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## Revitalizing Urban Waterway's Community Greenspace: Streams of Environmental Justice

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### Abstract

While there are many reports of physical demonstration projects that attempt to restore segments and functions of urban waterways, there is no consensus about *what to do* and *how to do it from a social or environmental justice perspective*. We have discovered this during the three years of working on the Onondaga Creek Revitalization Plan in Syracuse, New York, and others have found this to be a major challenge as well. There are also equity issues in terms of who has historically been forced to live in high-risk flood plain or polluted water areas, with marginalized communities being the ones who shoulder the greatest burdens. This paper explores approaches to urban creek and river revitalization, drawing from international case studies from Europe and North America plus the authors' experience with the Onondaga Creek Revitalization Plan in Syracuse, NY. Given the different waterway objectives for both restoration and /or revitalization, there is a need for a collaborative social process, with attention to social equity, in developing such projects and plans. The authors' new book '*Revitalizing Urban Waterway Communities: Streams of Environmental Justice*' (Smardon et al. 2018) presents ways of addressing multiple jurisdictions and diverse sets of stakeholders. European and US case studies present challenging environmental justice issues, and so principles and methods for addressing them are needed (Moran 2007, 2010, Perreault et al. 2012, Platt 2006). Drawing on the concepts of collaborative learning models and coproduction of knowledge, the authors developed a process for community input for urban community waterway revitalization.

### Introduction

There is a need for social process models that can remedy historical environmental justice issues with urban waterway communities not being involved with revitalization or naturalization of local rivers (Hillman 2004 & 2005, Moran 2007, Platt 2006). In many cases, these urban waterways have been historically industrialized, subject to water pollution, storm water flows with attendant flooding and literally physically inaccessible to nearby urban residents. So the environmental justice issue is that these same urban residents have been forced to live adjacent to high flooding risk and water-polluted areas, while also being denied any greenspace benefits from such urban waterbodies. When efforts are made to address these issues, there is often conflict between expert ecology/hydrology goals vs. public knowledge and preferences (Tunstall et al. 1999 & 2000). A key issue going forward is addressing these communication and inclusiveness issues.

The terms used are not very precise, but overall, *restoration* implies speaking mainly from a biophysical restorative functional capacity, e.g., hydrology, water quality, aquatic and riparian habitat. Using the term *revitalization* implies social and economic improvement or revitalized creek neighborhoods with

economically sustainable land use patterns as well as some level of biophysical restoration of the water body. *Naturalization* implies some degree of biophysical restoration of the water body.

## Background & Literature Review

### Historical waterway development and impacts

Urban waterway development in North America focuses on water dependent industry, water transportation and economic development with attendant problems of water quality, flooding and riparian habitat degradation. During the golden age of channelization, many urban creeks were channelized to move floodwaters away from urban areas as well as carry waste materials (Figure 1). As a result, for many urban rivers and creeks, morphology and hydrology were radically changed. In addition there are severe physical, economic and jurisdictional constraints for waterway revitalization.



**Figure 1: Channelization of Onondaga Creek Syracuse, NY. Source: Photo by R Smardon**

Similarly, European urban waterways suffered a similar fate such as historical waterway degradation including water quality and habitat issues. Waterway restoration in Europe really started in the 1970s and 1980s but policy guidance is now more unified there because of the European Union. Both North American and European waterway policy and science history are contained within chapters one and two in Smardon et al. (2018).

### Urban River Restoration: In Brief

In addressing such issues of river revitalization and restoration, one of the early innovators was Judith Petts, now with Plymouth University in the UK. She developed a comprehensive deliberative social learning process for urban river restoration (Petts 2006). Key principles include: maintaining engagement, expert vs. lay knowledge, information for mutual learning, developing a shared vision, and managing the unexpected. These principles were taken into consideration in the Smardon et al. (2018) book along with incorporating principles of environmental justice and political ecology.

So the goal of this paper, and for urban waterway revitalization in general, is to involve previously disenfranchised urban waterway communities within the process of waterway revitalization. Such processes should document previous environmental justice impacts and strive to remediate these impacts through engagement of the affected communities.

#### Framing Environmental Justice (EJ) & political ecology for stream restoration

An EJ definition utilized in the US is “fair treatment and meaningful involvement of all people regardless of race, color, national origin or income with respect to the development, implementation and enforcement of environmental laws, regulations and policies” (EPA 2017). Several other authors of environmental justice concepts or frames discussed below include Bullard (1990), Capek (1993), Taylor (2002) and Pellow (2000).

Bullard (1990) presents marginalized communities as being paths of least resistance so that they become targets for environmental waste sites or other kinds of environmental degradation. Capek (1993) discusses EJ components such as the right to accurate information, unbiased hearing, democratic participation, compensation, plus development of solidarity between/across groups. Taylor (2002) presents an EJ paradigm that includes six principles; 1) ecological principles, 2) justice, 3) autonomy, 4) corporate relations, 5) policy, politics and economic processes, and 6) social movement building. Pellow (2000) developed the Environmental Inequality Formation, which states that injustices result from a socio-historical process and not a discrete event, involves multiple stakeholders, and should incorporate life cycle analysis.

The above classic frames all rely on two key EJ principles that will be the focus throughout the remainder of this paper: distributive and procedural justice. *Distributive justice* examines who benefits or incurs costs and *procedural justice* looks at who is included particularly in decision-making processes, when and how.

Some specific procedural and distributive EJ waterway restoration issues include:

- Who made decisions, who paid, and who benefits (Honey-Roses 2008, 2070);
- Differential government spending can recreate unjust relationships (Moran 2007);
- Who is being heard or not heard (Moran 2007);
- Privileged rural or ecologically rich green spaces may get more attention than urbanized areas (Moran 2007);
- Access to accurate and understandable information (Capek 1993); and
- The comfort level of citizen involvement, the form of water governance, and stakeholders may have different visions.

Finally, there is the issue of *solidarity* – the types of partnerships and stakeholders/organizations affecting collaboration in planning and management.

Who benefits or distributive justice issues include: community burdens, community benefits, and fear & uncertainty around restoration. Also the issue of displacement of communities & gentrification such as Calumet River case (McKendry & Janos 2015) must be considered under distributive justice.

The other key conceptual frame is *political ecology*, which includes power relations and dynamics. Political ecologists have pointed out the need to explore underlying dynamics of relationships (Robbins 2015), drawing attention to the complexities in causal relationships, interrogating the complexity of socio-

environmental dynamics along a time scale, and exploring ways that political, economic and ecological processes work together. There is a general lack of underpinning of political ecology or EJ in most waterway revitalization, so we proposed to look at a number of cases to see just how EJ and political ecology were treated as part of the urban waterway revitalization process.

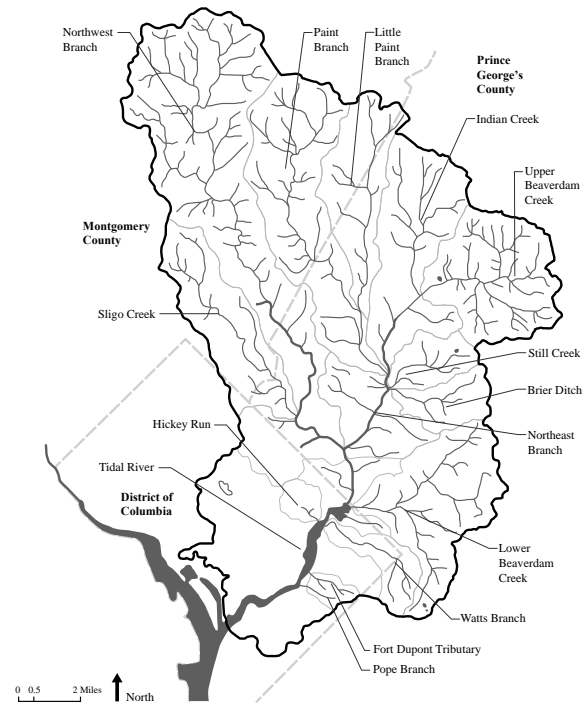
## Methods

We analyzed EJ leadership environmental justice and intergenerational equity with five case studies; Anacostia River, Washington DC, Bronx River, New York, Mill Creek, Philadelphia, PA, Chattanooga Creek, TN, and Onondaga Creek, Syracuse, NY. “*Intergenerational equity* in economic, psychological, and sociological contexts, is the concept or idea of fairness or [justice](#) between generations. The concept can be applied to fairness in dynamics between [children](#), [youth](#), [adults](#) and [seniors](#), in terms of treatment and interactions. It can also be applied to fairness between generations currently living and generations yet to be born” (Wikipedia 2017)<sup>1</sup> Intergenerational equity considerations include legacies of institutional racism through redlining, Jim Crow, and similar practices affecting urban waterway communities. These historical EJ issues continue to influence property ownership, family assets, wealth and community development as we will see in these case studies. Each case was profiled with attention to leadership characterization, neighborhood demographics, initiation of revitalization process, main reasons for initiating process, strategies used and outcomes. Much more detail is provided in chapter five in Smardon et al. (2018).

## Results

The following are brief profiles of the five case studies. A comparative summary of results is provided in the following discussion section.

## Anacostia River, Washington DC



**Figure 2: Anacostia watershed map. Source: Smardon et al 2018, 69**

*Leadership:* Two organizations the Anacostia Watershed Partnership and Groundwork DC were the major actors providing leadership;

*Demographics:* Southeastern river area is predominately black and lower income and part of Northeastern area is white and wealthy;

*Initiation:* This was a joint effort by government, environmental organizations and private citizens;

*Reasons* for the restoration were to re-establish ecosystem health, community development and recreation;  
*Means* include a water quality lawsuit against the US Navy and other polluters and a media campaign; and

*Outcomes* include some water quality improvements and some community displacement.



**Figure 3: RFK Stadium on the Anacostia River. Source: Smardon et al. 2018, 89**

Bronx River, New York City



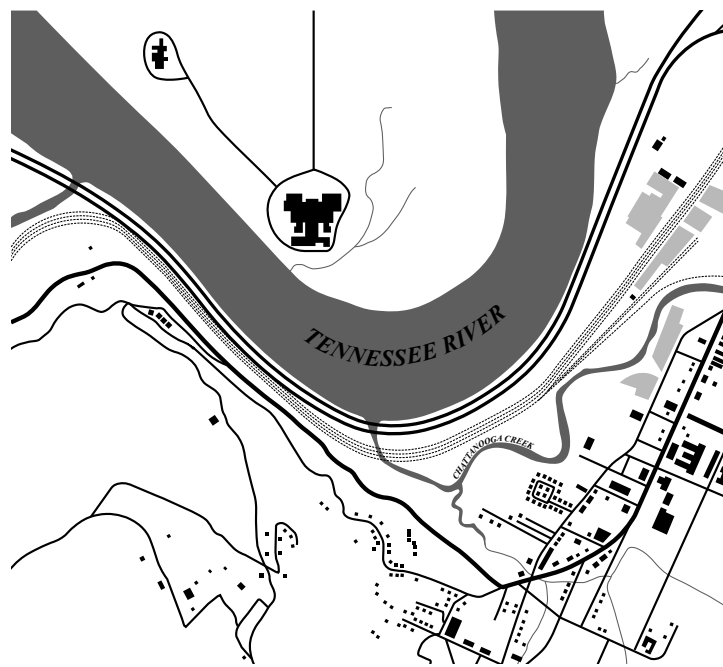
**Figure 4: Map of South Bronx Source: Smardon et al. 2018, 67**

*Leadership* was from the Bronx River Alliance and Bronx River Working Group; *Demographics* of the south Bronx are 24.4% black and Hispanic- one of the poorest in US; *Initiation* was from community activists but multiple organization plus public agencies became involved; *Reasons* include ecological river restoration and provide community access and greenspace benefits; *Means* include collaboration between civil society and government plus some confrontational tactics; and *Outcomes* include significant gains in riverfront greenspace and public awareness.



**Figure 5: Golden ball event on the Bronx River. Source: Smardon et al. 2018, 86**

Chattanooga Creek, Tennessee



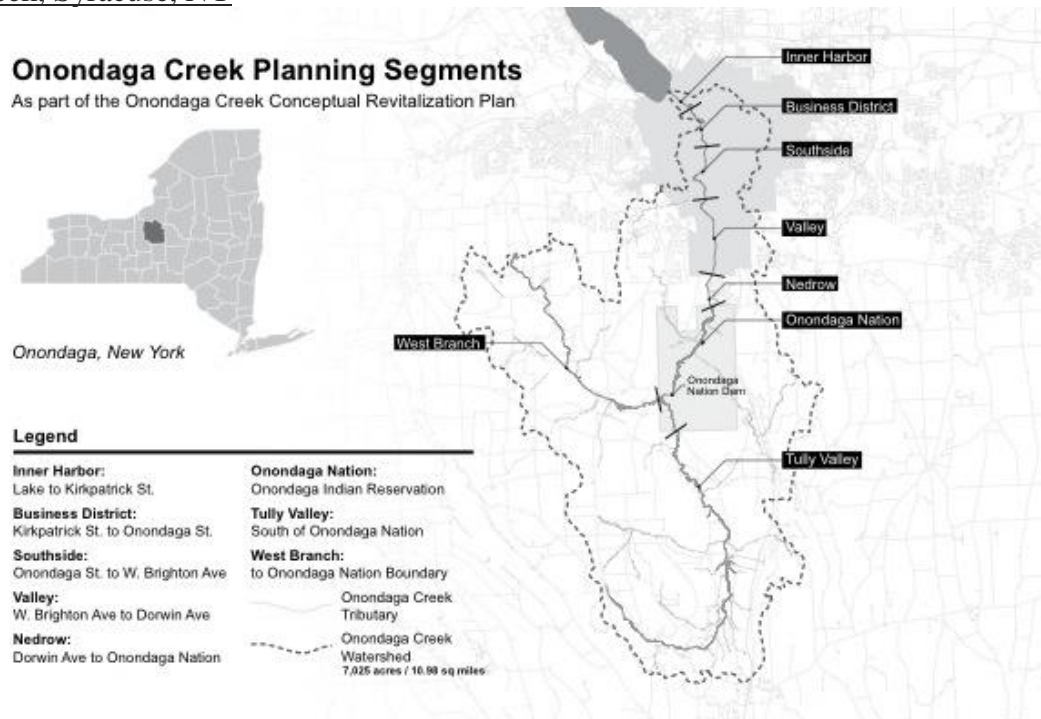
**Figure 6: Map showing Chattanooga Creek & Tennessee River Source: Smardon et al 2018, 71**

*Leadership* was provided by NGO Stop Toxic Pollution and Alton Development Corporation;  
*Demographics*: Alton Park is mostly black and 58% in poverty, while Pinewood is largely white with 26.2% in poverty;  
*Initiation*: Community group initiated by the NGO as an EJ pollution issue;  
*Reasons*: Heavy industrial pollution with site on the National Priority list;  
*Means*: include public meetings, official EPA meetings, charrette to set community priorities; and



*Outcomes* include neighborhood improvement, health services, education, housing, job training and abandoned properties.

### Onondaga Creek, Syracuse, NY



**Figure 7: Onondaga Creek watershed in central NY, USA Source: Smardon et al. 2018, 101**

*Leadership* was provided by the Onondaga Nation, Atlantic States Legal Foundation (NGO), as well as County, State, Federal government for water quality cleanup (Perreault et al. 2010);

*Demographics:* Indigenous Onondaga Nation, African American south side and southern rural areas;

*Initiation:* NGO initiated lawsuit for water quality, Combined Sewer Overflows (CSO), and lake cleanup;

*Reasons:* Water quality compliance as part of lake cleanup;

*Means:* Lawsuits plus gray and green infrastructure to reduce CSO outflows; and

*Outcomes:* Creek revitalization plan, creek walk and infrastructure limit CSOs.



**Figure 8: Onondaga Creek walk linking Franklin Square to downtown Syracuse.**  
Source: Photo by R. Smardon

Mill Creek Philadelphia



**Figure 9: Mill Creek Neighborhood Map. Source: Smardon et al 2018, 71**

*Leadership:* Landscape Literacy Project and Mill Creek Coalition;

*Demographics:* Predominantly African American –poorest neighborhood in Philadelphia;

*Initiated* by an outside academic (Spirn 2005);

*Reason:* Raise awareness in the community about the creek;

*Means:* School projects and community workshops; and

*Outcomes:* National recognition of environmental literacy, but limited local action.

## Case Study Discussion

### Comparative case study analysis

In terms of *leadership* and *initiation* almost all these cases are led by local citizen advocate groups, which are sometimes merged with government and other organizations in an umbrella group like the Bronx River alliance. In terms of *demographics* many of these cases involve a distinct socio-economic and racially different community adjacent to a more affluent white majority community. The former community, in most cases, has historically suffered environmental justice impacts with little recourse for mitigation. *Reasons for restoration or revitalization* often include addressing water quality and historical flooding issues which are, in some cases, merged with socio-economic community revitalization. *Means* often means legal action, such as in the Anacostia, Chattanooga and Onondaga cases. In the Bronx River case in was much more of a combination of means. *Outcomes* are quite varied across the different cases. In all cases there was increased awareness of the EJ issues. In the Anacostia, Bronx and Onondaga specific remediation or revitalization plans were developed. Probably the Bronx River was the most successful in seeing multiple outcomes and community benefits which partially remediated EJ and intergenerational equity issues

### Challenges with EJ analysis and frames

It was often difficult working across time with corporate and government negligence. When funding or leadership or municipal jurisdictions change, this can cause lack of continuity of actions and implementation. In the Anacostia River case, there were problems in defining who was responsible for the water pollution regulation and who would pay for cleanup. There were also private foundations who were proposing urban revitalization who had different goals than private development corporations.

There often is lack of maintenance and enforcement (Rogge et al 2005). Even in Superfund cleanup cases such as Chattanooga creek – lack of state or federal enforcement plus industry malfeasance limits action. The local community group NGO Stop Toxic Pollution mounted a legal case against the waterway polluter, but the US EPA Superfund process took a time and effort to remediate the situation as it wound through the process of cleanup.

There are often changes in local project management. Shifts in agency jurisdiction and funding such as the Onondaga Lake Cleanup affect implementation in addressing EJ situations. For the Onondaga Creek and Lake Cleanup there were two such situations. For near south side African American community, a CSO treatment facility was sited within a neighborhood that was previously impacted by industrial development. The indigenous Onondaga Nation was initially included in the Superfund Natural Resource Remediation Assessment & Plan and later pulled out of the process when they could not put dollar amounts on loss of their cultural resources.

There is often internalized racism, e.g. Mill Creek neighborhood was labeled as the “bottom”. For Mill Creek, the local school students did not connect the word bottom as an environmentally degrading term nor recognized the social and economic implications. This may lead to lack of efficacy, which hampers restoration progress (Spirn 2005). The students became depressed when they found out what the term ‘bottom’ met both from an environmental and socio-economic perspective. Even though there was

heightened awareness of the state of Mill Creek – there was not enough impetus to move toward remediation of the creek through day lighting or other costly remediation measures.

There is concern about intergenerational equity work continuation. This is a concern with environmental NGOs in terms of leadership and continuation as the original members age or disengage. An example is the Bronx River case where the initial advocate leaders had aged and there was concern over who would take on the leadership role for future generations.

### **Normative Discussion - How to address the EJ issues identified above**

The following is a series of strategies presented in more detail in Smardon et al. (2018) to address EJ concerns and promote social process of engagement.

*Enhance public engagement* in waterway revitalization via social learning approaches such as: agent-based modelling, citizen juries, art-based engagement, and interactive dynamic modelling. Promote corridor scale & waterway stretch engagement by:

- Developing landscape literacy like Mill Creek (Spirn 2005);
- Future waterway visioning (Selman et al 2010);
- Building watershed narratives (Yocon 2014); and
- Place-based conservation (Wessels 2010).

*Restoring streams and relationships* can be done via the following means:

Reconstructing the historical context of urban waterways and relationships to surrounding communities. Examples include Mill Creek in Philadelphia (Spirn 2005) and Hunter Valley in New South Wales Australia (Hillman 2004, 2005). Also, one could build a mechanism for waterway stakeholders to be engaged in ongoing social learning. Examples include the South Bronx (Marshall 2001) and Los Angeles River (Wessels 2010, Wolch 2007). We need to understand and address revitalization objectives of residents that may not be the same as government or experts (Nassauer et al 2001, Petts 2006, 2007) and devise ways of developing socially and culturally sensitive metrics to assess pre and post project outcomes. An example would be the River Skene project in the UK (Tunstall 1999, 2000).

*Community engagement and mapping* by identifying community spaces and attributes:

There is a need for physical, social and psychological perception data via participatory GIS, agent-based modelling, participatory design, decision support systems and crowd sourcing. The National Science Foundation is proposing use of the following systems for such water resource projects:

- Integrated models to redirect hydrologic, human and ecosystem impacts from GI design at site to catchment scale;
- Interactive methods for crowdsourcing for model parameter setting; and
- Implementation of modeling and crowd sourced design methods in a cyber infrastructure frame.

*Urban Waterways as green infrastructure (GI)* to remediate past damage:

GI can be used to remediate or enhance riparian habitat, improve water and air quality, carbon sequestration and provide recreational, aesthetic and human health benefits. Examples include the Des Plaines River Wetland demonstration project north of Chicago and South Bronx River in New York City. One can use ecosystem service assessment and valuation to account for GI benefits.

Process for assessing urban waterway ecosystem service (Defra 2007), which has the following steps:

- Establish environmental baseline;
- Identify and provide qualitative assessment of the potential impacts of policy options for ecosystem services;
- Quantify impacts of policy options on ecosystem services;
- Assess the effects on human welfare; and
- Values the changes in ecosystem services provided.

*Creative Engagement* can also be used to bring attention to waterway revitalization or restoration. The use of creative arts to reconnect the community with their urban waterways. See the following examples (Figures 10-13) for use of creative engagement in San Diego, Onondaga Creek NY, Los Angeles River, CA, and Paris, France:

### San Diego murals



**Figure 10: Mural by Victor Ochoa, “All the Way to the Bay,” in San Diego’s Chicano Park Source Photo by Jimi Giannatti**

### Onondaga Creek sound walk



**Figure 11: Sound art project with developers and listeners, At Syracuse University walking along Onondaga Creek, Syracuse NY. Source: photo by Fereshteh Toosi**

### Waterbird graffiti in Los Angeles



**Figure 12: Graffiti in Los Angeles CA depicting wetlands, urbanization and the slogan “Creatures of Justice” Source: Umberto Brayj/CC BY 2.0**

### Participatory swimming acts - Seine River in Paris



**Figure 13: People diving into open water in Paris, France as part of a wild swimming event. Photo by Oliver Ortelpa**

### Conclusions

Environmental Justice and Political Ecology have not been widely used as a frame for urban waterway revitalization. Historically disadvantaged communities have rarely found a voice in the process. Five

different urban waterways are examined from a combined environmental justice/political ecology frame (Smardon, Moran, and Baptiste 2018). Specific attributes of leadership, demographics, initiation, reasons for, strategies used, and outcomes of waterway revitalization process are examined. Several social process issues are surfaced. In addition, social learning processes are presented to allow positive addressing of procedural and distributive environmental justice issues. These processes include public engagement participation, restoring community waterway relationships, interactive graphic mapping exercises, use of green infrastructure, assessing ecosystem benefits and use of creative arts –all to reconnect waterway and community.

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