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*Main Article:*

# Strategic Integration: The Practical Politics of Integrated Research in Context

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## Abstract

Designing an integrative research program requires that research leaders negotiate a balance between the scientific interest of research and the practical interests of non-scientific partners. This paper examines the ways integrated research is formally categorised, and analyses the tangible expressions of the practical politics involved in reconciling scientific and practical interests. Drawing on a comparative study of two Australian Cooperative Research Centres, I argue that categories used by the research leaders to describe the research programs embody three different strategies for structuring the relationships between researchers and their partners. These include matching research program categories to partners' implementation program categories, reproducing existing integrative partnership models, and filling gaps in understanding with new technical approaches. These strategies offer different advantages and disadvantages. The cases suggest that the integrative approach favoured by each Centre depended on issues such as the geographic scope of policy arenas, sources of scientific credibility, and the political risks facing partners. The practical politics of research organisation offers a new lens for understanding both the practice and theory of integrated research.

**Keywords:** integrated research; practical politics; categories; research programs; cooperative research

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## 1. Introduction

The concept of integration as a distinct approach to research has emerged and risen to some prominence over the past decade. While some versions of *integrated research* refer to the integration of disciplines, this study takes integration to be primarily concerned with integrating research and application. This involves negotiation between various parties--both scientists and practitioners--to ensure that the research is scientifically robust and practically relevant. The design of research at the organisation and program levels is a significant site for this negotiation, yet the way this negotiation plays out is an aspect of research practice that is not commonly visible to those outside the process. Consequently little is known about the strategies that research leaders (researchers charged with managing a research organisation or program) use to meet these multiple goals.

This paper focuses on the ways integrated research is organised--particularly, how it is categorised into programs--and what this can tell us about the strategies research leaders use to balance the range of interests involved. The classification of research into programs is such a ubiquitous part of research life that it is rarely examined in detail. In most academic settings research programs replicate well-established disciplinary categories. However, integrated research organisations do not have these established precedents to follow. The presence of partnerships across disciplines and beyond academia implies that "standard" academic classifications of research are not necessarily the most useful. The juxtaposition of scientific and non-scientific partners in integrated research forms a milieu of professional and political interests, skills, incentives, motivations, and constraints that research leaders must somehow navigate. Research programs are one of the tools they use to create order and clarity in that chaos.

In this paper I draw on a comparative study of two integrated research organisations, both Australian Cooperative Research Centres, that examined how integration is negotiated and operationalised in research practice. I focus on the *practical politics* of designing a research program that accommodates the demands and socio-political contexts of both the researchers

and their non-research partners. (Throughout this paper I shall refer to the integrated research participants who are not researchers as "partners.") What strategies did the research leaders use in creating their research classifications? Are there identifiable factors in the interplay of the various partners and their socio-political contexts that may contribute to both the theoretical understandings of integrated research and its implementation in practice?

In the first part of this paper, I briefly describe the state of knowledge about integration in the academic literature. Following that, I elaborate on the concept of classification as a tangible outcome of the practical politics involved in negotiating different interests, and present the methods used in the study. I then describe the two cases, with an overview of the key players and the socio-political history that brought the different groups together in an integrated research organisation. Finally, I compare their research program categories and discuss the strategies embedded in them, with respect to the practical politics of needing to reconcile various interests and histories.

## 2. Integration in Theory and Practice

The proposition that the boundaries between science and society are blurring, with new modes of research emerging that are deliberately positioned at the interface between science and society, is now well established. These new research modes have been given many different labels. "Mode 2" (Gibbons, Limgoes, Nowotny, Schwartzman, Scott, & Trow, 1994), "post-academic science" (Ziman, 2000), the "triple helix" of science, industry, and government (Etzkowicz & Lleydesdorff, 2000), "strategic science" (Rip, 1997), and "post-normal" science (Funtowicz & Ravetz, 1993) are examples. Each of these theories or frameworks suggests that there is a widespread shift away from science that is independent from society to science that is deliberately embedded in public- and private-sector activity. Nowotny, Scott, and Gibbons (2001) make the argument quite specifically: the active segregation of science from its social context is giving way to a program of active science-society integration. This argument is not universally accepted (e.g., Weingart, 1997 ), but at a general level there is widespread agreement that integrated research is a significant, and growing, part of the contemporary research landscape.

Having said that, beyond this general level there is very little consensus on what is driving the push towards integration, or its effects on research practice. A review by van Kerkhoff (2005) identified 12 different applications of the term integration in seven research funding

and environmental management policy statements. This review showed that there are a number of different understandings of the problems that integration is believed to overcome. I go on to argue that lack of coordination across these different understandings inhibits efforts to learn about how integration works in practical terms.

Despite the considerable literature debating the nature and causes of integrated research, to date there has been very little work examining how it is actually done, especially outside the private sector. Private-sector studies have tended to use risk management as a framework for understanding integrated research practice (e.g., Couchman & Fulop, 2004; Das & Teng, 2001). While this makes sense in the context of private sector investment, it is unclear whether risk plays such a central role in a non-profit context. Indeed, even the basic concepts of integrated research are not well understood in this setting. In one of the few pieces of micro-level empirical work on relationships between researchers and "users" in public management, Davenport, Leitch, & Rip (2003, p. 240) have noted that "usage of the concepts of 'user' and 'relevance'... appears to be widely accepted with little analysis of how such concepts play out in practice." They show that users are often regarded as members of groups that do not actually exist, and claims of "representation" are thus problematic. Although conducted under a different methodological framework, their study highlights the same issue that underlies this study: that integrated research is fraught with categories and labels that hide complex negotiations and difficult politics. While keeping the negotiations and politics hidden from view is no doubt often expedient to the people directly involved, it comes at the cost of preventing other practitioners from learning how to approach and deal with the complexities of integrated research.

## 3. Research Methodology

The material presented in this paper is drawn from a larger study that sought to answer the overarching question: what is integrated environmental research? To do this I investigated how people involved in developing new environmental research organisations with a mandate to *do* integration understood and implemented the concept. The focus of the study was to examine the ways emerging ideas of integrated research were articulated and negotiated between research and non-research partners, and how these influenced, and were influenced by, the practicalities of designing a functional integrative research organisation.

The social practice of categorisation was used as an observable site of these negotiations. The notion of categorisation as a social practice is concerned with how categories are developed, negotiated, and used to structure relationships and action. Bowker and Star (1999) have argued that categories order human interaction--we assign things into categories so that we can better determine what to *do* in relation to those things and each other. This applies both to formal typologies and informal, ad hoc categorisations. In this paper I focus on what Bowker and Star refer to as the "practical politics" of classifying research into programs. Practical politics are the negotiations involved in deciding which aspects of the social practice of categorisation are to be highlighted or emphasised, and which others are allowed to remain in the background. This can be a matter of bringing to the fore the most important or relevant dimensions of the practice, but it may equally be a matter of deflecting attention from controversial or undesirable features. As such the analysis of the practical politics of categorisation of integrated research into programs is concerned both with what is visible in the category labels, and what is invisible. What work does this visibility/invisibility do in ordering the relationships among partners? It is in this way that the classification of research programs can be regarded as a window onto the negotiations of science and politics that together define how integrated research unfolds in practice.

A caveat is in order here about the generalisability of outcomes from this case comparison. I do not argue that all integrated research participants will encounter the same issues as those I identify. However, the lack of empirical work on integrated research noted earlier indicates that the findings presented here may offer more relevant insights to the practice of integrated research than the macro-level theories have offered to date. In addition, by comparing across organisations that were funded under the same program, with the same rules and administration, the differences between them can be reasonably attributed to the composition and characteristics of the organisations, rather than different organisational structures or overarching mandates. Finally, apart from the findings themselves, this paper offers integrated research participants a structured way of thinking about the activities of organising research. The approach and methods used here illustrate that the decisions of categorisation, often regarded as peripheral to the 'real work' of science, are important sites of negotiation of what integrated research is, and how it is to be done.

The cases were selected as exemplars of integrated research practice (discussed in more detail below). The study began in mid-2000, and continued until early 2002. The entire study consisted of 42 semi-structured in-depth interviews, observation at four conferences,

and document analysis. The interviews were conducted in two rounds. Participants were selected to maximise diversity across five factors: their role in the Cooperative Research Centre, research program affiliation, home institution, location, and gender. The *first round* of 28 interviews included interviews with 16 researchers in various roles (project managers, researchers, and theme/program leaders), the Chief Executive Officer of each Cooperative Research Centre, three Board members, four stakeholder representatives, two graduate students, and two communications managers (one person played dual roles). The *second round* of 12 interviews was used to check and clarify the issues and ideas that emerged from the first round of interviews. The aims of the interviews were to learn about the social, historical, and other contextual factors that had led the participants to join the Cooperative Research Centre, how they understood the integration mandate, and their experience of how it was playing out in practice.

A range of documents was also examined. These included official Cooperative Research Centre publications, such as annual reports, strategy statements and scientific reports, as well as contracts, public newsletters, and media releases. These presented "official" expressions of the Centres' structures, roles, and activities that were compared with the "unofficial" perspectives of the interview participants.

These data sources were coded using open coding techniques, then analysed thematically. This paper draws on the themes that focused on the relationships between the researchers and the non-scientific partners. These themes were compared across formal presentations of the research programs, observations of how these groupings shaped interactions among the participants, and participants' accounts of their interactions with colleagues within and across the formal divisions.

## 4. The Cases: Cooperative Research Centres

Cooperative Research Centres are natural science and engineering research organisations formed by formal agreements between extant organisations ("core partners") and the Australian Federal Government. The Centres bring together researchers (from different universities, government agencies and the private sector) and research users (such as government, industry, and community). They have a small central administration, but most participants remain employed by the "core partner," or parent organisations rather than the Cooperative Research Centre, and so remain dispersed across different organisations and

locations. The Centres are funded through competitive bids for government funding, with at least matching cash and in-kind contributions from the partner organisations. The Cooperative Research Centre Program began in 1990, and there are about 60 Centres in operation at any given time (see, for example, CRC Program 2002). The program has been widely regarded as a highly successful example of a university-government-industry hybrid, and now accounts for 22% (AUD 1.82 billion) of the Australian Federal Government's total research budget for 2001-2011 (Department of Education, Science and Training, 2004).

Table 1: *Core Partners in the Cooperative Research Centres*

| Type of organisation | Coastal CRC | Greenhouse Accounting CRC |
|---|---|---|
| University | University of Queensland<br>Central Queensland University<br>Griffith University<br>James Cook University | Australian National University<br>Western Australia Chemistry Centre<br>University of Melbourne |
| Australian Federal Government Research Agency | CSIRO<br>Geoscience Australia | CSIRO<br>Bureau of Rural Sciences |
| Other Australian Federal Government | | Australian Greenhouse Office |
| State government | Queensland Department of Natural Resources and Mines<br>Queensland Department of Primary Industries<br>Queensland Environment Protection Agency | Queensland Department of Natural Resources and Mines<br>Queensland Department of Primary Industries<br>Western Australia Department of Conservation and Land Management<br>New South Wales State Forests |
| Local government | Brisbane City Council | |

This study looked closely at the early life of two Cooperative Research Centres: Cooperative Research Centre for Coastal Zone, Estuary and Waterway Management (the Coastal CRC), and Cooperative Research Centre for Greenhouse Accounting (the Greenhouse Accounting CRC). These particular Centres were selected for their similarities. Both operate in the environment sector. They are unincorporated joint ventures between 10 core partners with various other supporting partner organisations. The core partners are listed in Table 1. They are similar in budget size, with the total estimates for the Coastal CRC and the Greenhouse Accounting CRC approximately AUD 68 million and AUD 69 million respectively (CRC for Coastal Zone, Estuary and Waterway Management, 2001; CRC for Greenhouse Accounting, 2001). They are also roughly similar in research capacity: in 2001 the Coastal

CRC had about 50 full-time equivalent research staff and the Greenhouse Accounting CRC had 57 (CRC Program, 2002), although in practice this extended to well over a hundred researchers for each Centre, as almost all researchers had only part of their time committed to Cooperative Research Centre work. They were selected in the same round of applications (the 1998 funding round), and were formed under the same set of contracts. Both Centres were funded for seven years and will cease operations in 2006.

### 4.1. Integration in Cooperative Research Centres

The application guidelines the Centres used to construct their successful proposals highlighted the importance of integration. The guidelines specified that the Cooperative Research Centre should result in "substantial integration of research activity that goes beyond the existing research efforts of the individual participants" (CRC Program, 1999, p. 6), and that participants should:

> form collaborative relationships within an integrated research program. Participants should not divide the research program into discrete projects that are carried out solely by individual participants, pursuing their own separate objectives. (CRC Program, 1999, p. 8)

These two conditions indicate that integration is a matter of coordination between projects, in the sense of aiming to meet an overarching research objective. Following the success of a bid, integration is reiterated through review processes. The Centres undergo a formal review in their second year. In this review they are assessed on:

> The degree to which the CRC has built links between the participating research groups and organisations, and integrated and enhanced their activities in research and education; [and]
>
> The degree to which key user groups, including industry, have been integrated into the CRC as core participants, and have made substantial commitments of resources. (CRC Program, 2001, p. 14)

This document specifies that integration involves both the scientific activities of research and training, as well as integration beyond academia, including "key user groups." These quotations show that integration was considered to be an important feature of Cooperative Research Centres, with general level guidance as to what (or who) should be integrated, but considerable room for interpretation as to how this integration should be achieved in research practice.

### 4.2. The Integration Context in the Coastal CRC

Coastal management in Australia is a highly fragmented issue politically and managerially. The number of government agencies with responsibility for coastal management is high and crosses local, state and national jurisdictions. Local government councils are responsible for water supply and sewerage as well as coastal development. State government agencies, including environment protection authorities and natural resource management agencies have a wide range of legislative responsibilities in the coastal zone, as do Federal Government departments and statutory authorities.

This complex situation was coupled with increasing government and popular pressure on industry to reduce their impact on coastal environments, and increasing community awareness and activity in water quality management. In other words, the number of stakeholders was high and their backgrounds and interests were diverse. Consequently stakeholder demands of science--what they believed research could usefully contribute to their decisions and activities--were highly varied. So for the Coastal CRC to effectively engage with relevant stakeholders, researchers needed to be flexible depending on what they were researching and who they were working with.

The Coastal CRC is based in the city of Brisbane, Queensland. When the Cooperative Research Centre proposal was being developed, there was already a significant science-government-community partnership in operation in that region. This program, the South-East Queensland Regional Water Quality Research and Management Strategy (referred to here as the South-East Queensland Strategy) had formed a partnership between 17 local government councils, academics, and local community groups. It was a research and outreach program that aimed to increase knowledge about the health of the local coastal waterways, inform local government management activities, foster community participation in monitoring, and promote waterway health through education and community engagement. The centrepiece of the South-East Queensland Strategy was an annual “report card” for the local waterways, a scientific assessment of the health of the different rivers and coastal areas. This report card was designed to present the scientific research in a publicly accessible way, and was widely promoted and distributed throughout the region.

The presence of the South-East Queensland Strategy meant that there was an existing “bridging” structure and a connected cohort of people that the Coastal CRC could tap into. Some of the researchers involved in the Strategy were also key participants in the Coastal

CRC. Other participants from different regions did not have this formal connection, although they often did have good one-on-one or small group working relationships between researchers and practitioners or community groups.

### 4.3. Organising for Integration in the Coastal CRC

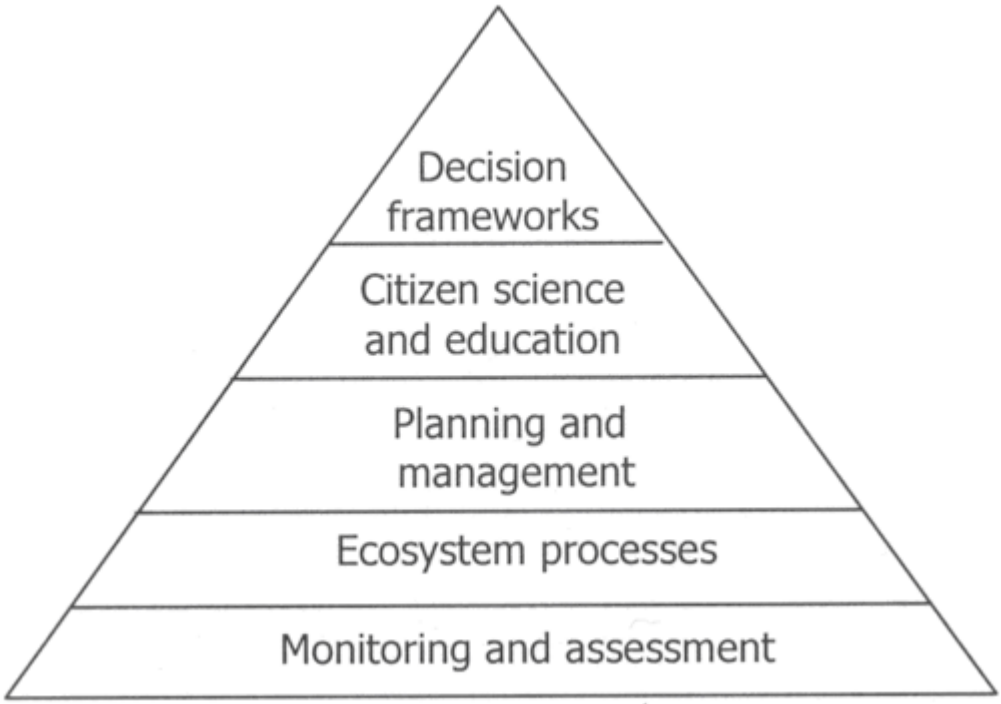


*Figure 1.* The Coastal CRC's Thematic Research Program Structure (CRC for Coastal Zone, Estuary and Waterway Management, 2000).

In this representation of the research structure, the theme at the base of the triangle is the least complex in terms of information. The information from Monitoring and Assessment contributes to the more complex theme of Ecosystem Processes, and so on, until the final theme, Decision Frameworks, incorporates information from all of them. Figure 1 was used extensively by the Centre to promote its research approach. It appeared, for example, on the back of every business card. Each theme was interdisciplinary: monitoring and assessment, for example, drew on a range of biological, ecological , and chemical sub-disciplines, as well as hydrologists and engineers, depending on the actual task at hand.

The thematic structure of Figure 1 was complemented by a second research structure: Management Study Areas. These were physical locations where the Centre's research was concentrated. The four Management Study Areas were: South-East Queensland, drawing on the existing South-East Queensland Strategy group; Fitzroy, a rural area in Central Queensland; Gladstone, an industrial port, also in Central Queensland; and National, for covering nationwide projects. The overlay of physical locations over themed groupings was described by one participant as a matrix arrangement, where research activities took place simultaneously in two dimensions, as represented in Table 2.

Table 2. *A Matrix of Themes and Management Study Areas*

| | **Management Study Area** | | | |
|---|---|---|---|---|
| **Theme** | SE Queensland | Fitzroy | Gladstone | National |
| Decision frameworks | | ↓ | | |
| Citizen science | | ↓ | | |
| Planning and management | → | ***Project x*** | | |
| Ecosystem processes | | | | |
| Monitoring and assessment | | | | |

Focusing their research in these areas was intended to achieve two things: first, increased cross-fertilisation of ideas and research results within the scientific program; and second, increased local relevance of the Centre's research to relatively clearly defined groups of stakeholders. The trade-off was essentially between the geographic relevance of the Centre's research (limited to one jurisdiction, with the exception of a small number of nationwide projects) and the ability to integrate research both in interdisciplinary terms and in terms of its relevance and usefulness to stakeholders.

The existing South-East Queensland Strategy was potentially a model for the other management areas, indeed some saw the main rationale of the Coastal CRC as trying to replicate that model in the other Management Study Areas. The South-East Queensland Strategy provided an example of how science, government, industry, and community could work together effectively, a way of structuring how a Cooperative Research Centre might operate and what they might do in other areas. However, achieving the same level of

organisation in the other two regions proved difficult, as there was either a real lack of connectivity between the key players, or existing relationships that may have been jeopardised by trying to implement a new cooperative regime. Over the course of this study there was little indication that the South-East Queensland Strategy would be replicated in the other areas, although new partnerships were developing.

### 4.4. The Integration Context in the Greenhouse Accounting CRC

At the time of the Greenhouse Accounting CRC's formation (mid-1999), several major political forces were underway in both the national and international political arenas. At the international level, the Kyoto Protocol negotiations were in full swing. This was a highly contentious issue in Australia, as the Federal Government's position at the Kyoto negotiations argued strongly that sinks should be included in calculations of its carbon emissions. This reflected the belief that Australia, with a large capacity for plantation afforestation, would benefit from the inclusion of carbon sinks if large-scale forest regrowth counted as carbon credits. This would reduce the impact of emission targets on other economic sectors and place Australia in a strong position in terms of international carbon trading. This position was being criticised both within Australia and by the international community, on the grounds that it countered incentives to reduce emissions from other sectors. As such there was considerable uncertainty about both international and Australian greenhouse policy.

Australia's greenhouse policy was coordinated by a single national agency, the Australian Greenhouse Office. The federal government created this agency in 1999 to act as a central point for all national greenhouse-related issues. The Office spanned several existing government departments and agencies that were responsible for different aspects of climate change. Its activities included an operational program on greenhouse accounting, primarily through two projects, the National Greenhouse Gas Inventory (measuring Australia's carbon stocks) and the National Carbon Accounting System (a methodology for accounting for changes in those stocks).

To maintain relevance to a user community within this very changeable atmosphere, the Centre effectively "tied" its activities to these specific government projects. Several partners had been involved in these projects prior to the formation of the Centre, including university researchers, state agency researchers, and researchers from the Commonwealth Scientific and Industrial Research Organisation (CSIRO), Australia's national scientific and industrial

research agency. The Greenhouse Accounting CRC emerged largely in response to what was seen as an ongoing need for research to further develop and refine these tools, regardless of the eventual outcomes of international and national negotiations. The Australian Greenhouse Office also saw the potential value in the partnership, directing 10% of its research budget as a cash contribution to the Centre. This high-level, concentrated focus of both scientific and stakeholder interests was a stark contrast to the local, dispersed groups with an interest in coastal management. In part this was made possible by the Australian Greenhouse Office having already linked the relevant government actors.

### 4.5. Organising for Integration in the Greenhouse Accounting CRC

The research structure of the Greenhouse Accounting CRC was based on four research programs, with a fifth supporting program, Education and Outreach, managing postgraduate students, other educational activities, and public communications. (The research structure has changed twice since this study was completed, the original structure is the one discussed here.) The four research programs were Sequestration Processes, Biomass Carbon, Soil Carbon, and Integrated Assessment. The range of disciplines involved was considerable, including fundamental research into plant physiology, soil chemistry, ecology, and computer modelling.

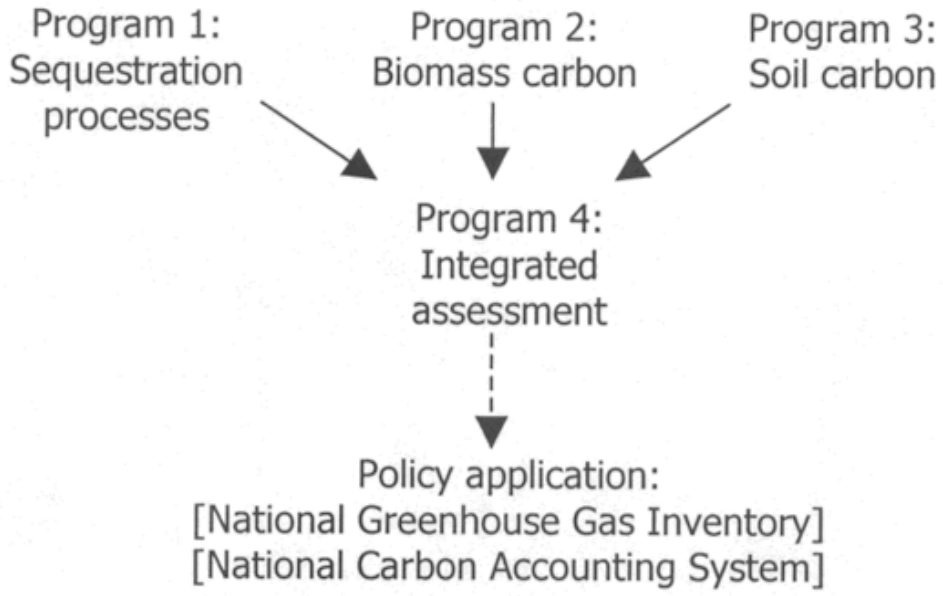


*Figure 2.* Research Flows in the Greenhouse Accounting CRC.

The first three programs were designed to feed information into the fourth program, Integrated Assessment, a program primarily concerned with quantitative modelling. This structure is illustrated in Figure 2.

Three of the four programs (Biomass Carbon, Soil Carbon and Integrated Assessment) emulated three of the six programs of the Australian Greenhouse Office's National Carbon Accounting System (Biomass, Soil Carbon, and Modelling). The exception, Sequestration Processes, was described as the Centre's "basic science" program. Figure 2 illustrates that the scientific integration was the work of the single program (Program 4 Integrated Assessment), rather than the *progressive* integration envisioned in the Coastal CRC's hierarchical model. Two of the four projects in Program 4 were designed specifically to "assist the future development of the National Greenhouse Gas Inventory" (CRC for Greenhouse Accounting, 2000, pp. 24-25), while the other two sought to provide "timely assessments" to policy-makers. This was in contrast to the other programs that were largely concerned with more traditional scientific goals such as "improving understanding." These confirm the Centre's rather conventional stance of providing expert advice and products, produced in relative independence, leaving the work of integrating the science with their partners' needs to a single program. This work was the substance of the formal modelling and policy advice projects in Program 4. The Integrative Assessment team were attempting to build a computer-based modelling "shell" that other research programs could feed their results or other models into. The policy advice projects sought to synthesise the Centre's research into informative briefings for policy-makers.

## 5. Research Program Strategies: Matching, Reproducing, and Gap-Filling

The three different research program structures noted in section 4, namely the thematic hierarchy and the Management Study Areas of the Coastal CRC, and the integrative modelling of the Greenhouse Accounting CRC, suggest three different strategies for ordering the chaotic milieu of relationships that made up the new Centres.

The first strategy, the Coastal CRC's primary research classification scheme, the information complexity hierarchy, aimed to create a point of reference that both researchers and partners could use to identify and fill gaps between science and management. Two themes, Monitoring and Assessment, and Planning and Management placed the research within a suite of management activities. These labels served as readily identifiable "mutual

territory" between the researchers and non-researchers. The other three labels, Ecosystem Processes, Citizen Science, and Decision Frameworks, were more abstract, in that they did not reflect terms in common usage. They were formulated as scientific gaps (in the sense of "we don't know enough about X"), but they were gaps that the research leaders considered to offer real potential to managers. Managers were not necessarily convinced though. For example, after a public demonstration of a computer-based decision support tool developed by researchers in the Decision Frameworks program, one local manager commented that you can go through the rather lengthy and technical process embodied in that system and "still end up with an answer that's rubbish."

Second, the Coastal CRC's Management Study Areas structure attempted to reproduce an existing integrative program (that of the South-East Queensland Strategy) in other geographic areas. However, the biophysical, socio-political and industrial differences between the geographic areas meant that the South-East Queensland Strategy could not be simply transferred to the other areas. At a general level the Management Study Area structure worked well in terms of creating a (literal) common ground between researchers and partners. Both groups readily identified their work according to these programs, and while researchers had a greater tendency to speak of their work with reference to the thematic program structure, this did not negate Management Study Area affiliations. The main disadvantage of the reproduction strategy embodied in the Management Study Area structure was the assumption that existing relationships in different areas could *and should* be reshaped by imposing the South-East Queensland Strategy model on them. The Coastal CRC was responsive to these concerns, and the initial vision of reproducing that model in the other Management Study Areas dissipated quite quickly.

In the third strategy, the Greenhouse Accounting CRC matched its research program to the categories already established by its major stakeholder (and financial contributor, outside the CRC Program), replicating them almost verbatim. This was similar to the matching strategy used by the Coastal CRC in that it took advantage of an existing model, but involved matching the content, rather than reproducing a structure. This cemented the relationship between researchers and practitioners, implying that the research would "fit" established priority action areas. It was a readily identifiable link that could be invoked by the researchers as evidence of relevance of the research. Similarly, the Australian Greenhouse Office could also justify its investment by pointing to the research program categories as an expression of shared interest and benefit. However the matching classification strategy also

generated resistance among the researchers who perceived that they were being "bought out" by the major stakeholder, and confusion about the extent to which they were meant to be developing an independent research program or servicing an existing one. It also brought to the fore the uncomfortable situation of the more minor partners, who were also researchers (the state agency research divisions, but also other non-university research agencies such as CSIRO). As researchers, they were operating in a relationship with other investigators that was structured according to "objective" technical criteria; as stakeholder representatives they were operating in a relationship dominated by the interests of a different stakeholder whose strategic and operational needs were different from theirs. The main partner also regarded the relationship as problematic. An independent evaluation of the National Carbon Accounting System noted that the relationship with the Centre "has not been easy," with concerns "that this arrangement has not provided the expected benefits" (Pat Farelly and Associates, 2002, p. 20).

The three program structures offered three different strategies for connecting research and application. Each strategy offered advantages and disadvantages, and while none of them was an unqualified success (in the sense that the original vision of the strategy was fulfilled), either the visions or the categories were adapted as researchers and partners learned more about each other. In this way the research categories were indeed *sites of negotiation*. But what was it about the practical politics of integration that led research leaders to choose these strategies in the first place? In the next section I will briefly outline three key differences in the socio-political contexts of the two Centres that may help to explain the different integrative strategies.

## 6. Practical Politics

As noted earlier, practical politics is the work categories do, in making some aspects of an activity (or relationship) visible, leaving others in the shadows. In this section I examine how the categorisation strategies highlighted either the interests of the researchers or the partners.

### 6.1. Geographic Scope of Policy Arenas

It was noted earlier that coastal management crosses jurisdictions, but is mostly a local issue. In contrast, greenhouse accounting is an issue primarily of concern to the national and international sectors. The kind of output that is valued scientifically is typically results

which are generalisable across geographic locations. Consequently, the Greenhouse Accounting CRC's decision to match the National Carbon Accounting System's research categories did not involve a significant compromise with the scientific value of the work. Categories such as *Biomass Carbon* were general enough to allow many researchers to proceed with their existing, ongoing research agendas. In the Coastal CRC's case, the relationships between the application value of the research and its scientific value were less obvious, and not as complementary. To maintain relevance at the local level, both research program structures emphasised application rather than science. The appropriate balance between the two was negotiated more "privately" at the project level, rather than determined at the program level.

### 6.2. Scientific Credibility

Another aspect of the practical politics the Cooperative Research Centres needed to manage was the political situations faced by their partners. The controversy surrounding Australia's position on forests under the Kyoto Protocol meant that any research that added to that controversy--that might fuel the public criticism--would potentially undermine their relationship with the Australian Greenhouse Office. Some researchers were keenly aware that matching their research to the Federal Government's existing action agenda meant matching it to a political agenda as well. Although the matching strategy tied the Centre closely to the Australian Greenhouse Office's *scientific* agenda, rather than a policy agenda, many researchers felt this was an inappropriate balance between scientific and partner interests.

In the Coastal CRC, the partners' political risks centred more on wasting scarce resources and failing to achieve publicly stated environmental goals than on public controversy. The science of coastal management was not as politicised as greenhouse research was, but the political risks of supporting irrelevant research or failing to improve management were still very real to the partners. The gap-filling and reproduction strategies both highlighted the Centre's commitment to their partners' needs, and downplayed the scientific research agenda. There is no evidence to suggest that the Coastal CRC's research was any less rigorous as a result, but their public persona emphasised their work to achieve applicability more than their work to achieve academic standards of rigour. This meant that the appropriate balance was typically negotiated directly between researchers and partners at the project level, and the projects varied quite markedly in the extent to which they genuinely engaged local stakeholders.

The effect of differences in sources of scientific credibility and partners' political risks on strategic choices corresponds with Couchman and Fulop's (2004) findings that risk is integral to understanding cooperative research. However, in public settings (rather than the private case they focused on), using the notion of risk as the basis for analysing integrated research offers only partial understanding of the practical politics that are involved. The importance of the scale of management suggests the more fundamental question of how people make sense of research in relation to their contexts also needs to be addressed.

## 7. Conclusion

This study aims to draw the attention of researchers, particularly those in leadership roles, to the significance of research program categories. These categories do more than structure the research groups or put a public face on cooperative activity--they are sites where the crucial balance between scientific and non-scientific interests is negotiated. As the cases showed, the key issue is not so much getting the categories "right" but understanding the role categories play in balancing the stakeholders' interests. As those interests change, or become better articulated, even the best program categories may change. The question of whether the projects contained within the programs actually achieve this balancing act is clearly important, and cannot be answered by this analysis. But it is all too easy to claim that the actual research work was "successful" or "unsuccessful" without actually investigating what would constitute success in terms of the *partnership* between researchers and non-researchers, rather than from the perspective of one group or the other.

In terms of the theory of integrated research the study shows that activities that are not usually regarded as significant foci of analysis, including the naming of research programs, take on heightened importance in an integrated research context. The concept of practical politics, and the light it throws on the often-overlooked practice of organising research, offers a useful lens for everyone interested in, and involved in, integrated research practice.

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