



BRIDGING THE DIVIDE

***Connecting Stormwater and Floodplain
Management in Oregon***

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**WILLAMETTE
PARTNERSHIP**

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Introduction

Our water resource management challenges are significant and often complex. We are trying to manage the flooding effects of more and more intense storms, the adverse effect of past and present urbanization on watershed processes, and loss of habitat that affects native migratory fish, among other things. There is a growing recognition that we cannot meet today's water resource challenges by working in silos - with wastewater, stormwater, drinking water, groundwater, and flood waters addressed separately. Communities are now looking for the policy and planning tools to meet these challenges efficiently *and* to help them become more resilient. They are looking for ways to address multi-faceted problems with integrated solutions.

In Oregon right now, the intersection of stormwater and floodplain management is particularly relevant. Floodplains and stormwater may be distinct legal arenas, but they are hydrologically connected and the state and federal regulatory programs that govern them are changing.

- **Stormwater:** The municipal separate storm sewer system (MS4) permits require action to address the water quality impacts of stormwater. Oregon Department of Environmental Quality's (DEQ) MS4 permit program continues to evolve, increasing a community's obligation around monitoring and management, and in some cases, the effects on watershed hydrology.
- **Floodplains:** The 2016 Biological Opinion, issued by the National Marine Fisheries Service (NMFS BiOp), for FEMA's National Flood Insurance Program is driving planners and floodplain managers to think more about addressing the water quality, hydromodification, and habitat impacts of stormwater as a means of protecting endangered species in floodplains.

Over the past year, Willamette Partnership and Oregon Association of Clean Water Agencies (the Project Team) have been collaborating to better understand the intersection between stormwater and floodplain management, seeking to bridge the divide between these silos of water management and helping communities realize the benefits of an integrated approach – more efficient, effective, ecologically and economically resilient approaches to surface water management.

This effort, funded by the Oregon Community Foundation, included interviews and a collaborative workshop with stormwater managers, floodplain managers, city planners, and other water resource managers and decision makers from 10 communities across Oregon to:

1. Build a common understanding of regulatory obligations related to stormwater permits and the NMFS BiOp, focusing specifically on where they can overlap;
2. Inform integrated approaches to policy and planning that meet stormwater and floodplain requirements.

This report provides i) a brief overview of the way that regulatory drivers and local programs affect stormwater and floodplain management in Oregon, ii) a summary of the challenges to and opportunities for integrated strategies identified through interviews and the workshop, and iii) recommendations for moving forward together. The report is intended to inform discussion around the connections between stormwater and floodplain management, and the development of efficient and effective approaches that water resource managers can take to meet the surface water challenges that communities face.

Background

The following sections provide a brief summary of the regulatory programs that drive stormwater and floodplain management in Oregon.

Stormwater Management

Stormwater discharges from Oregon communities are regulated under Oregon DEQ's municipal separate storm sewer system (MS4) permit program, which aims to control the impacts of stormwater discharges on water quality.

MS4 permits fall into two categories based on the size of the MS4 system. The Phase I MS4 permit program requires medium and large cities with populations of 100,000 or more to obtain NPDES permit coverage for their stormwater discharges. Phase II MS4s cover populations less than 100,000 located within urbanized areas (as defined by the census bureau). All MS4 permits prohibit non-stormwater discharges into the MS4 and require a community to reduce pollutants to the Maximum Extent Practicable, which is primarily defined by implementing an approved Stormwater Management Plan (SWMP). For Phase II MS4 permittees, the SWMPs have 6 minimum control measures:

1. Public education program to educate the community about the impacts of stormwater and the steps that the public can take to reduce pollutants in stormwater runoff.
2. Public participation process as a part of their on-going stormwater management program
3. A program to detect and eliminate illicit discharges.
4. A program to reduce pollutants in any stormwater runoff to the permittee's MS4 from construction activities that result in a land disturbance > 1 acre (Phase II), or 1,000ft² (Phase I).
5. A program to address pollutants in runoff from new development and redevelopment projects that disturb > 1 acre (proposed for new Phase II permits), 1,000 – 5,000ft² (some Phase Is).
6. An operation and maintenance program to prevent or reduce pollutant runoff from municipal operations.

Oregon's Phase I permits are more stringent than Phase II permits in a number of ways. For example, most Phase I permits have more comprehensive monitoring requirements, requirements related to assessing and addressing the effects of stormwater on the watershed hydrology (hydromodification), and a strategy for retrofitting existing development. Phase I permittees are required to have a stormwater manual that guides development and redevelopment activities to implement a site-specific plan to mitigate the volume, timing, duration, and pollutant concentration of stormwater from the site. A new Phase II general permit is currently under development that would bring the Phase II requirements closer to those of a Phase I.

Floodplain Management

Over the past several decades, floodplain management in Oregon has been primarily driven by standards and requirements outlined in the National Floodplain Insurance Program (federally backed flood insurance). Those requirements are implemented by local governments through regulations, zoning codes, ordinances and plans that cities and counties develop to mitigate the damaging effects of natural hazards including floods.

Local governments are required, at a minimum to:

- Require permits for all floodplain development;
- Ensure specific measures are taken to avoid or reduce flood damage for new construction and substantial improvements;
- Ensure that encroachments into the floodway portion of the 100-year floodplain are prohibited if there would be any increase in flood levels
- Notify permit applicants that other state and federal permits may be required (for example, wetland fill permits, permits for work in navigable waterways, etc.) and ensure that the applicant obtains required state and federal permits; and
- Educate local citizens about local flood hazards and local floodplain regulations.

In April 2016, after six years of consultation¹, the National Marine Fisheries Services (NMFS) released a Biological Opinion (BiOp) on the implementation of the National Floodplain Insurance Program (NFIP) in Oregon concluding that floodplain development degrades habitat, water quality and hydrological conditions essential for endangered fish species. The BiOp outlines several key requirements for how local governments will need to regulate and manage floodplains in order to be compliant with the Endangered Species Act including: updated floodplain mapping; avoidance, minimization and compensatory mitigation of impacts to high hazard floodplain areas; data collection and reporting; and compliance and enforcement. Collectively, these requirements are referred to as the Reasonable and Prudent Alternative or RPA.

NMFS expects that it will take 2 to 5 years for FEMA Region 10 (and local communities) to fully comply with the BiOp. In the meantime, FEMA and communities are expected to follow some immediate steps to limit impacts to floodplains - primarily, prevent any unmitigated development in the floodplain. Communities will need to implement these Interim Measures within two years (i.e. by March 2018) to qualify for ESA coverage under the Incidental Take Statement included in the Biological Opinion.

Stakeholder Synthesis

Through a series of interviews and a full day workshop, the Project Team gathered insight from stormwater managers, floodplain managers, city planners, and other water resource managers and decision makers in communities across Western Oregon about the challenges and opportunities to integrating stormwater and floodplain management. We found no shortage of challenges, but also a wealth of ideas on how to move forward and examples of individuals and organizations leading the way to coordinated and resilient surface water management.

Challenges

Several themes emerged from managers' discussion of the challenges or the barriers that they have faced in seeking coordinated approaches to stormwater and floodplain management. The conversations focused on the planning, regulation and policy, project implementation, and communications and

¹ In 2009, several environmental groups filed suit against FEMA for failing to consult with NMFS regarding the impacts of the NFIP on endangered species in Oregon as required by Section 7 of the Endangered Species Act. In 2010, FEMA entered into a settlement agreement with the plaintiffs of that suit and began consultations with NMFS over the implementation of the NFIP in Oregon.

outreach elements of management. The challenges described here were generally applicable to each of those management areas.

The first and most often mentioned challenge was silos - the institutional organizing units that create natural barriers to communication and coordinated action. Regulatory authority is divided among multiple agencies (e.g., Oregon DEQ, NMFS, Department of Land Conservation and Development, FEMA) that may or may not communicate with each other. Local government functions are also split between entities and departments. In many cases, flooding and floodplains are managed by the county, planning department, and/or emergency management service, while stormwater management tends to be under the purview of a water utility, a separate stormwater utility, and/or public works.

Another significant challenge that managers face is the need to make the case to decision makers to preserve the physical space that watersheds and river systems need to support infiltration and an active floodplain. We heard multiple times how difficult it is for land preservation and restoration to compete with development. Development has a clear and immediate value to the public. The infiltration value of open space at the parcel level or undeveloped floodplain areas is not as easy to define nor as likely to compete with the short-term value realized by developing housing and local business. This is particularly true under Oregon's land use planning system, which favors density. City council members and the public want to see decisions that benefit the public today. We don't necessarily have the technical tools to make the case for preserving that space and its natural functions, and even when we do, it is most likely to pencil out over a much longer time frame than is relevant to politicians.

Opportunities

Managers identified opportunities under four different action areas – regulation and policy, project implementation and finance, planning, and outreach and education. These action areas align with how local governments administer water resource programs.

Regulation and Policy

Communities can integrate stormwater and floodplain management in how they respond to regulatory programs and policies (e.g. the MS4 permit program and Combined Sewer Overflow (CSO) control programs administered by DEQ, and the National Flood Insurance Program (NFIP) and the 2016 Biological Opinion administered by FEMA). The effect of silos is felt strongly in this arena, where different regulatory programs cover different facets of watershed function (e.g., Underground Injection Control, Combined Sewer Overflow, Total Maximum Daily Load, MS4 permits, Endangered Species Act, and the NFIP). Each program has its own objectives and criteria or methods/models for assessing compliance. More often than not, these programs are not coordinated or aligned, creating conflicting requirements that jurisdictions need to figure out how to address efficiently.

The most important opportunity to overcome is a fractured set of regulatory drivers is strong and consistent internal communication and coordination, which looks different for small vs large organizations. In small utilities/municipalities, it looks like discussions between staff agencies and departments. In larger utilities/municipalities where departments are larger and more complex, it's more likely one person's job to coordinate the response from multiple departments or multiple agencies, acting as an intermediary. For example, the City of Portland has one staff member designated to track progress of the Biological Opinion and coordinate

response across different departments. In a smaller utility, it may be the same person implementing programs for these different regulatory drivers, or few enough people to have all of them coordinate directly with the others.

An important, but perhaps more challenging need is to improve the actual policies driving water resources management. A municipality is a regulated entity; but it is also a policy maker and it has an opportunity in its role as policy maker to make thoughtful policy and adapt it over time. Municipalities also have the opportunity to inform that process for the agencies that regulate them. Policy opportunities exist in three areas:

- 1) Development of policies that lead municipalities to be more proactive in addressing water resource needs. Our water resources management policies tend to encourage the development of 'reactive' strategies (i.e. how do we fix existing problems?) instead of promoting proactive strategies (i.e. how do we prevent problems from occurring in the future?).
- 2) Development of policies that support better coordination or alignment across regulatory programs, limiting conflicting requirements from programs that each have its own objectives and methods/models for assessing compliance that jurisdictions need to figure out how to address.
- 3) Policies that help identify "clear and objective standards," such as those required in Oregon's housing policies,² and provide helpful guidance. Clear and objective standards are those code requirements with definition or measurement that provide for consistent interpretation of the standard.³

Planning

Communities may have the opportunity to integrate stormwater and floodplain management within local planning efforts, which often include community comprehensive plans, stormwater management plans under MS4 permit programs, stormwater master plans or asset management plans, and floodplain management, natural hazard mitigation plans, emergency response plans. The processes through which they are developed may or may not include significant inter-departmental or inter-agency coordination and public engagement.

For example, the City of Salem used existing requirements from their Stormwater Master Plan, Natural Hazard Mitigation Plan, and Emergency Management Plan to help shape their floodplain management plan. They also engaged staff from across eight departments within the City (including Stormwater Operations, Natural Resources, Building and Safety, and Public Works Engineering) to ensure the floodplain management strategies and action items had the

² Oregon Revised Statute 197.307: Approval Standards for Certain Housing in Urban Growth Areas, and Oregon Administrative Rule (OAR) 660-007-0015: Clear and Objective Approval Standards Required

³ Code language such as *complementary to, enhance, integrate or incorporate* (without stating how much), and *visually engaging*, are examples of discretionary language found in the current CDC that must be more clearly defined in order to meet the clear and objective requirement. Identifying specific design elements and quantities that must be included in a building design can provide the detail needed for the standard to become clear and objective. From:
http://www.ci.oswego.or.us/sites/default/files/fileattachments/planning/calendarevents/20610/clear_and_objective_housing_stnds_handout.pdf

opportunity to work in tandem with or support other water resources management issues within the City. The planning efforts were additionally guided by requirements outlined in FEMA's Community Rating System – a voluntary incentive program designed to reduce flood risk above and beyond what the NFIP requires and includes activities such as developing a comprehensive stormwater management plan and restoring natural floodplain function.

Extending the spatial and temporal planning horizon may also be an important strategy for municipalities striving for an integrated and efficient approach to surface water management. Most stormwater and floodplain management plans focus on existing and near-term conditions. Their scope and scale limit our ability to estimate the potential upstream and downstream impacts of development on community safety and floodplain function and the impact of future events on the same. In addition, many wetlands and floodplains are part of the buildable land supply that cities are required to maintain within their urban growth boundary (per Comprehensive Planning Goal 14). It is very difficult politically to set aside those parcels.

Watershed-scale planning efforts that account for both the current condition of the developed landbase as well as the predicted impacts of a fully developed/built-out floodplain could provide evidence and/or a justification for why communities need to maintain options for future flood storage or stormwater controls. Build-out summaries – projections to estimate potential development that may occur at a future time of buildout – are used by some communities to identify likely infrastructure needs across sectors (e.g., transportation, education, drinking and waste water service). The current approach to floodplain cut and fill only considers impacts and benefits at a project-level, and in so doing, misses the opportunity to assess cumulative impacts and benefits at a watershed-scale. Watershed-scale, long-range planning for stormwater management holds equal promise in terms of identifying significant, cumulative impacts from individual development actions and identifying the best opportunities to preserve or enhance watershed function.

Some tools that have been applied to improve (i.e. to integrate and/or look at broader scales) the planning process in other parts of the country include:

- *Community Benefits Agreements* which are contracts that tie project developers and stakeholders to goals that support a project-affected community;
- Development review process that evaluates projects over a longer term and takes into account different development scenarios; and
- FEMA's Future Conditions Flood Mapping,⁴ conducted at the request of a community, which identifies the 100-year flood under a full build-out scenario.

Implementation (Best Practices and Project Financing)

Communities can integrate stormwater and floodplain management by implementing or requiring action on the ground that serves both purposes, namely restoring natural hydrology

⁴ FEMA 2015. Guidance for Flood Risk Analysis and Mapping. Riverine Mapping and Floodplain Boundaries Guidance Document 60.

and restoring stream channel complexity and connectivity to the floodplain. The State of Pennsylvania, for example, uses floodplain restoration as a best practice for stormwater management while in Birmingham, Alabama, floodplain buyouts are used as a regional stormwater best management practice and are considered to be low maintenance, permanent mechanisms to meet TMDL implementation requirements. In addition, the NFIP's Community Rating System includes [Stormwater Management](#) as a floodplain management activity to improve water quality that can earn participating communities CRS Credits.

The most significant challenges to these kind of projects is that they are expensive, potentially involving property buy-outs, significant permitting, and technical analysis to ensure the resulting stream channel can function under the current (usually modified) hydrologic regime.

One way for municipalities to finance this kind of restoration project is by developing their own mitigation banks (for wetland or floodplain function). A municipal mitigation bank program can 1) have the flexibility to meet their own offset obligations in a way that contributes to broader city goals, and 2) potentially save money and/or generate revenue for continued project development. The City of Eugene develops wetland mitigation banks to meet impact needs, siting wetland mitigation projects to fit into the higher level environmental goals for city.

Another opportunity for financing large restoration projects is the Clean Water State Revolving Fund (SRF), a low interest loan program administered by Oregon DEQ. This is a very affordable source of funding for restoration projects with multiple benefits that can be funded through non-traditional sources.

Outreach and Education

Efforts by municipal governments, stormwater utilities, and floodplain managers to provide information to the public and elected officials about the fundamentals of water resource management provide a lot of potential opportunities for integration.

One of the main challenges associated with outreach and education is the need to make the case, both to the public and within water resource management departments, that there are advantages to better integrating how we manage stormwater and floodplains/flood water. A second challenge is that efforts that deliver similar messages in different ways may inadvertently contribute to confusion. For example, allowing development in the floodplain on the one hand while touting the ecological and water quality benefits of floodplains on the other sends a mixed message to the public about the value that functioning floodplains provide to a community. As such, local strategies for a strong, coordinated outreach and education program outreach and education could:

1. Develop clear, consistent messaging around "clean water." "Clean water" is a concept or term that resonates with everyone;⁵ however, work is needed to

Wendell Berry's Golden Rule:
"Do unto those downstream
as you would have those
upstream do unto you"
serves as an effective
message for why we all need
to care about clean water.

⁵ DHM survey, conducted for ACWA MS4 Phase I permittees, concluded that Oregonians care about Clean Water

build both shared understanding of how to better protect it and shared ownership in taking those actions. Options to do this include:

- Communicate that **both** the public and regulators care about clean water include the use of terms like “we” and “us”.
- Broaden the public’s understanding of local watershed hydrology and flow control (e.g. develop a graphic/animation of the path of travel of water from headwaters on down to underscore its connectivity).
- Broaden elected officials’ understanding of the value of water by building a “business case” that estimates the full costs of loss of floodplain function due to development. This may include the value floodplains can provide as community assets through improved air quality, recreation opportunities, and water quality. It may also include cost savings that homeowners would receive if the community receives a better ranking in FEMA’s Community Rating System.

2. Identify new approaches to implementing the municipality’s outreach and education strategies. For example:

- Tailor message delivery to specific audiences;
- Build local champions (e.g. conservation/green oriented champions; commercial-oriented champions); they seem to be a common feature of successful water resource management programs;
- Use storytelling to engage people and connect with public values.

There are several existing resources – such as the Clean Rivers Coalition and the FEMA Community Rating System – that provide models/good guidance and structure on communication strategies.

Recommendations

The clearest recommendations that emerged from this project speak to individual staff members within local government, municipalities, or utilities. They relate to both the short term (weeks to months) and the long term (one or more years).

Short term

Today, tomorrow, or next month, there are actions that managers can take to increase coordination between stormwater and floodplain management, making space for integrated projects, policies, plans, or communication initiatives, such as:

- **Join the Clean Rivers Coalition:** There is an effort underway to coordinate the communication efforts around water and water resource management in Oregon. The Clean Rivers Coalition is just getting started and has the potential to make it cheaper and easier for individual municipalities/utilities to deliver consistent, high quality messages to the public and decision makers.
- **Get to know your water resources manager counterpart:** ‘Floodplain managers, do you know who plans and operates your local stormwater management system?’ ‘Stormwater managers,

do you know the certified floodplain manager in your county'? Too often, the answer to these questions is 'no'. There is an opportunity for surface water manager to reach out to their counterpart and set up a time to meet them and understand their core responsibilities and actions. It's that simple to start a relationship that could yield improved coordination in planning and delivery of local resource management objectives.

- **Disseminate findings of the StormFlood workshop or report:** Workshop participants could send this report to a colleague and let them know some of the specific takeaways from reading the report, participating in an interview, or attending the workshop. Colleagues are considered a highly credible source of new information and speaking to coworkers or counterparts about this topic could be a more effective way to spread the message than other ways that they might hear about it (e.g., website, social media, via email).

Long Term

Additional actions that managers can take over the next year, or years ahead, include:

- **Culture:** Watersheds and hydrologic processes don't adhere to silos. So when an agency or department decides to take a watershed approach to understanding how best to act to affect change or restore processes in surface water, there is a natural tendency to look across departmental or regulatory silos. When municipalities/utilities take a watershed approach, it tends to become part of the organizational culture, further reinforcing the tendency to treat water as water and manage the components of surface water in an integrated manner.
- **Leadership:** Leaders with broad decision-making authority that are on board with the idea of integration and watershed-scale management can be incredibly powerful forces for change. So too can individual managers or planners who make a point to champion integrated approaches. Success stories, like the City of Salem's floodplain management plan or Eugene's wetland mitigation banking program, often come back to a passionate and dedicated staff member who pushed for trying something new.
- **Navigating politics:** Building support for a new approach can take multiple forms. Two important tactics that managers emphasized were 1) make the business case by bringing the effects of an integrated management approach back to how they affect people and the bottom line; and 2) start small and fly under the radar; demonstrating successes, even small ones, goes a long way to building political support.
- **Shared technical information:** Like a "dig once" approach for understanding watershed dynamics, wherever possible, seek technical information that can support decision making in multiple departments. A shared understanding of watershed drivers, pressures, and responses can lead to similar decisions about how to affect change or restore process within the watershed even in the absence of direct coordination.
- **Prioritize outreach and communication:** Asking public officials and the public to look beyond short term interests or to manage the community's resources in a new ways requires a high level of trust and understanding. Effective communication and outreach is a strategy for integration in itself.

- **Develop good policy:** Communities that identify integration of water resources management as a goal to benefit their citizens can develop policies to support that goal. Policies might include expanding the time horizon for planning efforts, requiring consultation with other municipal departments during planning, creating a local floodplain buyout or acquisition program that can improve storage of flood water during heavy rain events and reduce long term risk to people and properties in the floodplain. The League of Oregon Cities, Association of Oregon Counties, and organizations like ACWA may all have a role to play in promoting effective policies that help communities take these kinds of steps.

Conclusions

The need for a more comprehensive and integrated approach to how we manage our water resources has been evident for some time. Water resource managers likely expected, or perhaps hoped, that there would be a driver for that undertaking or a clear model of how to achieve it. What this project has helped to reveal, however, is that there is no silver bullet or single approach to integrated water resources management. Instead, a number of different strategies will need to be implemented by a number of different people in order to start bridging the divide between the silos of water management. Integration might look different in each community in Oregon but will likely be driven by some common goals – cleaner water, safer communities, and resilient ecosystems. We hope that the findings presented in this report are helpful in moving toward that common future.