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ARTICLE

Leveraging opportunities for campus sustainability: a case study of water resources

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Institutions of higher education are well situated globally for transformation toward sustainability. The case of the Water Resources Planning Committee (WRPC) at Appalachian State University in North Carolina, United States offers insight into how educational institutions might identify and leverage transformative opportunities. The article suggests that a "window of opportunity" can open when diverse actor-groups share a common interest or goal and when individuals are able to "bridge" the groups as a way to create synergy. Once together, these groups can collaborate by sharing knowledge and resources. They do not avoid conflict, but rather constructively use organizational tensions and cultivate flexibility to further common goals. This case study focuses on interrelationships among a public university's teaching and research missions and its place within a broader community as it transforms toward sustainably managing campus-water resources.

KEYWORDS: educational institutions, sustainability, water resources, organizational behavior, watershed management, local planning, cooperation

Introduction

A growing body of literature on creating a sustainable university focuses on the role of higher education in its broader social context (Sharp, 2002; Cortese, 2003; Calhoun & Cortese, 2005). Integral to these discussions is the need for universities to transform physically, cognitively, and philosophically. Lozano (2006) identifies numerous organizational barriers to implementing sustainable development principles, including internal power struggles and the radical nature of sustainable development relative to traditional management approaches. In an editorial for a special issue of the *International Journal of Sustainability in Higher Education*, Adomssent et al. (2007) state, "sustainable development, and the process of institutional transformation this requires, remains a considerable challenge for universities." Sharp's (2009) recent contribution to this journal on the state of the campus sustainability movement indicates the depth and breadth of this challenge.

While the notion of transformation is inherent in the sustainability literature, what, exactly, institutional transformation implies, and how it might be achieved, has not been adequately specified. Sharp (2009) begins to address this gap by discussing, for example, the role of a "change management function" as part of a long-term institutional strategy. However, little attention has been paid to date to identify the conditions that catalyze the *initiation* of change toward institutional transformation. This article identifies the significant characteristics, embedded in a case study, that demonstrate a "window-of-opportunity" approach for leveraging situations ripe with transformative capacities. The case study focuses on interrelationships among a university's teaching and research missions, its role as an institution, and its place within a broader community. Our approach is consistent with Ehrenfeld's (2008) observation that the key to institutional transformation is focusing on routine processes to identify how and where to make adjustments. He writes that:

> This process of transforming what at first are nonroutine actions into the normal way of behaving is one of the primary objectives of [an] overall design strategy. When the actions become routine, the associated beliefs and norms become embodied. As more and more individuals [or institutions] follow the same new routine, the beliefs and norms will begin to enter the collective, social consciousness.

We argue that institutional transformation requires assimilating concepts and practices based in diverse philosophies and that it resists efforts that would limit either ideas or actions to a single discipline or frame. In preparing this article, the authors have used the theoretical frameworks of complex

systems, participatory planning, production of space, and adaptive management, among others as equally applicable to transformation in general and to our case study in particular. A narrower theoretical focus is also antithetical to one of our main findings: in seeking transformation, there is no linear, one-size-fits-all way forward. Our inductive approach offers a pragmatic understanding of institutional transformation in the context of one university's attempt to become more sustainable. We find that working toward such institutional transformation is not only interdisciplinary; it is also an opportunistic, multiscalar response to external and internal pressures for change. These pressures are expressed in multiple opportunities for action that cannot be prescribed, given the complex social-ecological systems that characterize sustainability and the "irrational life of the institution" that exists parallel with its organizational rationality (Sharp, 2009). Therefore, it is crucial to recognize unprecedented opportunities and to be prepared to leverage such opportunities into action that supports significant transformation.

Using the Water Resources Planning Committee (WRPC) at Appalachian State University (ASU) in North Carolina as a resource-specific case study, we describe how, amid uncertainty, windows of opportunity have opened that have allowed ASU to actively pursue sustainability. The WRPC focuses on water resources, but it potentially serves as a model for similar sustainability-directed efforts because it considers such issues from diverse standpoints. While all universities have interrelated environmental, economic, and social issues, the specifics of what is sustainable will differ in each instance. The transformative process will determine the particular shape of sustainability for any institution.

This article is divided into three sections: Background, Leveraging Windows of Opportunity, and Conclusion. The Background introduces the particular actors and highlights the sequence of events that contributed to the formation of WRPC. The next section theorizes the characteristics of the actors who leveraged the window of opportunity described in the prior section. We describe their interaction using four actor-group capacities that characterize transformative opportunity: synergy, collaboration, conflict, and flexibility. The final section discusses how these relationships are playing out with WRPC as a focal point for considering transformation toward campus sustainability.

Background to the Case Study

Case Study Setting

Established in 1899, ASU is situated in the Appalachian Mountains and serves about 16,000 students in 140 major programs. The campus is located in downtown Boone, both a prototypical "college town" with a full-time population of about 15,000 people and the urban service center of northwest North Carolina. The area is also a tourist destination, with forests and golf courses, rock cliffs and ski slopes, and the headwaters of four river basins. Despite their importance to unique ecosystems and to downstream human-population centers, these streams have not been well studied or protected from human impact. Agricultural practices have caused significant degradation to water quality and riparian zones. The steady growth of population and tourism also presents significant land and water-resource challenges, including development on steep slopes and in floodplains, as well as issues pertaining to water conservation and stormwater management. The university campus is located in the watershed of Boone Creek, a tributary to the New River. Stormwater from campus and the dense historic downtown drains into the creek which is culverted along ASU's main access road and daylit through a linear park at the campus entrance. Because water is crucial to all life, but does not respect political boundaries, it offers an excellent focal point for addressing complex adaptive social-ecological systems (Walker & Salt, 2006).

The Water Resources Planning Committee

In February 2007, WRPC–comprised of faculty from six academic departments, a professional engineer from the Office of Design and Construction, and members of three community organizations–was charged by the ASU provost with developing recommendations to manage Boone Creek on campus. In less than two years, WRPC evolved from a "green" campus initiative to a nascent prototype for institutional transformation. The Committee joins people from operational and academic units, involves community organizations and local governments in its work, has high-level administrative support for its recommendations, and is growing in resource allocation and influence despite conflict. The following narrative of WRPC's inception shows how individuals and events converged in unpredictable ways to "embrace emerging opportunities [and] constantly shifting priorities and resources" (Sharp, 2002), inadvertently creating a window of transformative opportunity for sustainability.

Several unrelated events and activities contributed to the window of opportunity that opened to enable WRPC to be established. Early in 2004, Jana Carp's planning studio course on the stabilization and enhancement of the downtown creek catalyzed an ad hoc citizen's committee called the Kraut Creek Committee (KCC) ("Kraut Creek" is the vernacular name for Boone Creek derived from a mid-20th cen-

tury sauerkraut factory that regularly released its effluent into the stream). Members represent academic, political, environmental, and economic development interests and advocate protecting and enhancing the stream to their separate constituencies. Later that year, hurricanes brought significant flooding to the region and then, in 2005, the municipal government released a study documenting the need to increase its water supply. In 2006, KCC began work on a grant-funded feasibility study—with formal endorsement from town and county governments, ASU, and various local and regional organizations—for improving 1.3 miles of the creek. The university and the local chamber of commerce eventually implemented an off-campus collaborative demonstration project.

Even before these initiatives, ASU science faculty had been conducting teaching laboratories in and along the creek for several years. However, in 2005, three newly arrived science faculty began to develop a cross-disciplinary program of creek-related research, outreach, and educational activities. In 2006, they instrumented the creek and began collecting data. Meanwhile, Kristan Cockerill (an environmental policy analyst) arrived at ASU and started to collaborate with the scientists on grant proposals to expand the creek-monitoring program. She also began to work with a regional nonprofit organization to develop a community water-education program. By late 2006, with almost a year's worth of data showing negative impacts on the creek from runoff-induced thermal pollution and salinity, the physicist on the monitoring team met with the provost to propose that the university proactively manage the creek. The result was WRPC, of which both authors are members.

Through 2007, WRPC focused on responding to the provost's charge to make recommendations regarding creek management. Members discussed creek-remediation concepts and reviewed the upstream-remediation efforts of KCC and the county cooperative extension office. The group decided to expand its scope from a single creek to the broader campus and its watershed. Recommendations in WRPC's report to the provost included adding low-impact development policies to design and construction guidelines, establishing a director of sustainability for campus operations, designating WRPC as the advisory committee to review design and construction plans for water-management impacts, and funding faculty activities. The provost accepted the recommendations without committing to specific implementation plans and offered unspecified financial support.

In developing the report, WRPC undertook a visioning exercise to establish common ground that produced two broad goals: 1) to rehabilitate the stream to be ecologically healthy; and 2) to provide for diverse use of the riparian corridor for scientific, educational, recreational, aesthetic, and property-management purposes. Individual time constraints, as well as different attitudes toward the relevance of "visioning," truncated the exercise and an attempt to generate more detailed objectives from the various disciplinary perspectives failed. However, the group did agree on the immediate need for a demonstration project to signal the general mission of applying available expertise to improve riparian conditions on campus. A biology professor designed an experiment to assess the effects of grass mowing on riparian invertebrate populations. A campus-project manager serving on WRPC facilitated the logistics of this experiment with the grounds crew. As expected, the results (invertebrate population increased when mowing ceased) showed how simple actions with low cost can have large positive impacts. Then, faculty from physics and chemistry, along with the campus-project manager, coordinated a second experiment to test whether permeable pavement could help with thermal regulation of stormwater runoff. Once funding, timing, and location issues were settled between WRPC and the Office of Design and Construction, the experiment was conducted and showed that this approach did not reduce thermal pollution.

In 2008, Cockerill became chair of WRPC. One of the year's two targets–obtaining more funding to help meet the stated goals–was achieved to a degree. The Committee secured a small external grant to develop a workshop about stream health for middle school teachers, linking ASU faculty, KCC members, and cooperative extension personnel with public school teachers. The provost also provided approximately US$50,000 for nonrecurring equipment costs in response to a request for more than US$200,000 for water-monitoring equipment, support for student researchers, and laboratory personnel. The Committee had asked for funding to conduct several years worth of research across multiple disciplines. The provost noted the fiscal reality that it is easier to buy "things" than to buy "people," and therefore all of the equipment requested was funded and none of the personnel.

The WRPC's second target for 2008–increase input on campus-development activities to advocate for stream health–was also met. The Committee's members reviewed plans for a new building and for a creek-rehabilitation project. Both projects received a generally positive appraisal, with some changes indicated. However, water-management measures included in the initial building plans were later removed due to budget limitations. At Cockerill's request, the provost convened a meeting of faculty, staff, and high-level administrators to discuss constraints and opportunities for the new building's wa-

ter-related features and how WRPC might be better used in campus water-resource decisions. Important project information was shared and the responsible administrator suggested that the committee appoint a representative to the planning committees for new buildings or other campus-development projects. While this gesture represented high-level administrative support for WRPC input, several members perceived service on these committees as additional uncompensated work, limiting the incentive to participate. Cockerill has attended several planning meetings, but this is an ongoing concern for the Committee.

The WRPC is the first faculty-led committee at ASU with diverse institutional and off-campus membership and an official advisory role in campus development. Comparing conditions "before" and "after" WRPC helps gauge its effectiveness. Before, campus-water resources were not considered comprehensively and faculty and community expertise was excluded in designing campus projects with significant water impacts. Now, the Committee's input is welcomed. Before WRPC, there was limited interaction among various disciplines and interests related to campus-water resources. Now, WRPC is a venue to discuss both disciplinary and collaborative approaches to teaching, research, and practical management of water on campus and in the surrounding community.

The Committee is not the formal "change management team" that Sharp (2009) discusses as central to organizing institutional transformation toward sustainability. However, in the short time it has existed, and despite its small size, it has taken positive steps toward its two primary goals of promoting stream remediation and encouraging diverse use. These objectives require engaging faculty, administrators, and the community in addressing campus-water management, and WRPC is gradually strengthening this capability. Providing input to campus building-design plans, promoting rehabilitation projects on and off campus, and continuing to monitor stream conditions all contribute to improved creek health. It is, of course, too early to see definitive ecological results, but integrating WRPC expertise into campus-building projects has widened the field of proposed water-management solutions and initiated a discussion of long-term impacts. For example, the Committee formally made several water-related recommendations including that rainwater catchment and low-impact development technologies be included in the revised campus design and construction manual. Although this document is still under review, indications are that the Committee's proposals will be included in the final draft. In terms of the second goal, WRPC supports access to the creek for diverse uses, promoting it as an asset to be remediated rather than an inconvenience for campus development. The Committee has also raised external funds to use the creek as a teaching "laboratory," as well as a focal point for research.

While these new opportunities for sustainability education, research, and advocacy are prerequisites, the ultimate goal is institutional transformation that addresses ecological, social, and economic concerns in an integrated and habitual fashion. This process includes both material changes on campus and cognitive changes in attitude and vision among decision makers. To achieve this step, stakeholders must recognize the need for change, disclose information, provide resources, and share both power and responsibility in process and outcome. For WRPC, such transformation would mean enabling any member to become fully engaged, with some form of compensation, in all stages of decision making for campus planning, even when that role is not part of his or her primary responsibilities. This development would reflect cognitive change among those with responsibility for campus functions and increase shared information, resources, and power. Transformation would also mean an institutional commitment to implementing sustainable water-management practices when the long-term benefits outweigh the short-term costs, and reinvesting the resulting operational savings in further improvements (Sharp, 2009).

Institutional transformation would also include a consistent working relationship between the university and the town, along with relevant interest groups, to sustainably manage water and other common resources. Because water does not stop at the campus-property line, the university can be a "good neighbor" by planning its water resources in concert with the town's sustainable planning initiatives centered on, for instance, "smart growth" and "green business," not only because of the ecological and economic benefits, but also because the town's development and political influence affects the university as a whole. Moreover, there are likely to be consequences in resisting transformation. Within the North Carolina university system, ASU has been designated as the state's "sustainability campus." For the rhetoric to match the reality, sustainable concepts must become a material reality and a comprehensive priority for policy and behavior. In addition, recent legislative attention to water quality and water supply at federal and state levels makes it likely that water-management practices will become more heavily regulated in the future.

The window-of-opportunity approach that we describe below involves three phases of the transformative process: transformative opportunities, transformative action, and institutional transformation.

These phases involve multiple parties, their particular responses to external and internal pressures, and the parties' willingness to adapt their actions in the process of collaboration. Referring to the WRPC case study previously described, we show how new (transformative) opportunities arose and describe the situational characteristics that allowed unprecedented (transformative) action to emerge. Without recognizing the dimensions of transformative opportunity, successful transformative action is unlikely to occur. As noted above, this case study shows that a diverse set of actors was able to leverage windows of opportunity into transformative action, although institutional transformation involving WRPC has yet to occur. The window-of-opportunity concept offers a way to identify when and where transformation *may* occur; it cannot offer any guarantee that transformation *will* occur. If, however, we improve our ability to identify transformative potential in particular situations, we may realize more opportunities to increase sustainability in higher education and similar settings.

Leveraging Windows of Opportunity for Transformation

In this section, we discuss indicators that characterize transformative opportunities and describe them at work in the WRPC case. The ideas discussed here were arrived at through an inductive process based on our joint observations. First, we identify four "actor-groups" and demonstrate how they interrelate. We next describe specific capacities characteristic of transformative action: synergy, collaboration, conflict, and flexibility. The subsequent discussion uses diagrams to "freeze" the relationships among actor-groups at three points in time to visually depict the convergence that makes institutional transformation possible, as well as to highlight what occurs once a window of opportunity has opened. We find that transformative opportunities cannot be directed in advance, but that participation in transformative action depends on opportunism and conscientious attention to collaboration to take significant steps toward the institutionalization of sustainable water-resource management.

Actor-groups

Actors are significant to the transformation process because power–as the ability to attract and distribute resources–is differentially distributed among them. Knowledge is also unequally distributed. But while power and resources are often played against each other in a zero-sum game, knowledge can be accumulated and shared to the benefit of all, through increased understanding of institutional functioning. Sharing knowledge and experience is integral to the synergy and collaboration (shared power and resources) required for institutional transformation.

In this section, we describe the four "actor-groups" in our case study. While WRPC is a university committee, members and partners are accountable to diverse constituencies and professions. By primary responsibility, they separate into four groups: university faculty, university administration, local political authorities, and community-based interests. While the identity of specific actor-groups is unique to any case, three *types* of entities are equally important; individuals, informal associations, and institutions each provide characteristic assets and capacities that can mobilize development processes when they are connected and utilized (Kretzmann & McKnight, 1993). As Figure 1 shows, each actor-group may have numerous constituent members. Among the actor-groups, individuals representing associations and institutions actively "bridge" between two or more groups.

Yet coordination among actors that results in an "open window" is not a straightforward process because participants' interests are rarely unitary. Rather than viewing (virtually) perfect alignment of interests as ideal (Figure 2) or complete autonomy as inevitable (Figure 3), we argue that diverse and divergent interests and responsibilities are characteristic of transformative action (Fazey et al. 2007).

An important feature of our window-of-

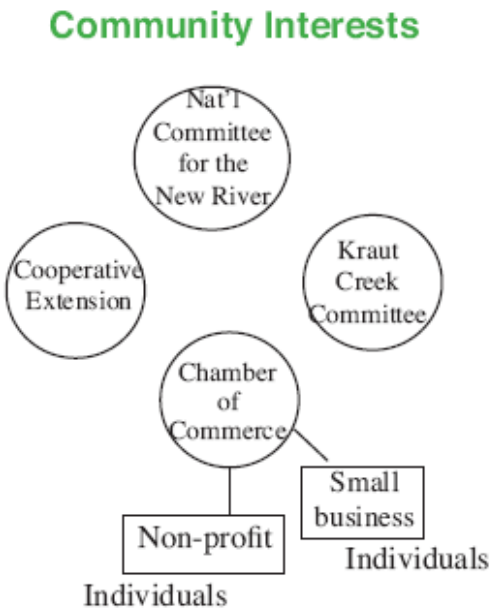

Figure 1 Each actor-group can be divided into its constituent parts and each part can be further divided into its various elements, eventually arriving at the scale of the individual, who may have membership in multiple actor-groups.

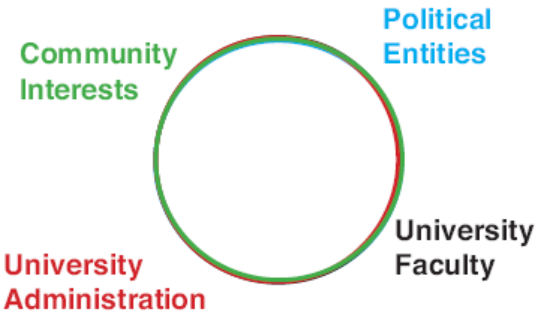

Figure 2 An unrealistic (but sometimes perceived "ideal") situation where all interests are perfectly aligned.

opportunity approach is conceptualizing the situation not as a "moving target" with one preferred condition, but as a fluid field of action in which actors have multiple real and potential mutual interests that can be leveraged toward common goals.

The first actor-group, "community interests," is comprised of individuals and groups associated either with WRPC by professional expertise or an allied community-based organization (or in some cases to both of these networks) and these ties link community institutions, advocacy organizations, and landowner groups. This actor-group includes people who are not necessarily water experts, but who understand the public significance of water problems. In addition to networking, community interests can supply resources, publicity, and educational opportunities, as well as the enthusiasm and appreciation that encourage the difficult work of transformation. Several individual WRPC members are also members of diverse community-interest organizations, including KCC, the National Committee for the New River, and the county cooperative extension office. This integration provides a "bridge" linking various ideas and projects.

Another actor-group, "political interests," describes people who influence policy and strategies affecting campus-water resources. Beyond the extent of state property in the town, the size and scope of university-related activities influence the surrounding area in terms of housing availability, public services, traffic, economic opportunity, and community character. Water-related projects typically "spill over" into the town, requiring collaboration between campus and community-based political interests. Thus, political actors are significant advocates (and adversaries) in attempts to transform the university's material conditions. This actor-group includes elected and appointed officials and government staff. While none of the current members of WRPC are elected officials, some do serve on town boards and are key to "bridging" campus and political interests.

"University faculty" is the actor-group whose primary activity occurs on behalf of education, research, and service based at the university. The faculty members who participate in WRPC range in rank from full professor to adjunct instructor, teach students about water resources, conduct and present externally funded scientific and participatory-action research, and support various community-outreach activities. Enabled by their different fields, affiliations, modes of research and pedagogy, and levels of resources, the university faculty use several methods of persuasion to encourage campus transformation.

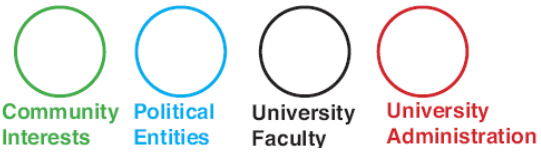

Figure 3 An unrealistic (but sometimes perceived as inevitable) situation where all interests are autonomous.

In contrast, "university administration" is the actor-group directly accountable for the university's physical functioning, as well as its institutional leadership. This actor-group spans responsibilities for campus planning, physical plant operation, business affairs and budget, academic mission, fund raising, and policy development and implementation. The WRPC includes a representative from the operational side of campus activities and his participation has been critical to achieving the transformative actions described in this article.

The establishment, increasing responsibility, and growing influence of WRPC reflect a ten-year history of collaboration among individuals and groups. The experience of working both together and separately, using various tools and methods, and communicating with different individuals is complex, multivocal, and divergent. We identify four capacities–synergy, collaboration, conflict, and flexibility–as necessary characteristics of windows of transformative opportunity.

Synergy

Synergy occurs when multiple actor-groups work to realize similar outcomes. Specific events contribute to each actor-group's focus on an issue and recognition of a common direction with other actor-groups. In the WRPC case, flooding events in 2004, coupled with the 2005 town report on supply limits, focused attention on water throughout the region. Common direction among diverse entities, however, is signified by different forms. The interorganizational, multiscalar context of our case involves, for example, curriculum change, advocacy, scientific experimentation, technological innovation, political negotiation, fundraising and financial investment, citizen involvement, and community festivals. De-

spite their differences, every actor-group recognizes that addressing water-resource degradation with feasible strategies for change requires coordinated action among entities with diverse expertise and responsibilities.

While the actor-group provides the legitimacy and organization necessary for action, it is individuals who create the relationships that bring groups into contact. As noted, actor-groups in our case included several individuals bridging government, university, and community organizations. They leveraged personal and professional relationships to share information, request consideration, and negotiate agreements. These individual actions collectively sustain the synergy among actor-groups. While such synergy does not minimize conflicts, it can support a network of action in the face of occasional conflict and provide energy and motivation. These circumstances pave the way for collaboration, the second capacity.

Collaboration

Collaboration is demonstrated in sharing knowledge and resources, typically toward achieving a common goal. It is clear to all actor-groups that there is no single disciplinary approach and no overarching authority holds responsibility for managing the creek as a complex adaptive social-ecological system (Walker & Salt, 2006). This common awareness promotes collaboration among actor-groups; sharing knowledge and resources from a variety of different areas of expertise is needed to improve local water-resource management. For example, riparian landowners are aware that scientific research is needed on the efficacy of stream-remediation strategies, while scientists require cooperating landowners to grant access to waterways for gathering data. Engineers need community and political leaders to help identify and support potential projects, while almost anyone developing grant proposals needs to identify matching funds among stakeholders, political entities, and community organizations.

Collaboration on common goals both within and among actor-groups maximizes communication among stakeholders, encourages individual initiatives in relation to an overall project vision, and provides a meaningful experience of collective efficacy (Carp, 2008). The forms of collaboration are varied and the relationships involved are dynamic, with interaction levels ebbing and flowing as issues, projects, relationships, and actors evolve. The WRPC relies on significant cooperation at multiple levels, for example, drafting language that captures multidisciplinarity, collaborating between faculty and a campus-project manager to coordinate the logistics with groundskeepers and contractors for university-based research, and communicating with administrators on facility-planning activities. While collaboration creates opportunities (Wondolleck & Yaffey, 2000; Cockerill et al. 2006), it is not a panacea for addressing complex issues (Roberts & Bradley, 1991; Lubell, 2004). As the next sections address, collaboration does not necessarily reduce conflict and it requires flexibility to be sustained.

Conflict

Although conflict is present in most, if not all, group activities, published case studies often ignore it when reporting "lessons learned" and this is a lost opportunity to fully explore how transformation is likely to become manifest. From our combined decades of initiating collaboration in research, community service, and various workplaces, we have found that stakeholders, especially those that are not involved in professionally facilitated collaborative processes, often consider conflict to be a negative aspect of the process. However, conflict can enable stakeholders to see the various tradeoffs and make decisions with that full knowledge, thus helping to achieve consensus (Putnam, 1986; Dooley et al. 2000). Most decisions made by WRPC required working through conflict or conflict avoidance when members withdrew from discussion. In this particular case, evidence of conflict became manifest in disciplinary incommensurability and divergent perspectives on the history of the group and its purpose.

One source of tension has been evident in members' understanding of the impetus for WRPC. Some faculty criticize the lack of previous attention to the creek and hold that the monitoring program and its data collection were the key to the provost's support. Others note that the success of Carp's studio classes, the role of KCC, and various stakeholder activities from 2004-2006 laid the necessary groundwork. Similarly, members disagree about the validity of diverse research strategies. Evidence of serious study for some members requires the accumulation of quantitative data; for others it is careful inventory and analysis of physical conditions; while still others find community-based design alternatives significant. To varying extents, individuals with these perspectives have created loose "factions" within WRPC and the conflicting frames influence discussions about WRPC goals and specific activities.

In addition to conflict within WRPC, there are tensions among actor-groups. For example, relationships among ASU scientists and KCC reflect a classic science/non-science communication barrier. The KCC needs information to plan future projects, but the scientists provide data, not information (Environmental Law Institute, 2007). So the scientists say that the rehabilitation efforts are happening in a "data vacuum" while KCC finds that the re-

searchers sidestep requests for the results of monitoring activities, such as compiling nonscientific reports for use in discussing municipal stormwater policy. Equipment installation uncovered tensions between the researchers and the town when officials ignored requests for placement information. Also, because it is easier for the administration to purchase equipment than to provide personnel resources, Committee members that required research equipment received internal funding, generating a sense of WRPC as a "pork barrel" for the monitoring team. There is also constant potential for conflict with the university administration. Some faculty who teach water-resources management are put in an awkward position when students identify management deficiencies on campus. As Pittman (2004) reports for many universities, at ASU there is significant rhetoric about being sustainable, but actual decisions are still largely based on short-term economics. At the same time, WRPC's increasing role in advising campus-building efforts risks complicating the design and construction process.

Frustrating meetings and communication gaps coexist with synergy and collaboration, capacities that in turn enable WRPC to surmount the political difficulties of conflict and maintain consistency, viability, dynamism, and creativity. Furthermore, conflicts offer opportunities germane to transformative action, including the self-reflection that enables members of an empowered organization to bridge divisions that constrain conscious interdependence–a key tenet of sustainability (Kaplan, 1996). Working through the conflicted issues has strengthened WRPC's capacity to address difficult challenges. The flexible nature of the group and its operation is another key to its accomplishments.

Flexibility

Flexibility is an essential capacity for leveraging windows of opportunity into transformative action because it enables collaboration to continue, thus extending synergy, despite ongoing conflicts within and among actor-groups. Flexibility holds the possibility for conflict resolution, but it also allows actors and actor-groups to maintain a positive relationship in the presence of unresolved tensions. This situation does not mean that the activity of one group is shaped according to the will of another. Flexibility is evident when actors or actor-groups consider the positions and standpoints of others, even when inconvenient or in opposition, and do not obstruct others' initiatives.

The range of disciplines represented within WRPC results in diverse agendas within the group: scientific monitoring, educating secondary school teachers, and revising the campus design and construction manual. As specific activities develop, various committee members take leading roles and others choose not to participate, but the mix of leaders and nonparticipants is fluid. The lack of direct engagement does not always reflect paucity of support, but is simply a matter of time/energy management for each individual member. A nonparticipant in one activity may well be a leader in another.

Interdisciplinary flexibility also occurs in arguing over terms such as "restoration" and establishing realistic expectations, guidelines, and actions for creek remediation (Bradshaw, 1987; Hilderbrand et al. 2005; Palmer & Allan, 2006; Walter & Merritts, 2008). Early in the development of WRPC there was a particularly forceful discussion about whether "stream restoration" was an appropriate goal for the creek. This was resolved by making clear distinctions between "restoration," "rehabilitation," and "continued degradation," so that Carp, for example, was willing to drop the popular umbrella term "restoration" in favor of the more precise, but less politically attractive, term "rehabilitation" that Cockerill prefers.[1] This conflict was not just about semantics; it enabled the group to define a more distinct goal that is not only shared incidentally by individuals, but is an experience of synergy on which future WRPC actions have been built and to which discipline-specific initiatives can appeal for relevance under the WRPC umbrella.

Concurrently, many WRPC members are personally involved in an intense conflict among departments concerning restructuring the university's general education program. However, they are able to step aside from this intellectual collision to sustain their collaboration specific to stream rehabilitation and water resources. The authors are themselves on different sides of this schism, yet value our synergy to the extent that we are able to collaborate on this article, which we intend to represent both conflict and flexibility at multiple scales from individual to actor-group interactions.

As participant-observers, we have developed a greater awareness of flexibility in relation to activities in which we are personally involved. However, the expansion of WRPC's responsibilities on campus indicates flexibility in other actor-groups, evident as a shared capacity to consider different standpoints. This situation sometimes leads to modifying agendas, actions, language, or expectations, such as the provost's willingness to expand the scope of WRPC to include research funding and review of building

[1] These terms tend to be defined on a case-by-case/publication-by-publication basis. In WRPC, a key point of discussion was that "restoration" can imply a return to a presettlement condition, which is idealistic for urban streams. "Rehabilitation," in contrast, has been used to suggest improving ecological conditions without the sense of an indeterminate historic baseline.

plans. Support for faculty involvement from the Office of Design and Construction surprised several faculty who were familiar with the previous bright line dividing the academic and physical sectors of the campus. The WRPC has also been flexible as collaboration with the administration has proceeded. The group has learned more about the considerable complexities inherent in campus development from the administrative standpoint and thus now recognizes that our influence on development policy will vary accordingly. For example, an initial WRPC recommendation for including pervious sidewalks in plans for a new campus building was retracted as the building designers explained that delivery vehicles must use the sidewalks and current pervious pavement technology is inadequate for the weight loads required.

Conclusion

In public policy, a window of opportunity enables a problem, solution, and political support to come together. This space allows advocates to promote their intervention and is typically of short duration (Kingdon, 1984). In some policy domains, windows are predictable (e.g., budget cycles). In our use of the concept, windows of transformative opportunity occur organically and cannot be intentionally generated, although it is possible to recognize when one is forming. Our case study suggests that identifiable characteristics include (1) diverse actor-groups with a common interest or goal. These actor-groups are likely to include (2) "bridging" individuals whose overlapping memberships carry the synergy that brings the diverse groups together (3) to collaborate through sharing knowledge and resources. Once in gear, actor-groups (4) use conflict constructively and (5) cultivate flexibility to further common goals.

Figure 4 shows the nature of actor-group relationships and the window of opportunity. While the figure itself necessarily appears as a static image for this publication, in reality each actor-group is dynamic in membership, resources, and foci. The "past" diagram reflects conditions just prior to the inception of WRPC. As these actor-groups changed, conditions were favorable for them to coalesce, opening a window of opportunity as shown in the "present" stage. Here the actor-groups have converged sufficiently to create WRPC as an unprecedented entity on campus: a collaborative committee among faculty, staff, and community interests with formal responsibility to affect campus (and subsequently off campus) water-resource management. Within this window, institutional transformation can occur, but it requires that the actor-groups sustain the synergy of their common goal or goals and continue their collaboration.

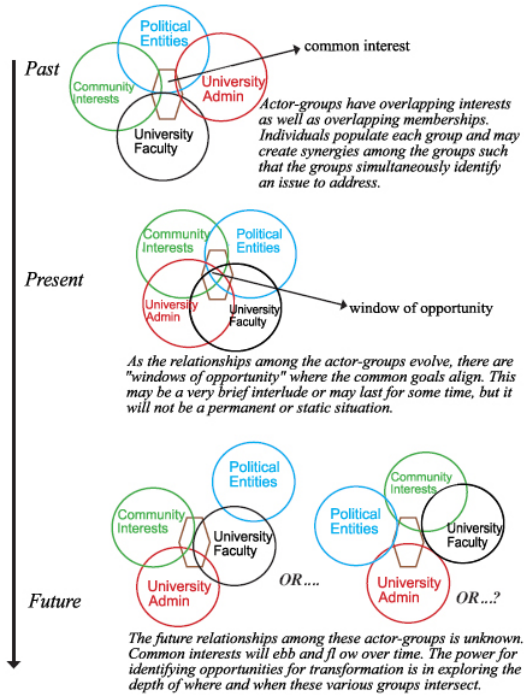

Figure 4 Using WRPC as an example of the "window-of-opportunity" idea.

The "future" stage shows that continuing relationships among these actor-groups are unknown. Common interests and individual participation will ebb and flow. The power for identifying transformative opportunities is in exploring the characteristics of intersection among these various groups. To the extent that each actor-group transforms within its character to institutionally support sustainable water-resources management, it will provide stability for such management as a common vision. Having a particular window close does not mean that transformation has failed. To the contrary, it may mean that it has succeeded and the conditions that opened the window have changed sufficiently to render that particular window unnecessary. The window needs to be open only long enough to provide room for synergy, collaboration, conflict, and flexibility among actor-groups to achieve Ehrenfeld's (2008) notion that the actions become routine and the norms are embodied: transformation has occurred.

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