these is the need to attend more to the early phases of the collaboration (in particular the negotiated entry of new team members), and the utility in reflecting systematically and critically throughout the process so the team can progressively build on their experiences.

We also noted a characteristic of this collaboration was that roles and goals for individuals were not clearly identified at the start. While this was deliberately done to foster flexibility, the flipside was the hidden tension that arose from the discomfort some team members had as a result of not having a clearly defined task, goal or end point in front of them. Active facilitation is needed to foster individual growth and development in such an unstructured collaboration.

The quest for good 'art science' and a balanced contribution from both artists and scientists was very much a part of the *Mountains to the Sea* collaboration. Although the learning for all involved was substantial, the collaboration ultimately fell short of some of the ideals that were set. This review is an attempt to capture this learning and to make available to others some of the critical elements in how a productive and successful collaboration between artists and scientists might look.

On 7 August 2004 the *Travelling River* exhibition, the major outcome of the *Mountains to the Sea* Arts–Science collaboration, opened at Nelson's Suter Art Gallery. A packed audience of unusual composition attended the exhibition opening. Artists and long-term supporters of the Suter Gallery mingled with environmental researchers and managers of science institutions. Policy makers from Wellington government departments for the arts and sciences queued for wine beside local people of the Motueka River catchment – fishers, farmers and teachers and those for whom the catchment was turangawaewae. But how did an exhibition come about from such diverse participants?

This report reviews the process by which a group of artists and scientists came together in the *Mountains to the Sea* project to generate a unique cross-disciplinary collaboration. Groups working together on projects where the task or product is not defined 'up front' inevitably produce something distinct from what any one individual may have developed alone. But such working relationships, particularly when engaging people from diverse disciplines and world views, are not always easy and can require close attention to the processes of developing a working language, and ultimately a shared vision. How this was achieved is the focus of what follows.



Travelling River exhibition opening, Suter Gallery, Nelson, August 2004.

2. background

2.1 SciArt collaboration

In 2002, the Ministry for Research, Science and Technology (MORST) and Creative New Zealand joined forces to establish the Smash Palace Fund to promote collaborations between scientists and artists ('SciArt' collaboration). In response, Landcare Research (a Crown environmental research institute) convened a workshop to discuss how scientists and artists might work together and to spark interest in developing proposals for undertaking collaborative work. A group of artists from around New Zealand and scientists from Landcare Research and the Cawthron Institute in Nelson, along with MORST and Creative New Zealand representatives from the Smash Palace programme, were invited to attend.

Two possible collaboration opportunities directly emerged from this meeting, but only one, the *Mountains to the Sea* project, was developed into a full proposal, which was successful in securing funding support from Smash Palace. Substantial support also came from Landcare Research, which underwrote the final exhibition, funded much of the work of the biophysical researchers (when the grant money ran out), and also funded two social researchers to facilitate and support the collaboration and to carry out an evaluation of the collaborative experience.

The aim of the *Mountains to the Sea* project was to combine the skills of artists and science researchers to address the question 'What is integration and how does our understanding of integration influence the management of a catchment?'

From this, it was proposed would come two principal outputs:

- A better understanding of how those from different disciplines can successfully work together, and
- A collaborative work involving the people living in the catchment that conveys and promotes an understanding of the integrated nature of the Motueka Catchment environment.

The core project team of the *Mountains to the Sea* project were two Landcare Research biophysical, catchment researchers, Andrew Fenemor and Chris Phillips, two social science researchers (also from Landcare Research and the authors

of this report), and two artists, Maggie Atkinson (working independently) and Suzie Peacock (based at the Nelson Marlborough Institute of Technology) See Appendix 1 for participant profiles. The team was essentially divided in two logistically, with Andrew, Maggie and Suzie based in Nelson and the other three working some 400 km away at Lincoln in Canterbury.

A number of others contributed substantially to the project. Nelson artists Gavin Hitchings and Ian MacDonald and Wellington artist Anne Noble helped in a variety of roles. Their input and participation were highly appreciated and valued by the team.

The project spanned almost three years and has produced two main outputs: the *Travelling River* exhibition, and associated catalogue; and a book entitled *Conversations about a River*, which captured extracts of the online conversations between the collaborating artists and scientists as they developed their collective work. This document, the third main project output, is the work of the two social researchers who were part of the core collaboration team in the *Mountains to the Sea* project.

2.2 Reviewing a SciArt collaboration

Our compilation of this report has been based on four principal sources: data from interviews from the team participants; meeting notes; the reflections we recorded throughout the process of both our own experiences of the meetings and teamwork, and our facilitative role within that team; and the reflections that we made as a team working through this collaboration.

Our attention here is on the collaborative process as it unfolded within the core team of six members. In focusing this way, we have chosen to define the collaboration more narrowly than it had been perceived by others in our team. As social researchers, we found this review process gave us valuable insights into the different perspectives that team members have of the process, and it has forced us to think long and hard about the risk of privileging our own voices as participants, while also bringing our knowledge about

collaborative processes and our training as social researchers to bear on our analysis. The review process also made the team realise that we really needed to meet together once again to find some closure on what has been a tremendously rewarding and interesting project.

In our experience of working with a range of groups to understand collaboration, and in our own experience of being part of collaborative research teams, the collaborative process is often difficult, particularly when a group is aiming to push boundaries and explore and build new ideas. As expected, the collaborative process within our team was not always easy and, at times, we (the authors) felt that we made mistakes, both as facilitators and as participants – we would do some things differently next time. We perhaps learned the greatest amount about working together from the more difficult aspects of the experience. For us, who study collaborative and group processes, this has been a challenging and fecund microcosm of learning and we are enormously grateful for the opportunity to work with this interdisciplinary team as facilitators, participants, and observers.

Our interpretation of the *Mountains to the Sea* collaboration is based on a literature review of thinking around collaboration, its key features, and some ways in which it can be understood (Appendix 2). The report gives an account of the *Mountains to the Sea* project team as it worked through the process of establishing first connections through to delivering on the task of creating a joint work. Alongside this are our observations of key actions and influences that shaped the trajectory of the collaboration. The report is structured using the integrated systems for knowledge management (ISKM) framework (Allen et al, 2001b), which highlights the stages and processes that occur during complex multidisciplinary collaborations (Appendix 2).

3. objectives

These were to analyse the process of collaboration in the *Mountains to the Sea* project, capture the learning and make available to others some of the critical elements in how a productive and successful collaboration between artists and scientists might be managed.



4. project overview

The passage of *Mountains to the Sea* can be traced through a number of events and activities (Table 1). As there was some flux in team membership and the active involvement of different project team members during the different phases of the collaboration, this has also been indicated.

SciArt initiatives, such as the *Mountains to the Sea*, have emerged from a growing interest in bringing people from divergent disciplines together to encourage new insights and discoveries. Even amongst other SciArt initiatives (e.g. Wellcome Trust Sciart Awards), this project had some unique aspects. The primary intention was to unite diverse views to create a new understanding of a situation, from which it was expected a collaborative 'work' would emerge that expressed this new way of looking at things. Thus, the collaboration began with no clear, concrete outcome in mind. Roles for participants were not defined, and the initial stages of the collaboration were focused on research and development. Recognising that such an initiative would require some active facilitation, and also that there was much to be gained from learning how such collaborations worked, the project included two social researchers – again an action unique amongst such initiatives as far as we are aware.

Table 1 Timeline of events in *Mountains to the Sea* project.

Dates	Events	Participation
March 2002	Smash Palace meeting held in Wellington by MORST	
October 2002	Art and Environmental Science: a one-day workshop for artists and scientists to discuss options and issues around collaboration. Held by Landcare Research in Nelson	Invited scientists, artists, MORST, Creative NZ. Included all but one artist who later made up <i>Mountains to the Sea</i> core team
Feb 2003	<i>Mountains to the Sea</i> proposal submitted to Smash Palace Fund	Five of the core team plus Gavin Hitchings
June 2003	<i>Mountains to the Sea</i> collaboration work begins with meeting in Nelson	Core team
July 2003	SciArt team shared online, work space developed	Core team
Aug–Oct 2003	SciArt online dialogue, face-to-face discussions	Core team plus Ian MacDonald
Nov 2003	Workshop in Nelson to agree project	Core team
Mar 2003	Presentation at Smash Palace project review meeting	Maggie Atkinson, Margaret Kilvington, Andrew Fenemor
June–July 2004	Intensive work on gathering images and 'voices' in Motueka. Designing and building exhibition installation, collaboration with Cliff Fell, poet	Nelson team members
Aug 2004	<i>Mountains to the Sea</i> exhibition opens at Suter Gallery	Core team
Dec 2004	<i>Mountains to the Sea</i> exhibition on display in Motueka Museum	Nelson team members
Mar 2005	Invitation to Seattle conference, Art culture, Nature (May 2005)	Maggie Atkinson, Andrew Fenemor
Mar 2005	Draft collaboration review report	Margaret Kilvington, Chrys Horn
Mar 2005	Invitation to 'Desire Lines': art and ecology symposium at Dartington Art College, UK. (September 2005)	Maggie Atkinson, Andrew Fenemor
July 2005	<i>Conversations about a River</i> book produced	Suzie Peacock, Ian MacDonald
July 2005	Review of collaboration report & closure meeting	Core team

5. Entry and Contracting

Some of our current theoretical understanding of collaboration is outlined in Appendix 2. This includes a discussion of what characterises an ideal collaboration in the literature; Atherton's (2003) work highlighting the effect of not having a concrete outcome decided before a collaborative project begins; and an outline of the Integrated System for Knowledge Management Model (Table 2; Allen et al.2001b),

which suggests distinct phases in a complex collaborative process. These phases are termed entry and contracting, information sharing, project planning, implementation and review. Each phase has tasks that must be completed if the project is to be successful. However, no process is simply linear and, as Table 2 shows, the different ISKM stages do not always map onto specific events.

Table 2 Main phases of the collaborative process using an ISKM analysis, the framework for this report.

ISKM phase	Project events
Entry and Contracting	Initial workshop Proposal writing First team meetings Bringing in new team participants
Information sharing (building a 'common language')	Proposal writing First team meetings Dialogue process Implementation process
Project planning	Web-based dialogue Later face-to-face meetings Agreeing on <i>Mountains to the Sea</i> exhibition Developing exhibition concept
Implementation	Collecting stories and photos Exhibition in Nelson and in Motueka
Review	Largely led by the social researchers Occurred throughout process (at each face-to-face meeting) Mid-way review of collaborative process (some interviews) Final review of implementation (interviews and review of data)

Allen et al. (2001b) describe this phase of collaboration as the stage at which likely participants are identified, and the protocols for interaction are established. Wood and Gray (1991) say that the context under which a collaborative project begins and the role of the convener of that collaboration has significant bearing on the outcome, i.e. 'How you start is often how you continue' (Dick 2005). Similarly Allen et al. (2001a) observe that the challenges in the entry and contracting phase of a collaboration and the time necessary to work through this stage are often underestimated. Although we as social researchers were aware of this, we learned a great deal more about it during the *Mountains to the Sea* project. This phase is about bringing in the necessary participants, attending to their separate needs and agendas, and setting ground rules for how the collaboration will work. In this project the entry and contracting phase lasted well beyond the initial meeting. It included the proposal development and the first meetings of the project team.

These early stages were critical in establishing the values of balance and reciprocity that became a focal point for the team and in setting up lines of enquiry that the team reflected on frequently. This section, therefore, looks at the stages of the project that set the scene for the work that followed. It also looks at the ways in which new team members were brought into the project and the effect that the welcoming process had on the way the team operated.

5.1 Initial workshop – scoping the potential of SciArt collaboration

The exploratory workshop convened by Landcare Research somewhat unconsciously established some fundamental relationship ground-rules that were reflected in ongoing work on the *Mountains to the Sea* collaborative project. One simple act which contributed foundationally to the relationship between the art and science providers, was to ensure that the artists who took part were offered some payment for their time. The issues facing self-employed artists as opposed to institutionally-based science researchers were part of the conditions of interaction that were discussed during this meeting. The early recognition of the need for artists as well as

scientists to be resourced established a platform of trust and equality that greatly assisted the further development of the proposal.

The role of Landcare Research as an organisation throughout the *Mountains to the Sea* collaboration was as a significant resource provider and administration manager. The project was managed through Landcare Research administration frameworks, and additional funds were sought primarily through Landcare Research networks. Despite this considerable position of influence, non-Landcare Research participants in the project perceived the organisation as supportive rather than directive. Through this action, Landcare Research achieved credibility as a convenor of art and science collaborations and has, subsequent to the *Mountains to the Sea* project, initiated two further SciArt projects.

This foundation of balance extended into the notion of balance and reciprocity in collaborative relationships, and participants spoke firmly about their preference for working in a collaboration where art would not be subordinate to science or vice versa. Participants in the meeting observed that SciArt projects to date appeared to involve an artist reacting to, or being influenced by, the science (or rather the scientists). In contrast, while the scientists involved in these projects did sometimes feel that the artists had influenced them, they were unable, or not prepared, to say exactly how (Webster 2002).

At this first meeting, it emerged that the scientists tended to think of art as a potential new way to communicate their science to the general public. The idea that artists might reinterpret or question the science, or offer new ways of looking at a subject, was a less easy point of contact. During the meeting it appeared that, in general, the artists could grasp the questioning nature of science more easily than the scientists could grasp the questioning nature of art. These observations set the scene for what became an ongoing point of enquiry. What should collaboration between artists and scientists look like, and what might this collaboration teach us about artistic and scientific endeavours, and the nature of collaboration across disciplines?

5.2 Developing the proposal

The hub of the collaboration began in Nelson with conversations between three local people: two artists and the programme leader of the Integrated Catchment Management science programme. Both artists had previously worked in science, had historical links with Landcare Research and, consequently, were familiar with its organisational culture. During the proposal writing, the initial hub of the collaboration expanded and included conversations with other scientists and artists, not all of whom were in the final project team.

The geographical spread of those involved meant that much of the work drafting and finalising the proposal was done via email and telephone. As well as developing and justifying their ideas, the team had to negotiate issues such as resources (what would the artists and scientists be paid?) and intellectual property (who would own any work that was produced?).

As Claire Cohen (2000) observed in her review of five Sciart projects in the UK, the proposal-writing stage can be a formidable challenge as the first step in an interdisciplinary collaboration, even though it is an exercise highly familiar to both artists and scientists. Given the preliminary nature of the collaboration, the challenge in the proposal writing was to generate something that was sufficiently defined to attract funding but not so constraining as to prescribe what was clearly a new and exploratory relationship. Interestingly, the Smash Palace funders opted to support the *Mountains to the Sea* proposal, specifically for its open-ended approach to the collaboration.

5.3 Changing personnel

Cohen (2000) noted that the way in which people first become involved in a project affects their feelings about the project later on. This was the basis of a second strand of learning about the entry and contracting phase which emerged through the changes in personnel. We found also that personnel changes had ramifications for all team members.

Two significant personnel changes occurred. One artist was replaced by another when the proposal was nearly completed and before it was submitted. Then one scientist pulled out after the proposal had been funded, but before the project team met. After a flurry of email debate and two team meetings, a third artist was brought into the team, primarily to provide an iwi voice. These two individuals had very different experiences of coming into the team, which resulted in quite different outcomes.

The first new team member spent much time in private interchange (thus hidden from the team) with the other team artist and scientist in Nelson, talking about the project and its history. In comparison, the second newcomer was primarily briefed by the artist who was newest to the project, hence did not get the same quality of introduction from someone well grounded in the origins of the proposed collaboration.

The team were unaware how far they had come in the entry and contracting process, or how much effort was required to retrace steps so that the second newcomer could feel more comfortable and familiar with the project. The existence of what is essentially tacit knowledge and not easily articulated, therefore, indicates the need for considerable conversation around the project rather than more briefing about what the project is. The need for this kind of conversation points to the value of personal relationships in a situation such as this because people who want to spend time together in conversation provide the 'oil' which greases the wheels of a group's function. This need is accentuated when a newcomer is brought into a functioning group.

Added to this, the team as a whole were unclear about their own roles and therefore unable to give the newcomer clarity around his particular function. Hence, despite efforts all round, with the newcomer trying several avenues of action and making valued contributions during the dialogue phase of the project, the fit was never comfortable and he decided to leave the team. In line with the conclusions of Ross and Nisbett (1991), and contrary to what many Westerners intuitively think, situations would seem a greater influence

on behaviour than personalities, values or attitudes. Had we had a particular job or clear role for this person, or been more aware of conversations and work required, it may have been easier for him to join the team and for the team to manage the changes around that process – or perhaps not bringing him into the project at all or at a later time when we all saw a clear, concrete need.

While the remaining team felt this personnel trouble as a failure, it had acquired sufficient strength of connection and purpose to have no question about continuing with the project. Furthermore, the attempt to integrate this late team member into the project, despite its difficulties, had some positive sides to it. As one of the team later commented:

[X] caused us to think again about what we were about and to do different things. We had got quite comfortable together but when [X] came we had to reassess things...In some ways his leaving the team was the catalyst for getting the rest of us closer together.

Overall then, the 'snowball' introduction of team members prolonged the entry and contracting phase. Members who entered the team after it had completed some of its tasks had not shared the relationship-building experiences of those who took part in the first meeting. A key message for the participants in the collaboration was that establishing and developing relationships and roles is a more difficult task for those that come into an established team than it is for a new team who have not yet established their patterns of behaviour and interaction. The effort required to bring new people into a functioning group, particularly one trying to find its task, is significant.

Teams bringing in new people can benefit from thinking about roles and systems (do we have a clear role for this person, or if not, do we have the time and self-awareness to fill this person in on what has been and is going on here and how this group is functioning?), timing (might there be a better time to bring in this person?). Introducing new people needs to be conducted with sensitivity on the part of the team who,

after all, have the advantage in terms of knowledge and group support. The path of any newcomer is not an easy one and the challenge should not be underestimated.

5.4 Starting out on the *Mountains to the Sea* project

The first face-to-face meetings dealt with the principles of the collaboration and the team discussed some protocols for working together. These included:

- Any decisions that might involve contractual constraints must be made by the team as a whole.
- Every effort should be made to keep team members informed about ideas and developments.
- We need early notice about the organisation and agenda of any meetings.
- We need to be mindful of fostering opportunities for informal interactions (particularly when team members are visiting their non-home locations).
- We must work to build networks and information, about who knows what and who knows whom, that might be useful in some way.
- We will aim to have a conference call at least every two months (and possibly every month) in which all team members participate, as a form of reporting back and discussion.
- We need to be mindful of our differences and aware of possible friction but to work it through by communicating concerns with respect.

Although these protocols were not formally reviewed during the project, they were recalled at various times by team members as reminders or checks on the collaboration. There were times when we did not manage to meet these objectives. For example, the team did not always manage a conference call every two months and did not always achieve early notice of the organisation and agenda of every meeting. However, these 'rules' were generally followed.

Had the team more formally reviewed these protocols there may have been others developed along the way. For example, the team was interested in maintaining balance between

science and art in the project, a point they returned to frequently. In addition, interactions between individuals were also important and at times might have been improved with more conscious acknowledgement of the importance of those phone calls and conversations.



Conversations at the Travelling River Exhibition

6. Information Sharing – Getting to Know One Another

In Wood and Gray's (1991) synopsis of key aspects of collaboration, the nature of the collaboration itself, its characteristics and purpose come foremost. The defining flavour of any collaboration clearly affects the processes that evolve in response. The nature of the collaboration that brought together the team of the *Mountains to the Sea* initiative had four significant aspects.

- 1 This was a collaboration of artists, biophysical scientists and social researchers – a double dose of interdisciplinarity with all the added complexity this offers. The implications for a project of this nature are that significant steps were necessary to elicit even-handedly and integrate the contributions of all. The team in various assessments of the process and outcome reflected on how well this was achieved.
- 2 The team were split geographically with three members based near Christchurch and three in Nelson some 400 km away. This added to the complexity of the collaboration and had mixed consequences for the process, and the experience of the participants. However, the creative response to this situation was ultimately the basis of one of the significant outputs of the collaboration.
- 3 The *Mountains to the Sea* collaboration was voluntary, loosely bound by funding requirements, and unusually open-ended. We started out as a group of individuals who had to decide on their own outcomes, rather than having a clear outcome from the outset, which increased the complexity of the collaboration.
- 4 The previous experience of collaborative endeavours of each of the participants affected the collaborative process. This was the first major collaborative work for at least one team member. Furthermore, as few collaborations become truly interdisciplinary (reaching instead the more accessible target of multidisciplinary), the whole team had to explore new and complex territory.

This section is about the process of dialogue and working through the complexity. It was the stage of getting to know each other – finding points of commonality and of difference and working out how to fit them all together, so that the team could become a productive unit. Once again this *information sharing* phase took significantly more time than we anticipated and was not something that could be easily short-cut. This was also a time when the team returned to the need for balance and reciprocity in the relationship between artists and scientists.

6.1 Understanding difference

The team aimed to achieve an interdisciplinary rather than multidisciplinary approach to a shared issue. This approach contributed to the complexity of the project and required participants to critically examine their potential to 'essentialise' or stereotype one another. An example of the facilitation that helped us negotiate this took place at the pre-proposal workshop during the introduction phase of the meeting. Participants were invited, during dinner, to present themselves to the whole team, prefaced by some comments on what they thought artists or scientists were all about. This exercise was humorous and yet revealing of standard prejudices and assumptions. It not only 'broke the ice' but also served as a first step in finding common ground or interesting and intriguing differences. Declaring assumptions openly removes some of their potential to erode relationships.

This work continued within the project team. Fitting into three neat groupings as artists, scientists and social researchers, it was easy to assume broad characteristics were shared by each pair. Naturally, great differences in personality and experience existed and the team members contributed as individuals rather than stereotypes and could have significantly divergent views, values and approaches. As one of the artists expressed it 'we [the artists] *were not joined at the hip!*'

Participants in the pre-proposal workshop also discovered a number of points of similarity between artists and scientists. As one science participant wrote after the workshop:

An adventure in thought, without ever leaving the road. Art and Science. Chalk and cheese? In many respects, necessarily 'yes'. But within many scientists lies closet artistry and within the artist an enquiring mind. We discovered shared traits: [both] challenge the status quo; [both value] innovation and lateral thinking, risk-taking and dealing with uncertainty; [both] plunder available knowledge and ideas – and build on them; willing to embrace technology where it helps; agents of change;...[both are] passionate and committed.

This discovery of commonalities continued through into the project. It was during the first project meeting that the scientists learned more of how artists work and for some it was a revelation. One commented:

My perception before was that artists 'just did things', so it was quite a new idea for me to see how structured and logical an approach they took to creativity – and the parallels with my own work as a scientist.'

6.2 Building conversations

Dialogue and information exchange began with the pre-proposal meeting. Here, participants sowed the seeds for the growth of a 'common language' around the collaboration. At one stage, for example, they spoke of 'ping moments' – moments of inspiration when both scientists and artists recognised a point of clarity and vision. The idea of a good collaboration was to produce and share these moments.

Having developed the proposal in a way aimed at maximising those 'ping moments', the project team had a large and complex task trying to conduct open dialogue together without any clear end task. One of our ways [as social researchers] of understanding the progress through this phase was to imagine the participants in the collaboration were all scattered in a wide field covering the whole potential of art and science collaboration, the huge concepts of integration, the *Mountains to the Sea*, and working with communities. To begin with, the participants began shouting to each other across this landscape, gradually circling in closer to one another and into a smaller more defined area. As they drew

nearer to one another the participants stopped ‘sussing each other out’ and started to focus on what they were collectively working on.

One team member described the goal of the early team meetings as follows:

What we were aiming to do... was to find ways to move forward in conversation – to find ways to talk to each other in a way that helps us build understanding so we can work towards ‘something’.

Ultimately in such open-ended collaborations as the *Mountains to the Sea* it is useful to recognise that initial work is equivalent to the research and development phase of a project. This phase could be shorter when the end product is defined and the roles of the participants are clear-cut. However, it is an unanswered question to what extent the latter kind of collaboration would generate significant new learning for the participants, or enter new territory in art and science collaboration.

6.3 Conversing across geographical distances

At the Smash Palace project review, the *Mountains to the Sea* project explained the three ways in which they conducted their interactions as face-to-face, ear-to-ear, and eye-to-eye. This referred to conversations conducted in meetings, on the phone, and via the shared Web-based workspace. In the *Mountains to the Sea* collaboration, all face-to-face meetings involved shared meals. Such informal interactions are commonly recognised as important starting places for building trust and the level of familiarity that is crucial to meaningful dialogue (Winstanley et al 2005.). In addition, the hospitality of one of the Nelson members to the visiting Lincoln team members played a significant role in cementing the partnership.

However, with busy individual time schedules, two different locations for team members, and a limited supply of financial resources, it was clear from the beginning that face-to-face meetings would not be as frequent as desirable to progress

the project. The way in which the team responded to this was to conduct an ‘online dialogue,’ which became a fluid exchange of thoughts that undoubtedly contributed to the connection of the team members and their grounding in the project. An unintentional consequence was that the capturing of these ideas itself became an output of the collaboration – an edited collation of entries from the online dialogue entitled *Conversations about a River*.

The problem of the distance had undoubtedly sharpened the creative response of the team in acting to address it. Guidelines on how to participate in the written web-based dialogue were discussed by the team, but not all members found the translation from verbal to written communication easy. One science participant speculated that he was used to being cautious and accurate in his written work and could not easily adapt to a free-form stream of consciousness as was achieved by some of the other participants.

Conference-call phone conversations were also important in bridging the distance, and often led to more contributions appearing on the website. Some team members even found themselves ringing each other up to discuss the ideas on the website. Email, too, was much used and at times it was an effort to remember to put such discussions onto the website to be shared by all. There were times when the email and telephone ideas were never translated into notes on the website.

This mix of methods for communication was important and to some extent mirrored what happens in groups working face-to-face. Not all work is conducted with the full team in face-to-face work. Often individuals will take off in pairs or threes and just chat about some aspect of what is going on, and this flexibility is important to maintain.

Despite the success of the web-based dialogue, there were drawbacks to it. Such a medium meant that responses were delayed or that there was no response at all to an idea because nobody was looking on the site. As the site grew, it became difficult to explore all that was going on in different parts of it

and it was easier to miss new contributions. Thus, participants felt the face-to-face interactions were very important in grounding and uniting the team and that these were held too infrequently. We noted that the activity on the web-dialogue would always be greatest following a face-to-face meeting. As one participant said the infrequent meetings resulted in a ‘stop start’ feeling to the project and further added, ‘*Collaboration is quite a social process. Lack of resources for face-to-face engagement was a problem.*’

6.4 Balancing science and art

The idea of a balanced contribution between artists and scientists was critical to the *Mountains to the Sea* project and a fundamental platform of the collaboration. The aim was to be a coming together of creative inspiration, neither wholly science nor wholly artistic in origin. While early concerns had been that the artistic contribution would be subservient to the science, as the project progressed it became apparent that the artists in the project were firm in their identity, and the scientists were less clear about their potential contributions. One of the scientist commented:

I think we (the scientists) saw we had plenty of science to contribute, but I thought that this would always be a contribution towards an art work, or art-science work, but not a science work.

This assumption, that the work would be primarily an art work or an art-science work, appeared to run through the team as a whole, and as facilitators we realised early on that it was sometimes difficult to see the role of the science in the dialogue process. This perceived lack of balance, alongside the team’s continuous enquiry into what good ‘sci-art’ would be like, sometimes led to questioning whether the team make-up was the best to achieve the aims of the collaboration.

One scientist felt that the balance between artists and scientists did not seem right. He attributed this to the number and choice of the scientists in the team *I am not sure if we had enough biophysical science representation... [the team] might have been better with ‘real scientists’* (the team member

considered the scientists involved, including himself, to be more management than research focused). The same team member went on to comment on what he considered to be a critical personnel choice, which was the involvement of one of the artists who had strong links to the science world.

It may be that we, as social researchers ourselves, are underplaying the contribution of the thinking of the scientists, which is critically grounded in Western rational thought, and was consequently a unique contribution to the art/science mix. However, if, as some considered, the work of the team was ultimately more 'artistic' than 'scientific' in flavour it remains a question as to why this was so. It is difficult to separate whether it comes from the personalities involved, how much it is related to the ambitions of the team and what emerged as the strongest themes, how much it depends on the structure and facilitation of the collaboration, and how much it is a common function of SciArt collaborations, as some other authors (e.g. Cohen 2002; Webster 2002) have suggested.

7. Project Planning: Deciding on 'the Work'

The team were committed to producing something from our work together, and for some individuals (the more task-focused particularly) there was a notable growing impatience to define this. The end product could be anything from a scientific report that included an artistic interpretation, an artwork that included some kind of science input, a series of art works or art proposals that included some kind of science input, or even something else not yet imagined, but which included some aspect of both art and science.

We noted earlier a tension between process and task, and the process of deciding on and defining a task. This tension reached its peak at the end of the dialogue phase. The challenge for the facilitators then was how could we build a response together as a group? For people used to working

on their own, having to take ideas back to the group and having to build ideas with others (and possibly having to argue and compromise) took time, resources and effort that might otherwise have been put into a tangible project. As one person put it, '*it felt like walking through deep mud*'. The value of this was, for some, easier to see in retrospect:

I found the conflict least enjoyable – came up against brick walls. At the time this bugged me because of the time delays but when I reflect back I see we needed that.

Thus while developing a dialogue was considered as important as producing an end product from the collaboration, the focus shifted during the project towards defining, scoping and developing this end product. By this stage in the group process, the artists clearly had the strongest sense of direction – something which was encouraged and to a large extent relied upon by the science team members. The concept of working on some form of primarily artistic output (an installation or exhibition) was the most comfortable working basis for all team members. No proposals for a collaborative work that had an essentially science-related function were ever put forward.

Deciding on what to do as our major output became one of the most difficult aspects of the collaboration to facilitate, and for the social researchers there was some confusion over our role as team members (contributing, developing and supporting particular ideas) and process facilitators (ensuring that all ideas were heard and considered). Inevitably, we had to choose a direction and that direction held some sense of loss for team members, since not all of the ideas generated could be incorporated.



8. Implementation

The geographical split and distance between the two locations of team members became most significant during the *implementation* phase when *Travelling River* was prepared. The team effectively split into two groups. Those who lived in Nelson, where the exhibition was to be held, by necessity took on the highly intense job of constructing the work. Those based in Lincoln, due to distance, personal time constraints, and the time line of the exhibition itself (dictated by the availability of the gallery space) were unable to participate to any great extent in implementing the project. This meant that for this phase of the project there was a clear outcome, a clear set of roles for the three people involved to take on, and the geographical split was no longer a factor. Overall the collaborative process became much simpler – and it had to be because of the sheer enormity of the task that the group had agreed to take on.

The work conceptually was to unite images, interpretations, and understandings of the Motueka River as seen by the community and the scientists who worked there. It included interviews to collect stories and the scanning of precious family photographs. The design of the work rested primarily with one of the artists with previous experience in art installations. However, the engagement with the science community and the residential community of the Motueka Valley, a significant and integral part of the work, relied heavily on the networks of the second artist and the resident science team member.

8.1 Preparing the *Travelling River* exhibition

The process of collating images and voices to interweave in a story about the catchment required the three team members to work creatively and intensively to identify contributors, to collect contributions and to elicit stories from community members. The successful completion of the exhibition in the tight time frame was a tribute to the way in which the threesome from Nelson worked together.

The *Travelling River* exhibition opened for three weeks on 7 August 2004. A catalogue from the exhibition (Mountains-to-the-sea project 2004) documents the form and processes

involved in developing the exhibition and these are summarised as follows.

The intention of the exhibition was to explore life and science in the Motueka River Catchment and out into the Tasman Bay, where the impacts of the Motueka River are still felt. The installation consisted of 24 panels. Each panel presented intersections of community photographs and images from science research themes. These were organised around extracts from poet Cliff Fell's work in progress 'Motueka Song'. Included were the voices of the contributors of the images, scientists and local people, captured as comments on the image, their work and their life in the Motueka.

To prepare this exhibition the exhibition curators used their networks in the Motueka to reach into the catchment and gather the visually captured insights of the world living and working there. They collected vast numbers of potential contributions and spent many hours sorting these into coherent and evocative themes. All contributors were invited to the exhibition opening. During the weeks of the exhibition floor talks were held and participants were invited to engage with speakers to uncover the connections and interactions between the geographic, historical, human and landscape themes presented.

8.2 Collaboration during implementation

All three participants in this phase of the project spoke of the very high intensity of the work compiling and building the exhibition. One described it as being in a small boat on a very big rapid where there was nothing to do but pitch in and paddle furiously just to stay afloat. This metaphor also highlights the close bonds that developed further within the group during the few months leading up to the exhibition opening – as the three negotiated their way through the myriad decisions and problems that arose.

The three operated and thought through problems very differently. This gave the group the variety of skills and strengths needed to complete the task at hand. Group members also referred to the importance of the earlier phases

of the project in helping them get to know each other well on a working basis. This meant that there was little need for negotiation around where people's skills lay and the roles that each took more or less just 'fell into place'.

One group member was highly skilled at eliciting stories from community members of many different walks of life. Her local networks, her ability to connect with people at the heart, and her warmth were all instrumental in building a sense of ownership amongst the community in contributing to the quality of the photos and stories that appeared in the exhibition. Another group member also had very wide networks, having grown up in the area, and spent a great deal of time talking to people and collecting photographs from them. The third group member contributed less in terms of interviews and collecting photos but focused most of her time on the huge task of designing and building the exhibition. Their shared senses of humour and passion for the project helped bind them into a highly productive team.

Points of tension did arise. Despite a shared passion for the project, occasionally a team member would have to bow out briefly to spend time with family or just to recover themselves or attend to other work required of them. In times of high pressure, this can provide a point of tension both for those left continuing the work and for those who feel guilty for taking the time away from the project. Points of tension also occasionally came up because of the different working styles of the participants. However, overall, the points of tension were relatively few given the enormity and intensity of the task at hand.

9. Review

There are three ways in which the *Mountains to the Sea* project team have evaluated and critiqued their own performance. Firstly, and to some extent most crucially for the project itself, the team involved itself in many conversations, one on one, or with the group as a whole, assessing direction and process. Secondly, we two social researchers have worked together with the group to produce this assessment of the collaborative process of artists and scientists working together. Thirdly, the team informally gathered feedback on the impact of the major work – the *Travelling River* Exhibition, and compared this to the goals they had agreed upon on the outset, although this was inevitably retrospective – a kind of hopeful 'how well did we do?'. The information the team gleaned was useful to their collective learning as to how they would carry out any other similar initiative in the future.

9.1 Feedback on the *Travelling River* exhibition

The following reflections came from discussions among the team members a few weeks after the exhibition was shown at the Suter Gallery. Some team members actively sought feedback from friends and community participants and a few interviews were held with people outside the team. Some useful learning and questions have emerged from this process, which this section outlines. The process of seeking feedback from others on the exhibition contributed further outcomes of the project. Visitors to the exhibition reflected on their experience of the exhibition in ways they would otherwise not have done, which in the words of one of the artists '*gave it more life*'.



The goals of the *Mountains to the Sea* project included exploring the process of integration – including integrating science and art, integration within the Motueka catchment, and integration of the community with the catchment. In addition to these overarching goals, there were others. One of the artists felt that the objective of the project had been to expose and reveal, rather than argue or critique. By doing this, she felt that the exhibition had provided the opportunity for community members to reflect on their impact on the Motueka Catchment without telling them what to think. Another artist felt that what we did was provide a portrait of the catchment and to portray it as an entity with a spirit. The process was part of honouring it, honouring peoples' connections with it, which helps make people proud of it and their relationship with it, which will eventually help us care for it better. The science leader wanted an iconic 'work' that would highlight the role of Landcare Research and the Integrated Catchment Management science research programme in the Motueka Catchment. For those of us able to attend the opening night, there was distinct satisfaction at seeing the different community participants and their reactions to seeing themselves in an exhibition, and at the way in which the exhibition had turned out. For all involved there was a sense of having achieved our goals as a team and this must therefore be highlighted as something of a success.

As might be expected the exhibition received both positive and negative comment from those outside the team. Some people we spoke to described it as 'boring'. Another individual was reported as saying that the exhibition did not work as a SciArt project because it kept the art and science separate and didn't bring them together well. A Motueka Valley resident who was also on the Board of Landcare Research felt the exhibition should have had a stronger message about the need for sustainability. Ultimately, some artists said 'where is the art?' and some scientists said 'where is the science?' Despite these comments, there was a tremendous positive response to the exhibition. It appears that one of the greatest successes was the community participation aspect of the project. In general, the people of the catchment received it very positively. These may all be valid criticisms or accolades,

but they are comments made from the 'outside' without an understanding of the project's goals and limitations. It is also difficult for us to comment on the quality of the art, the science, or the SciArt. The following discussion therefore reflects on those things that we can comment on – those things that were important to us as a team working on the *Mountains to the Sea* project.

9.2 Involving the community

A clear goal of the *Mountains to the Sea* project was to involve, reveal and honour the community associated with the Motueka Catchment. As such, the exhibition provided a range of ways in which different people could engage with it (e.g. sound, written words, pictures, floor talks). Many people connected more easily with the pictures while others engaged more with the captions. For example, one of the artists told a story about a friend who said that initially he felt the exhibition did not pull him in, but that once he engaged with the captions he was captured by it. Both aspects were an important part of the exhibition; However, one team member said that those who thought it was not art were judging it that way because of the written words. This made them feel it should be something exhibited in a museum rather than an art gallery. For those people, it seems they saw the captions as information rather than as an art form themselves.

This observation points to the importance of the photograph captions as a means both to engage observers and to reveal things about the participants. It is not surprising, then, that the project team had considerable discussion about the captions/stories that accompanied the photos. One team member felt that some of the captions 'lacked authenticity', which she put down to a problem with too much of the curator's voices. This resulted partly from the time constraints faced by those working with community participants and it would have been better to spend more time working up the captions. Another team member felt that many of the captions were too prosaic. However, as another member pointed out, there is a tension between wanting to capture stories and feelings and the truth of what people see in their photos. The prosaicness is a characteristic of some of the community

participants and that in itself reveals something about them. This tension also might have been less if there had been more time to spend drawing out or, perhaps, revealing more of the people behind the photos.

Another small question that emerged from the work was that of depth versus breadth. The exhibition was very broad, which most of the group felt was true to the original theme of *Mountains to the Sea*. However, some interesting lines of enquiry might have been followed if there had been an opportunity to drill down more deeply. Another benefit of the 'broad' approach was the involvement of many more people – a stated aim of the project proposal.



Visitors to the Travelling River Exhibition

9.3 Community linkages

Noble and Jones (2002), reflecting on a photographic exhibition that depicted the lives of cleaners, noted the community development function of community art projects. This exhibition also has had some effect on the community of people who contributed to it. Two thousand people came through the Suter Gallery at the time of the exhibition. Two to three hundred people came to the opening and many of these were very different people to those that normally visit the gallery and attend exhibition openings. Gallery manager Helen Telford commented in her opening talk about the way in which this exhibition was contributing significantly to the Suter's objectives of engaging with the local community, and the exhibition undoubtedly forged some new networks for the Gallery.

Other new linkages also developed as a result of this exhibition. As one of the curators reflected after the event, the greatest value came from the exchanges with people and the recognition of someone else's significance through the exhibition process. She also felt that the exhibition provided a good medium for revealing some aspects of a Māori perspective on the catchment. The same person also recounted incidents where people who had contributed photographs and stories met and talked to each other in front of the screens displaying their contributions. For some of these people, they had not realised their connection to one another before.

Another outcome of the exhibition came from comments made by Tasman District Council staff to one of the scientists. They were pleased at the way the exhibition had showcased their contribution because the role of council science staff often went unappreciated. They said it had been worth being involved, and some of them had talked about enjoying thinking outside their normal square.

No evaluation of a community project would be complete without some analysis of who was not included in it. One of the artists felt that this exhibition did not include people who were not landowners, so there is a contingent of workers in

the catchment that were not represented in the exhibition or in the information gathering and linkage building. Our focus on photos eliminated people who don't take photos. Many of the people in this category would be marginalised, poorer groups. Also, the local Māori community had few of their own photographs of their involvement in current environmental projects. However, our interest in including them meant one artist went out to take photos and collect stories to go into the exhibition.



Collecting images and having conversations with residents of the Motueka Catchment

9.4 Outcomes for the project team

As social researchers, we are inevitably interested in the question 'have we changed through any of this?' Throughout the collaboration we encouraged project members to reflect and critically review their experience. A midway evaluation was also conducted before the project presentation to the Smash Palace funders in March 2004. Participants reflected on the process, the end results, and the aspects they thought contributed to and detracted from their experience. The questions we asked in that evaluation are in Appendix 3.

The principal collaborators in the *Mountains to the Sea* project undoubtedly looked for something transformative from the experience. Whether they anticipated this transformation

would take place internally or externally to themselves varied from person to person, but the essence of discovering a new way of working together that would result in something neither completely scientific nor completely artistic in origin was shared by all.

The artist who had been involved with the collaboration since the first meeting spoke most enthusiastically about the benefits and uniqueness of her experience, particularly around the openness of the collaboration partners.

Being human, exposing vulnerability has been important. We are learning together, and that involves risk taking. Risk taking is not easy and it builds relatedness as well as brilliant moments of inspiration and vision.

However, participants overall found it hard to identify any particular contribution working on the collaboration had made to their own work outside of the project. One science participant stated that while he rated the experiences of learning how artists worked as one of the most enjoyable aspects of the collaboration, otherwise

...it hasn't been a meaningful, life-changing experience. I did become more aware of the need to listen a bit more... The learning from this is not informing projects now but may do so in the future. I am looking at the river from different perspectives... a wider lens.

A number of the participants rated the social interaction highly and also expressed their reactions to working on something outside their normal range of activities and the effect this had on their work in the group. One person commented:

I felt the luxury of this being off the track to what I normally do – so to some extent I didn't have the same stake in it as I would my own piece of science – have got it now though, interested to see where it all goes. Got hooked on what we are doing along the way.

10. Conclusions

Other benefits perceived by participants in the collaboration were undoubtedly the expanded networks and changed perspectives. In the case of some of these participants it has whet their appetites to pursue more work in the area of art and science collaboration. Perhaps most importantly the project team were all interested in working together again on a new project. This small observation speaks volumes about the success of the overall collaborative process.



Traveling River takes Maggie and Andrew to 'Desire Lines' Art and Ecology symposium, Dartington U.K.

As one of our colleagues reminds us regularly, *this project was a blast*. The team had a lot of fun, learned a great deal about all manner of things, and were part of producing outputs of quite a different nature than as scientists or as artists we usually get to do. In addition, the team achieved everything it set out to do. We built collaboration, participated in an open dialogue to learn about SciArt, and completed an exhibition that brought together the perspectives of different community members including scientists with an interest in the area. The Suter Gallery was surprised and pleased at the variety of people that the exhibition brought into the gallery. The exhibition was taken further afield so that more of the community could come in and see it. Overall, the *Mountains to the Sea* project can be judged a success based on the things that we set out to achieve. Team members (ourselves included) feel very positive about the experiences we have had working on this project and most have expressed interest in being involved in another SciArt collaboration.

Essentially collaboration is about building relationships and working with other people in a way that utilises the contribution of all group members on a roughly equal basis. We found, as many others before us have, that it is as much an emotional process as it is a rational one. It involved times of great laughter, joy, discovery and excitement. It also involved times of particular difficulty in which people felt frustrated, angry, and sad. As facilitators and as participants we experienced the whole range of emotions during this project as did the rest of the team.

Because we are interested in learning about the collaborative process, we are left with the unenviable situation of having to focus on the negative aspects of it as much as on the positive. Most of our learning, in fact, arose from the more difficult aspects of the project – from the things that did not go as well as we would have wanted. Thus, throughout this report we have highlighted these because these are the places where the lessons lie for us. It has been an uncomfortable process essentially focusing on the negative, when other team members finished the project on a high note and have largely

forgotten the hard bits. They have thankfully made us redress the balance to include the positive aspects of the project but here at the end we must return to the negative once again and pull out of that the lessons that might help others work through their own difficulties in other collaborative work.

As facilitators, we take away a number of lessons that may be useful to groups dealing with similar complexity. First, we would probably pay more attention to the early phases of the next collaboration. During *entry and contracting*, we cannot emphasise enough the utility of talking *around* a topic rather than trying to accomplish anything in particular with it. When new people come into a collaborative group, particularly a group which does not have tasks and roles set out clearly, there is a lot of tacit and unexpressed knowledge to pass on before that person can feel comfortable. For people coming in to such a group, it would pay to remember that it is no easy task, and that finding opportunities to converse with group members and taking time to observe group structure and function is time well spent before trying to contribute. As one team member pointed out, it is important to connect with the heart before moving on.

We severely underestimated the effort required to bring people into the collaboration after the process had begun. The work of bringing in the first 'new' person was hidden from the group and was carried on the shoulders of one individual. Much of that 'work' was disguised by the fact that the two of the people concerned were friends who enjoyed the opportunity to interact and the project gave them reason to do so. However, the hidden nature of this work meant that as a group we were all unaware of the time required to help that person fit into a group that had travelled a considerable distance together. This observation is testament also to the amount of learning that goes on almost unconsciously when a group of people work together on a joint project. During the early stages of a complex project, it can feel a little frustrating that little apparent progress is being made. However, what we experienced here indicates that in fact very large amounts of information are exchanged and assimilated by participants.

We suggest that it is best to see phases of group development as part of an ongoing series of iterative cycles within the collaborative process. This is the basis of an adaptive approach (also known to those in organisational development as a continuous improvement cycle). While we set out to learn specifically from this process by reflecting on it, it appears that we could still have been more systematic in thinking about what we should reflect on and how those reflections might help us build our understanding of what we were doing together. For example it may have been productive to revisit the protocols that we developed to guide our collaboration as that collaboration progressed and we realised the importance of new elements. Looking back now it seems surprising that we never did this – however, at the time we tended to focus more on what was happening then rather than stepping back to take the longer view of our process.

The dialogue (exchanging information) part of the project took far longer than anyone imagined when we were writing up our proposal, a fact that put the group under considerable stress as resources became more stretched. This phase was essentially a research and development phase. The greatest need that we had during this phase was for face-to-face meeting time. Progress through this phase might have been improved had we defined roles within the group as some SciArt projects do. However, this is not a good way to foster individual growth and development. To do this the freedom to define new roles is important as is the facilitation process used to support the collaborative process. A group that has not defined their roles up front require considerably more facilitation than those that have.

Our collaboration split at a critical time as we moved from a focus on defining a task to completing the task. In some ways it's as if some participants had been 'champing at the bit' looking for the finish line and then when the finish line appeared and the gates opened there was simply no stopping the bolting horse. As facilitators, we 'dropped the ball' once work began on the *Travelling River* exhibition. In retrospect, we should have looked for a way to complete this work that was more inclusive of all group members.

It became clear, particularly in the planning and implementation stages of this project, that the people who came into the process with an open agenda actually got less out of the project. Being open can make people more vulnerable to the actions of those who are more focused on personal goals. This is not to argue that people should or should not come into a collaborative process with clear personal goals. Rather, we learned on reflection that it is important to notice who the most open members of the group are and to find ways of protecting that vulnerability, perhaps through the thinking about this as part of setting up a collaborative protocol. As a corollary of this, in an already stretched project, it is not a good strategy to build in a tight timeline to try and get something done. The extra stress simply disrupts the collaborative process. Collaboration takes time and effort and when time disappears from the mix, problems arise.

Having social researchers in the group alongside artists and biophysical scientists seemed to help the group be more aware of issues. It was also clear during the session in which a presentation was made back to funders that our team was the only one immediately able to answer the questions that the funders asked about the process of collaboration. Social researchers can also provide important input to the group process particularly where there is to be considerable depth of inquiry and challenge to people personally. In this facilitation role it is important for action researchers to be independent of the outputs of the collaboration. In our case it is possible to argue that having two of us on the team allowed for both looking after the process and contributing to the tasks with which the group was involved. We (the social researchers) feel it would be a shame for social researchers to always be relegated to the position of facilitator when there were interesting discoveries and synergies that emerged from participating as part of the group. In other words we believe social researchers should feature as science participants alongside biophysical researchers in other SciArt projects, and in this we are supported by other members of the group.

Change takes intention, knowledge, time and practice. In

this project as in others around the world it was difficult for scientists to say how the project had changed their science. Science, particularly biophysical science, is a much more prescribed endeavour than art. To change one's science is a major undertaking given that there are ways in which science is policed and that scientists are very clear about what constitutes science. This is less the case with art where there is a great deal more debate about what art is and therefore there is more freedom to try new things. The scientists in the project were changed by it – even if only through learning some more about art and collaboration. The changes will almost certainly remain hidden in the thought processes that go into developing science proposals rather than in the way science is done. However, like the artistic process, developing science proposals can hide much of what it is that has contributed to the thinking. In addition, if you want scientists to be changed by the experience it is clear that one small cash-strapped project is unlikely to provide the means for that to occur to any significant extent.

It is a difficult and time-consuming process to get true interdisciplinarity within a project group. In research teams multidisciplinary is more common. In multidisciplinary projects, each scientist works on a project in their own discipline that may or may not contribute to the overall picture of the part of the world under study. For good integration to occur there must be a much greater exchange of information so that the group as a whole can look at a problem or a question and interpret it from a new group perspective. Thus in many ways the end of the collaboration left us with the same question we began with. What is SciArt and how do we do it? What is integration? What is interdisciplinarity? These questions still remain but we have learned a little more about working towards those goals.

A question that emerges for us as facilitators, then, is how can we help all group members to maintain their sense of involvement, and how do we build an awareness of this need into the group as a whole? It may also be that as facilitators we need to understand more about the process of changing from a process to a task focus in groups that must decide their own task.

11. Acknowledgements

The newness of the SciArt field meant our early searches for examples left us rather wary. SciArt seemed to be full of examples of science using art for public relations or science being commandeered by artists for the 'neat shapes' it produced. The *Mountains to the Sea* collaboration began with an intention to pursue an equal and meaningful partnership. There was a clearly articulated commitment to respect and to understand the profession that each brought to the project. In the absence of clear guidelines from elsewhere the group defined for themselves the nature of a SciArt collaboration as being neither art nor science but 'something else', recognisable by its integrity. There seemed to be a hope that we would 'feel' our way towards this and know experientially when we had arrived.

Although this was undoubtedly a struggle and at times clearly fell short of our expectations, what we did achieve was a thoughtful cross-disciplinary exploration of integration and collaboration, an exhibition that brought together diverse groups in a community and which clearly had both art and science thinking in it, personal changes for the participants, and some learning on how we would go about it all if we did it again. This would seem to be a good set of outcomes from the *Mountains to the Sea* project.



The SciArt Team (minus Chris Phillips) is helped out by Bruce Thomas at the set up of the *Travelling River* Exhibition

The authors would like to express their gratitude to the members of the *Mountains to Sea* Team, Suzie Peacock, Maggie Atkinson, Andrew Fenemor and Chris Phillips, for their thoughtful and frank observations about their process and work. We would also like to acknowledge Gavin Hitchings and Barbara Stuart, both of whom contributed useful feedback to the authors on the *Travelling River* exhibition. In writing the report we were helped considerably by Will Allen who looked over a number of drafts and Christine Bezar whose constructive editing just when we had thought we had seen enough of it, saved the day. The report is in the splendid format it is now thanks to the graphic design work of Cissy Pan. Finally we would like to acknowledge the support and vision of David Penman, who took the radical step of ensuring social researchers were part of the art and science collaboration team.

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Appendix 1 Core team members in the *Mountains to the Sea* project

Andrew Fenemor	Leader of Landcare Research's Integrated Catchment Management Programme in Nelson, with a background in hydrology and resource management. Science leader of Mountains to the Sea.
Maggie Atkinson	Landscape architect, artist and formerly involved in environmental science. Artist leader of Mountains to the Sea.
Suzie Peacock	Artist, Art & Design Programme Leader, Nelson Marlborough Institute of Technology.
Chris Phillips	Scientist, Landcare Research, with interests in knowledge management, erosion processes and slope stability and sediment delivery to streams.
Chrys Horn	Scientist, Landcare Research, with interests in participatory processes, participatory evaluation, and resource management.
Margaret Kilvington	Scientist, Landcare Research, with interests in participatory processes, participatory evaluation, and integrated catchment management.

Appendix 2 Understanding collaboration

Some of our current theoretical understanding of collaboration is outlined below. The characteristics of an ideal collaboration as they have been discussed in the literature are summarised first. Then, we outline Atherton's (2003) work highlighting the effect of not having a concrete outcome decided before collaboration begins. Finally, we outline the Integrated System for Knowledge Management Model (Table 2 of this report; Allen et al.2001b) which suggests distinct phases in a complex collaborative process.

A Characteristics of collaboration

In the quote at the front of this report, Minnis et al. (1994) identify some defining characteristics of an ideal collaboration. These include that participants contribute their complementary expertise equally; share authority, responsibility and resources; and that the collaboration promotes a learning experience from which participants can assess and challenge existing assumptions and ultimately work together from a place of renewed and shared theoretical standpoints. Furthermore, adapting Wood and Gray's (1991) literature review of collaboration theory, we suggest that the following aspects of the collaboration will be important features of SciArt collaborations.

- 1 Purpose and characteristics of the collaboration.
- 2 Auspices under which the collaboration was convened and the role of the convener.
- 3 Implications of the collaboration for complexity and how this is addressed.
- 4 Relationship between self-interests and the collective interests present in the collaborative alliance.

Minnis et al. (1994) suggest that those working in collaborations may not always (or even commonly) experience dizzy heights of synergy, but they may be working constructively towards improved collaboration and producing shared outputs that reflect the benefits of the collaboration. Despite this, recent writing in the field of SciArt (Campbell 2002; Cohen 2002; Webster 2002) is questioning both the quality and the equality of the partnership. Both Webster (2002) and Cohen (2002) noted that scientists, in particular, in such partnerships commonly expressed enjoyment of the experience but said it had little impact on their work as a whole.

At the original exploratory meeting, out of which the *Mountains to the Sea* project emerged, one of the artists questioned how we would keep the collaboration balanced so that the art would not simply be in 'service' of the science as had been the case in examples of largely technological and artistic unions that he had been involved with. Clearly, the notion of balance of power and contribution in collaboration, particularly with partners from such seemingly divergent standpoints, would be an issue to address. Equality of experience and benefit in any collaboration is likely to influence the long-term future of such partnerships, and much of the facilitation that supported the *Mountains to the Sea* project was directed towards this.

B Effect of task definition in collaboration

A second approach to understanding collaboration looks at the way in which the task environment affects a collaborative project. Atherton (2003) outlines the difference in function between what he has labelled 'formal' groups and 'informal' groups. Formal groups are organised by task, as occurs in most formal groups or organisations. The primary focus is on **tasks** that must be completed, and which need an organised system made up of specific **roles** for which **individuals** are recruited. In informal groups, Atherton suggests, the individuals provide the starting point. If they agree to work together, they will either assign, or take on, roles that make a system possible and which may lead to the completion of a task. In informal or self-organising groups, the task emerges from work of the group rather than the group emerging from the task.

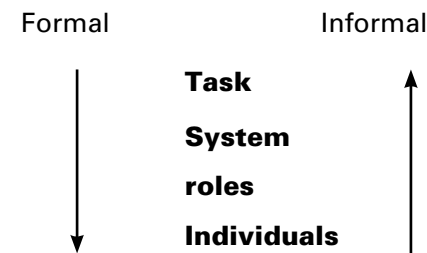


Fig. 1 Direction 'travel' within formal and informal groups (Atherton 2003).

The informal approach is distinctly different from the formal one, and for those who work in organisations and are used to the first concept, the second approach can be very challenging. We note that in our experience building collaboration around a task is difficult enough. To work towards deciding on a task is potentially much more difficult and requires more from the individuals involved. Such an approach also means that more attention must be paid to the goals of the individuals who are participating in the group, since it is these individual goals that actually hold the group together, rather than the task or some formal structure.

The *Mountains to the Sea* team clearly started with no clear, concrete goal and moderating the pull toward planning and creating 'the work' as opposed to exploring the direction a free ranging dialogue might take was a difficult facilitation task. As one participant said: *We always had this 'thing' we were focusing on creating. I'm not sure that the collaboration was 'the thing'.* For some in the team, the exploration process was of greater importance than the task, particularly in the early stages of project. However, for people who are used to working alone or in formal institutions, such an apparently directionless or even nebulous approach can seem unproductive. How does one 'tick off' participation in an ongoing dialogue, and how does one measure the benefits? How can we measure when a dialogue is good or when it is just good fun? Should the two be mutually exclusive?

This lack of a defined task set up a tension between those in the team interested primarily in what they might learn when working with others from different disciplinary backgrounds and those in the team who were most interested in developing a concrete 'output'. This was not a hidden tension though and there was considerable discussion about this throughout the process.

C Stages of development in collaborative processes

A third framework that we will be using to understand this collaboration highlights the developmental stages of the collaboration process. The *Mountains to the Sea* project had a number of phases. ISKM (integrated system for knowledge management) is a model that hypothesises four main phases in a collaborative learning process (main report, Table 1). These phases are termed *entry and contracting*, *information sharing*, *project planning, implementation* and *review*. Each phase has tasks that must be completed if the project is to be successful. However, no process is simply linear and, as Table 1 shows, the different ISKM stages do not always map onto specific events. For example, *entry and contracting* work took place every time a new team member was brought into the project and, to a certain extent, each time we set out on a new phase of the project. How well *entry and contracting* processes were managed had a significant effect on the outcomes that followed. The same can be said of each of these phases.

Appendix 3 Evaluation questions for the *Mountains to the Sea* project team

- 1 What has been the process of collaboration from your point of view as an individual, i.e. what stages have you identified in your process, in the process of others and in the group as a whole?
- 2 What have you enjoyed most?
- 3 What have you enjoyed least?
- 4 What did you (do you) expect out of this collaboration?
- 5 What benefits have there been for you in this collaboration? [Professionally and Personally].
- 6 What difficulties have you found in this project?
- 7 What aspects of our collaboration have been most successful in your view?
- 8 What aspects of our collaboration have been least successful in your view?
- 9 What has surprised you and why? (I.e. why was it different to what you expected?).
- 10 Is there anything that you can pinpoint as an 'aha!' moment that you credit as coming from this collaborative process?
- 11 What, if anything, would you say has changed about your understanding of the world or your art or your science (the process of doing it or the questions that you have) as a result of this process?
- 12 Are there questions that you came into this process with that you have some answers or thoughts about now?
- 13 If you could identify key 'instructions' to those following this kind of path what would they include?
- 14 What do you feel/think/imagine are important issues for this collaboration to address in order to be successful?
- 15 This project has included three 'large' aspects to grapple with.
 - A collaboration between artists and scientists that crosses disciplinary and geographic boundaries
 - The subject of 'Integration'
 - Involvement of a new 'wider' community.
 What difficulties/challenges do you feel each has presented? What progress has been made on these? What do we need to address to work further on these?



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