Evaluating Best Practices from State Revolving Funds (SRFs) to Support Market- and Nature-Based Approaches for Flood Risk Reduction and Water Quality Improvement

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1. Objectives

Enacted in January 2021, the Safeguarding Tomorrow through Ongoing Risk Mitigation (STORM) Act authorized the Federal Emergency Management Agency (FEMA) to establish hazard mitigation revolving loan funds to provide needed and sustainable funding for hazard mitigation projects (see Appendix 2). The program will provide capitalization grants to state agencies responsible for emergency management to establish revolving loan funds for projects designed to reduce risks from disaster, natural hazards, and other related environmental harm in addition to other support through direct project grants and technical assistance. This program is modeled after the highly successful Clean Water and Drinking Water State Revolving Funds (CWSRF/DWSRF, or SRFs) administered by the Environmental Protection Agency (EPA) that fund water, wastewater, and stormwater projects. Congress has already approved appropriations of $100 million for federal fiscal years 2022 and 2023.

This report is offered to assist Environmental Defense Fund (EDF) in providing recommendations to FEMA about how this new loan program can be structured to encourage nature-based solutions. It identifies best practices among states that have created innovative financing opportunities through their SRF programs. This report is the product of a review of published research and focused interviews with SRF Directors, EPA staff, and experts in the field of environmental financing to gather firsthand accounts of their successes, the challenges they faced when attempting innovation, and barriers they encountered when implementing program priorities.

2. Introduction and Background

The STORM Act allows priority to be given to applications that:

- Propose increasing resilience and reducing risk of harm to natural and built infrastructure
- Involve a partnership between two or more eligible entities to carry out a project or similar projects
- Take into account regional impacts of hazards on river basins, river corridors, micro-watersheds, macro-watersheds, estuaries, lakes, bays, coastal regions, areas at risk of earthquakes, tsunamis, droughts, severe storms, and wildfires, including the wildland-urban interface, and
- Propose projects for the resilience of major economic sectors or critical national infrastructure, including ports, global commodity supply chain assets (located within an entity or within the jurisdiction of local governments, insular areas, and Indian tribal governments), power and water production and distribution centers, bridges, and waterways essential to interstate commerce

Capitalization grants can also be used to implement zoning and land use planning changes and to enforce building codes to protect a building's users against disasters and natural hazards.

STORM Act funding should seek to capitalize on the decades of lessons learned from the SRFs. The Safe Drinking Water Act (SDWA), which enabled the DWSRF, does not authorize loans for the acquisition of land or conservation easements for protection of source water, often required to implement nature-based solutions. For these reasons, this report focuses on CWSRF programs.

CWSRF programs fund a wide variety of water quality protection efforts. The program's flexibility and broad range of eligible projects enable states to target CWSRF funds to their specific water quality priorities. Since the program was authorized in 1987, innovative statutory and regulatory changes have fostered a diverse variety of eligible projects.

In 2014, the Water Resources Reform Development Act (WRRDA) was enacted, amending the CWSRF rules. Specifically, WRRDA extended loan repayment terms to 30 years from 20 years and expanded eligible project types to include watershed, nonpoint source, and water and energy efficiency projects.

Given that SRFs have accumulated more than three decades of experience in administering revolving loan funds, EDF is interested in understanding which elements of innovative SRF programs enable nature-based projects to move forward efficiently without real or perceived programmatic barriers. It is hoped that evaluating these special features of SRF programs will illustrate lessons learned that can be used to inform development rules and guidance for the FEMA STORM program.

3. Approach

The recommendations and summaries presented in this report were developed after:

- Targeted interviews with several national experts including state SRF administrators, EPA staff, and other environmental financing experts (Appendix 1),
- Extensive review of relevant literature (Appendix 3), and
- Selection of high-impact case studies that represent innovative uses of SRF to enable nature-based project solutions (Section 5).

4. Key Recommendations for FEMA STORM Program

We highlight six key recommendations below that illustrate hard-earned lessons learned from SRFs over time that can guide efficient and productive implementation of nature-based infrastructure projects under the STORM Act hazard mitigation revolving loan funds:

1. **Avoid federalization of the program:** There is a repeated, consistent sentiment among state SRF administrators and applicants that these programs work best when they allow maximum flexibility. To the extent possible, FEMA should consider reducing administratively

burdensome and inflexible project eligibility federal requirements. Each state will have its own priorities. To the degree that STORM can encourage state flexibility to better drive the 'right solutions at the right time for the right place' and minimize one size fits all solutions, the better. The STORM program should attempt to balance this state flexibility while also prioritizing nature-based and innovative solutions.

Recent years have seen an increase in SRF federal mandates including prescriptive procurement requirements, certifications, Davis Bacon fair wage requirements even if a state has its own prevailing wage, and the requirement to purchase American Iron and Steel products. This adds to project delays, cost overruns, and underutilization of funds. Particularly in a low interest rate environment, added costly requirements can make the utilization of a revolving fund less competitive than going directly to the bond market or to other, more facile sources of financing.

2. **Provide Support to Identify Repayment Streams:** A consistent challenge to a revolving loan fund for nonpoint source projects is identification of repayment mechanisms. The ability to quantify the outcomes of these projects to decision-makers presents opportunities to create new revenue streams for repayment, but states and municipalities need support in this area. It is recommended that FEMA identify opportunities for stacking grant sources, nutrient trading, carbon credits, or sustainable forestry income. The ability to structure a revolving loan fund to match these repayment sources is critical to success. We recommend that all entity types, including for-profit entities, be eligible for direct funding; requiring partnership with municipal applicants has been proven to lead to missed opportunities because of the resulting additional barriers of time and expense.

3. **Focus on Providing Environmental Finance Support:** SRF programs began as grant programs with heavy emphasis on engineered, grey infrastructure solutions. As the programs morphed into the revolving loan structure in the late 1980s, many states maintained this grey infrastructure focus for their programs. Many states continue to primarily provide only direct loans to municipalities for traditional projects, rather than nature-based solutions. While SRFs have a mission to invest in high quality clean water projects, they have capability to support eligible water projects with a variety of financial mechanisms that most environmental organizations do not have the expertise to provide. The most innovative and productive SRF programs are typically led by their state environmental finance authority. Conversely, those states with excess unutilized funds and those that do not leverage a variety of solutions tend to be managed by the state environmental regulatory entities. The focus on environmental finance tends to improve utilization and promote innovative, market-based projects.

4. **Collaborate with Other Federal Funding Sources:** While it may be unclear at present exactly which state entities will participate in the STORM program, there will be benefits to adapting principles from the existing SRF financial structure. Additionally, many STORM projects, including stormwater, water quality and floodplain restoration and reconnection, are also CWSRF eligible. If STORM could tap into the existing environmental finance expertise

of SRFs, it could allow for co-funding and leveraging of larger projects. There are also many other federal funding sources (e.g., United States Department of Agriculture (USDA), Economic Development Administration (EDA), Housing and Urban Development (HUD)) that can be creatively braided with STORM financing to create larger and more strategic and impactful projects. It should be noted that while these federal funds could be used to jointly fund their projects, they can not be counted toward match requirements. SRFs can use repayment funds—funds that have been loaned out and repaid—as match for any federal funding.

5. **Invest in Project Development:** Most SRF managers want to increase their funding to natural infrastructure, also known as nonpoint source projects. The term "natural infrastructure" refers to naturally occurring landscape features and/or nature-based solutions that promote, use, restore or emulate natural ecological processes.

   While natural infrastructure may provide multiple co-benefits and be more cost effective than traditional grey infrastructure, state program staff capacity is often insufficient to initiate project development. For this discussion, project development is the work required to identify a potential project bring groups together for collaboration and assist with identifying and developing reliable repayment streams and secure funding. Most SRF programs are designed to receive and evaluate "fully baked" applications. Non-profit organizations are often skilled at the work associated with their missions but may lack the public environmental finance acuity required to navigate the SRF application and loan award process. They may not be aware of the intricacies of the SRFs and may not consider it as a viable tool for these types of projects and resort back to the grants-only approach of conservation funding. Municipalities often lack capacity to pursue deeper understanding of how cost-effective natural infrastructure projects or watershed-based approaches can be. Consequently, they may turn to consulting engineers to offer engineered vs. nature-based solutions.

   The STORM program could benefit by studying this need and evaluating whether to offer compensation for entities to bridge gaps in understanding nature-based solutions and assist with project development prior to finalizing applications. Making project development funds available would be a small investment that could bring a strong return on investment by bringing more strategic, "fully baked" projects to the revolving fund or other sources of funding.

6. **Require Demonstration of Economic Co-Benefits of Natural Infrastructure:** There is a growing appreciation of the need to articulate economic co-benefits of nature-based projects. Quantifying upstream and downstream benefits and communicating anticipated savings to municipalities can increase investments, particularly if the benefit protects against downstream flooding of existing infrastructure.

   Typically, municipalities make project investments to maintain compliance with regulatory requirements or out of necessity (e.g., to address flooding) and they seek solutions only

within their municipal boundaries. The opportunity to demonstrate cost savings by upstream investment would result in projects that provide benefits to multiple communities within a watershed.

5. Case Studies: Programs and Innovations

Below are five case studies of some of the more innovative, market-based SRF financing deals and programs in the country that enabled nature-based solutions to move forward. These case studies were selected for their unique funding mechanisms and their ability to inform those who are currently shaping the STORM program with an eye towards enabling nature-based solutions. These case studies highlight effective use of the following innovative funding mechanisms:

- **Outcomes-Based Financing:** An SRF invests directly in an outcome rather than a project, with an anticipated return on investment instead of a loan repayment. This is discussed in the Soil & Water Outcomes Fund to follow.
- **Credit Enhancement:** An SRF uses its excellent credit score to guarantee the obligations of another entity, driving down project costs. This is discussed in the NYSERDA example to follow.
- **Nutrient Trading:** An SRF funds projects that allow municipalities to buy nutrient credits from nonpoint source projects instead of from traditional point source projects. This is discussed in the PENNVEST example to follow.
- **Sponsorship:** An SRF employs a buy one, get one free model that pairs traditional grey infrastructure projects with a nonpoint source project and reduces the interest rate so that the nonpoint source project is forgiven over the life of the loan, resulting in a “free” natural-infrastructure project. This is described in the Ohio SRF example to follow.
- **Sustainable Timber Harvesting & Carbon:** An SRF utilizes carbon credit revenues and sustainable timber harvesting as loan repayment sources for high quality nonpoint source projects. This is described in the California Yurok Tribe example to follow.

While not highlighted in the cases below, other innovative financing mechanisms through SRFs for nonpoint source projects include:

- **Linked Deposit:** Under this approach, an SRF program works with local private lending institutions to provide assistance for nonpoint source pollution controls. The state agrees to accept a reduced interest rate on the account in which the Fund is held (e.g., a certificate of deposit or savings account return), and the lending institution agrees to provide a loan to another borrower for pollution control at a similarly reduced rate. The lending institution receives the return on investment from the investment and are often paid an administrative fee for underwriting and maintaining loans. Linked deposit has been widely used in several states including Iowa, Ohio, Maine, and California. This allows private borrowers to access a low interest rate loan without having to navigate the state SRF program application processes, which requires allocation of in-house

administrative capacity. Additionally, because linked deposit is considered an investment, programmatic requirements such as American Iron and Steel or the Davis Bacon Act are not required.

- **Interim Financing Loans:** With interim or “bridge” loans, SRFs can offer fast access to capital when a desirable water quality project has been identified that requires land acquisition. Typically, it can take 2-4 years to identify and procure grants needed for a high-quality land conservation project. However, when properties become available, the time for action is often short and the property is at constant risk of being lost for conservation or restoration purposes. If a project is financed, it may do so via a traditional financial institution, requiring thousands per year in interest charges. Vermont’s Natural Infrastructure Interim Financing Program offers nonprofits a 5-year interest-only loan at a 0.6% annual rate that does not start accruing until one year after loan execution and disbursement. Principal isn’t repaid until the last year of the loan as a balloon payment. A balloon payment is a larger than usual one-time payment at the end of a loan. The goal is to provide the nonprofit with the maximum financing term to allow time to secure all grant sources with the least amount of out of pocket costs possible.
- **Co-Financing or Blended Financing:** Another powerful SRF tool is the ability to co-fund with other sources. Examples of co-financing are Maryland and Virginia SRF’s Farm Credit Banks. The SRF provides funds to a bank that farmers can use to access full project costs with upfront funds available in approximately three days. After the project is constructed, the farmer can be reimbursed by a USDA grant, which is then used to repay the SRF loan. Other states use this mechanism to co-fund with USDA and/or HUD’s Community Development Block Grants (CDBG).
- **Programmatic Financing:** Programmatic Financing, also known as “ProFi”, shifts the traditional project-specific lending strategy to one that is more congruent with using bonds to finance an annual (or multi-year) cash flow for capital improvement projects. Instead of issuing a binding commitment for a certain amount of SRF dollars to a single project, a programmatic financing loan is designed to fund the utility’s entire capital improvement plan (CIP), or any portion thereof, so long as the projects are eligible and prepared in compliance with SRF program requirements. This also encompasses nature-based projects that are included as part of the CIP. ProFi ensures consistent utilization of the program, reduced administration for the applicant, and greater flexibility to receive disbursement based on priorities that may change over a year. The Rhode Island and Hawaii SRFs have been using ProFi as a tool for several years.

Case #1: Iowa SRF and the Soil & Water Outcomes Fund

Project Description

The Soil & Water Outcomes Fund uses private capital to provide upfront financial incentive payments to farmers who implement new on-farm conservation practices that generate verifiable environmental outcomes like carbon sequestration and water quality improvements. The Fund monetizes these environmental outcomes by profitably selling them to public and

private buyers that derive value from them for regulatory compliance or voluntary sustainability reporting.

Launched in 2020, the Fund was created and is jointly managed by ReHarvest Partners (a subsidiary of Quantified Ventures) and AgOutcomes (a subsidiary of the Iowa Soybean Association). Grant funding from foundations and private companies provided the upfront funding needed to develop the program. The Fund was seeded by a $7.5M investment from the Iowa SRF and the Iowa Finance Authority. ReHarvest Partners is responsible for all financial and contractual aspects of the soil and water outcomes fund. These responsibilities include financial structuring, capital raising, finance and accounting, and entering into agreements with participating farmers and outcomes customers. AgOutcomes is responsible for all of the agronomic and farmer-facing aspects of the SWOF program. Outcomes are not measured directly by ReHarvest or AgOutcomes. They are measured using a combination of 3rd party biogeochemical process models, as well as in-field soil and water quality sampling data. Outcome quantification is supported by Sustainable Environmental Consultants.

The Fund enables its customers to pay for environmental outcomes after they have been produced and verified, a demonstrably more cost-effective means of achieving environmental improvements than existing ‘pay for practices’ approaches. By quantifying and monetizing the multiple environmental outcomes (i.e., carbon sequestration and nitrogen and phosphorus reduction), and by aligning diverse public and private entities looking to achieve these outcomes in the same transaction, the Fund can offer participating farmers payments that are competitive with other existing public cost-share or private ecosystem service market programs. The funds generated by the sale of environmental outcomes create a secured and reliable revenue stream that can be used by the Fund to repay return-seeking investment capital, including SRF investment. The SWOF is not prescriptive about the practices implemented by farmers. Farmers may propose a single practice or mix of practices that may work for their operation. Most participating farmers implement a mix of in-field management practices that at least include cover crops and some form of conservation tillage.

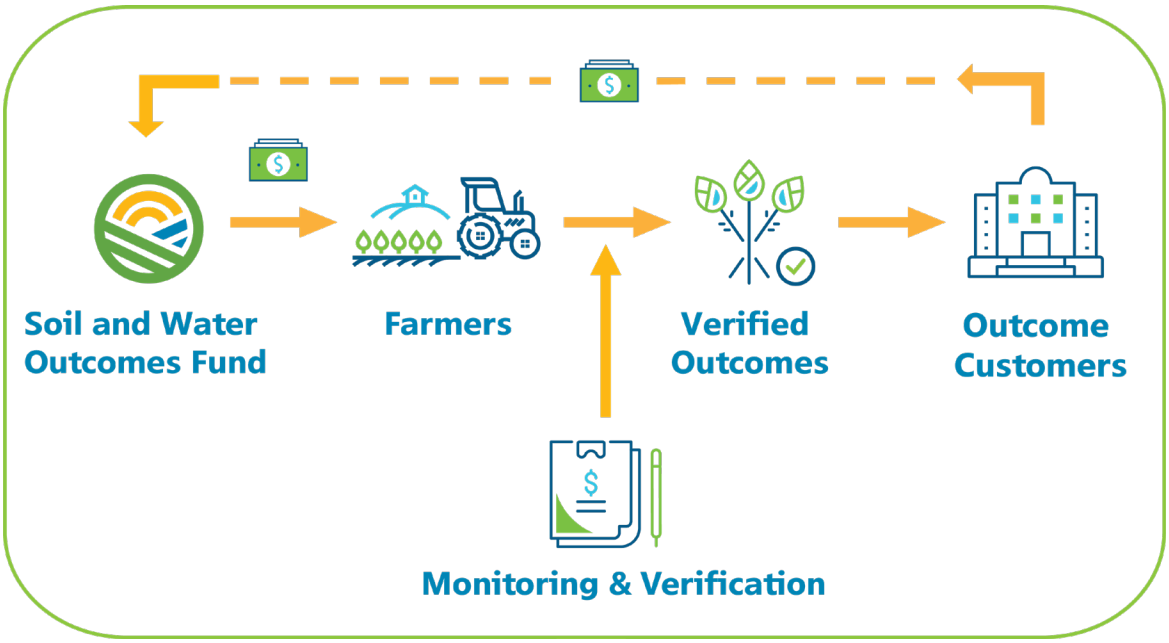

Figure 1: Soil & Water Outcomes Fund Mechanism[1]

Funding Mechanism

Iowa's SRF was able to provide financing for the Soil and Water Outcomes Fund using an investment mechanism other than a traditional SRF loan. The Iowa Finance Authority (IFA), which administers the Iowa SRF in partnership with the Iowa Department of Natural Resources (IDNR) invested $7.5M into ReHarvest. Profit from generated credits is used to repay IFA with interest. IFA's approach to fund this project as an investment gave it increased flexibility on repayment structuring. This also allowed IFA to fund this project outside of the traditional project solicitation window.

Enabling Legislation

At the federal level, this type of investment financing takes advantage of the provision in the CWA that authorizes SRF funds "to earn interest on fund accounts" (Title 33 Subchapter VI §1383(d)(6)).

At the state level, many SRFs only allow for traditional Section 212 funding and often only provide direct lending to municipalities. In 2002, Iowa's SRF program was underutilized while their water quality challenges mounted. As an agricultural state with an estimated 75% of water quality pollution from nonpoint sources, combined with scarce grant sources, changes to allow for expansion to the SRF were considered necessary.

After working with stakeholders, the state of Iowa promulgated regulations that enabled its CWSRF to lend to private borrowers for nonpoint source projects. After these regulations were

[1] Soil and Water Outcomes Fund, 2021. Retrieved from https://www.theoutcomesfund.com/

promulgated, Iowa SRF created linked deposit programs for four Section 319 state priority areas: on-site wastewater, local water protection, stormwater, and livestock water quality facilities. Since then, Iowa has created linked deposit arrangements with over 400 funding institutions. Section 319 of the Clean Water Act authorizes funding of each state's nonpoint source management plan, which typically funds nature-based projects outside of SRFs. However, nearly anything described in a state's 319 Management Program is also CWSRF-eligible.

Outcomes

In 2020 (the first year of implementation), the Fund provided payments averaging $37 per acre to farmers implementing new conservation practices across 9,500 acres of cropland. These conservation practices generated an average of 18 pounds of nitrogen reduction and 1.5 pounds of phosphorus reduction per acre, as well as 0.75 tons of carbon sequestration. The nitrogen and phosphorus outcome credits were sold to the cities of Cedar Rapids and Ames, Iowa to be applied or banked for future use against National Pollutant Discharge Elimination System (NPDES) permits using the Iowa Nutrient Reduction Exchange. Cedar Rapids and Ames purchased these nonpoint source nutrient reductions because they were a more cost-effective option for addressing nutrient loading on a per-pound basis than technology-based alternatives at their municipal wastewater treatment plants. The success of their participation as outcome customers of the Soil and Water Outcomes Fund led to follow-on commitments from these municipalities to purchase credits from the Fund in 2021 and 2022.

The Fund is currently in the process of scaling up to a target enrollment of 100,000 acres of cropland across Iowa, Ohio, and Illinois in 2021. In addition to increasing the number of acres enrolled, ReHarvest Partners also added several new public and private outcomes customers. For example, the Iowa Department of Agriculture and Land Stewardship (IDALS) committed to purchase verified nitrogen and phosphorus reductions from the Fund using its Iowa Water Quality Initiative Funding. The purchase of verified outcomes by IDALS marks a significant evolution in the way the state is distributing its conservation funding and the methods it uses to improve water quality, which had largely focused on 'pay for practices' approaches rather than 'pay for outcomes' approaches. As part of securing this outcome purchase commitment, the Fund was able to demonstrate to IDALS that the purchase of a verified outcome was approximately 33% more cost-effective then their existing practice-based approach. Additionally, the United States Department of Agriculture (USDA) has agreed to purchase outcomes of the fund as it was demonstrated that these outcomes are more cost-effective ways of dealing with agricultural water challenges.

Relevance to STORM Act

There are four key areas in which the proposed STORM Act could benefit from the innovative partnership between Iowa CWSRF and the Soil & Water Outcomes Fund:

1. **Innovative Repayment Stream:** The primary challenge in creating a loan program for nonpoint source projects is identifying a repayment stream. Without user fees or regulatory mandates, these projects frequently remain underinvested. The Fund's creative strategy to

monetize and create new revenue streams from both carbon credits and nutrient reduction credits under the Iowa Nutrient Reduction Exchange framework is a market-based solution. The FEMA STORM program should create mechanisms to identify innovative repayment stream and monetize risk reduction. projects.

2. **Public/Private Partnership (P3):** Another unique characteristic of this project is that it brings together a group of public and private entities that derive complimentary value from participating in the same transaction, but which typically do not have occasion to interact in the normal course of their operations. The Fund's managing entities represent an impact-focused investment entity (ReHarvest Partners, a subsidiary of Quantified Ventures), a state-level agriculture commodity association (AgOutcomes, a subsidiary of the Iowa Soybean Association) and the Iowa SRF (public financing authority). It also creatively aligns private companies looking for carbon sequestration outcomes for Scope 3 Greenhouse Gas (GHG) reporting (e.g., Cargill, Nutrien Ag Solutions, PepsiCo) and a diverse set of public entities looking to achieve regulatory and voluntary water quality improvements (municipal wastewater utilities, county governments, state departments, and the USDA) in the same transaction structure. Scope 3 GHG reporting allows companies to assess their entire value chain emissions impact and identify where to focus reduction activities. ReHarvest Partners had engaged with the Iowa Finance Authority since early in the development phase of the Soil and Water Outcomes Fund. These discussions started nearly 3 years ago. The program structure evolved significantly over the intervening period, up to the point at which Quantified Ventures decided to create a wholly-owned subsidiary (ReHarvest Partners) to co-manage the Fund. ReHarvest worked directly with IFA and the SRF program managers to design and secure an appropriate debt facility that met the requirements and objectives of the SRF program, which led to a subsequent investment in ReHarvest Partners. In theory, this could be replicated, yes. Coordinating and stacking funding and project management with similarly mission-aligned organizations increases investment and focus on these projects. FEMA STORM should prioritize public private partnerships to encourage project development.
3. **Externalization of loan process:** Many states continue to suffer from lack of staff resources and visibility to smaller scale or distributed nonpoint source conservation opportunities that may improve water quality. Often adding an additional funding program or new regulatory requirement is viewed internally as placing a burden on current staffing resources. This particular investment mechanism allows state environmental departments and agencies to approve the project concept and allows a private company (ReHarvest in this example) to implement the work, dramatically increasing the state's investment in and commitment to nonpoint projects that improve water quality. FEMA STORM program should seek to minimize burden on state staff by capitalizing on capable for or non-profit support.
4. **Consideration of eligibility language:** SRFs can support nutrient credit trading in a number of ways including financing the credit-generating projects, developing watershed-based plans (including nutrient trading plans), and promoting flexible rates and repayment terms. However, the direct purchase and resale of credits is not an SRF-eligible project. Therefore, entities wishing to participate in nutrient credit trading must work directly with a municipality to identify credit-generating projects. This results in an inefficient trading system with a less reliable market. Relaxation of the ability to purchase can create a new opportunity of a NTC "broker". This broker can help FEMA staff support projects that

generate credits to sell to entities needing to purchase them. FEMA STORM could be used to finance either side of this equation—the projects generating the credits (the FEMA projects), the broker's purchase and re-sell, or the entity wishing to purchase the credits. A recommendation for the STORM Act is to expressly authorize the buying and reselling of credits in order to create a market to support these resilience projects.

Case #2: New York SRF and NYSERDA Energy Credit Enhancement

Project Description

The New York State Energy Research & Development Authority (NYSERDA) has an energy efficiency loan program in which loans are made to utility customers to cut energy consumption by repairing or improving their property, adding insulation, repairing weather sealing, or replacing an air conditioner with a high efficiency model. NYSERDA makes energy efficiency loans using a revolving loan fund. Money goes to the customer (or to the customer's contractor) from a large fund. Borrowers' monthly loan payments then replenish the fund over many years. The total volume of loans that can be made from the fund is limited by the pace of repayments.

NYSERDA benefits by selling these loans in the secondary market, immediately recovering the entire loan balance, and uses the recovered funds to make new loans right away. This enables much greater loan volume from the same fund. Selling loans has been a longstanding goal for many efficiency programs, but the challenge has been finding investors interested in buying and holding loans of this kind at a price that works. Investors have not exhibited an appetite for home improvement loans or small commercial loans with credit risks, low loan balances, and other uncertainties.

NYSERDA partnered with the New York Environmental Facilities Corporation (NYEFC) to use the state's SRF for credit enhancement for the efficiency loan sales. The State of New York essentially promised investors that if NYSERDA was not able to fulfill any of its promises regarding the efficiency loans, SRF funds would be available to honor NYSERDA's commitments. These guarantees benefit NYSERDA in the form of a lower cost of borrowing on the loans. As a result, NYSERDA can make more efficiency loans at a lower price to customers for efficiency improvements.

The guarantee is secured by SRF recipient payments and a pledge of available SRF program equity. NYSERDA was also required to capitalize a collateral reserve account that is held separate by NYEFC and is not part of the bondholder guarantee pledge. This allows NYSERDA to obtain a AAA credit rating for the energy efficiency loan portfolio.

Funding Mechanism

Funding assistance provided by this program is eligible under section 603(d)(3) of the CWA, which allows SRFs "to guarantee, or purchase insurance for, local obligations where such action

would improve credit market access or reduce interest rates." In 2016, the credit rating agency Fitch announced that approximately 82% of SRFs in the Fitch-rated portfolio are rated AAA. The use of the SRFs as credit enhancement has not been used widely. Prior to the NYSERDA example, only one other project in Arizona received a state SRF guarantee in 2000. However, Pennsylvania's Infrastructure Investment Authority (PENNVEST), which administers Pennsylvania's SRF, recently introduced its Credit Enhancement Assistance program because the annual demand for funding exceeded PENNSVEST's lending capacity.

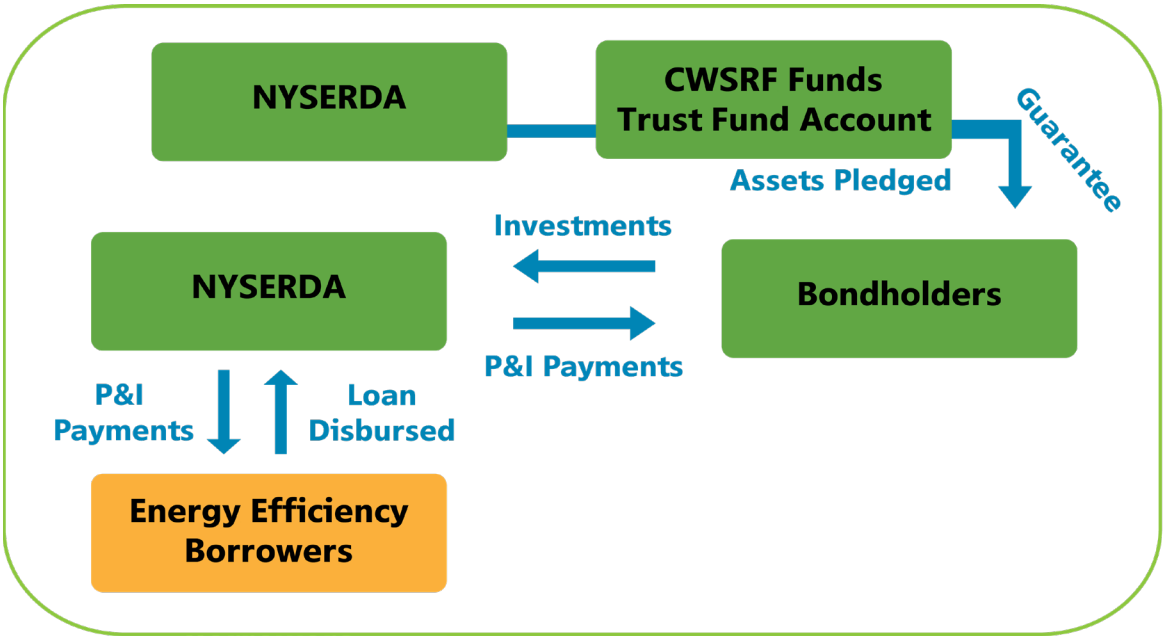

Figure 2: NYSERDA and NYSEFC Credit Guarantee Mechanism

Enabling Legislation

NYEFC consulted with EPA to ensure that the guarantee would be an eligible use of CWSRF funds. The project type eligibility analysis required demonstration that use of the funds would meet the requirements of Section 603(c)(2) of the CWA which allows funding for projects that meet the definition of a state's 319 program. Before the partnership proceeded, New York State's Section 319 nonpoint source management program had already identified atmospheric deposition, the particulate matter from burning fossil fuels to generate heat and electricity, as a significant source of water quality impairment. EPA concurred with NYEFC's assessment that energy efficiency projects to reduce atmospheric deposition was an eligible use of CWSRF funds.[2]

[2] Financing Options for Nontraditional CWSRF Eligibilities, EPA, May 2017. https://www.epa.gov/sites/production/files/2017-05/documents/financing_options_for_nontraditional_eligibilities_final.pdf

Outcomes

The guarantees provided by New York's SRF secured a AAA rating for a $24 million NYSERDA bond offering with terms and pricing identical to traditional CWSRF transactions in the capital markets.

Relevance to STORM Act

The use of a revolving fund as a loan guarantee has two potential considerations for future STORM Act funding:

1. **Creative Partnerships:** STORM hazard mitigation revolving loan funds should encourage connections between funding and desired outcomes through fostering new partnerships. Often, these partnerships may not be immediately obvious. For example, there may not appear to be an immediate connection between energy efficiency and clean water, and in many states, these efforts typically operate in separate spaces with little crossover. However, after this link was outlined in New York and EPA concurred, the state was able to leverage larger and cheaper investments in both programs. FEMA STORM could look for similar connections between risk reduction and ecosystem benefits.
2. **Seek to Leverage Existing Funds:** One important consideration in the use of credit enhancements is that it does not require additional funds. This has the potential to create a multiplier effect that can lead to larger investments in projects that can be completed sooner. The FEMA STORM program can use the ability to serve as a credit backer to have a greater reach in pre-disaster mitigation.

Case #3: Pennsylvania SRF and Nutrient Credit Trading Bank

Project Description

Starting in 2004, the Pennsylvania Infrastructure Investment Authority (PENNVEST), the lead state agency for SRF Pennsylvania, worked in conjunction with the Department of Environmental Protection (DEP), which operates a clearinghouse for nutrient credit trading in the Chesapeake Bay watershed. For all credit-generating projects funded by the SRF, PENNVEST owned credits up to the value of the SRF subsidy.

PENNVEST hosts auctions for the sale and purchase of nutrient credits in the Susquehanna and Potomac watersheds. PENNVEST's Nutrient Credit Trading (NCT) program provides a cost-effective means for regulated public and private wastewater treatment plants and other parties to purchase credits to meet their nitrogen and phosphorus discharge limits for the compliance year. PENNVEST serves as central counterparty and clearinghouse for auction transactions; nutrient credit buyers and sellers contract with PENNVEST. This arrangement reduces risk for buyers and sellers, which in turn helps stabilize the NCT market in Pennsylvania.

Eligible participants in the NCT Program include municipal and industrial wastewater treatment plants (WWTPs), nonpoint sources, and third-party aggregators. Trades can be made between municipal and industrial WWTPs, between a municipal or industrial WWTP and a nonpoint source, or between a municipal or industrial WWTP and an aggregator. Currently, agricultural operations are only eligible to act as credit generators, but municipal and industrial WWTPs can act as credit generators or credit purchasers. To be eligible to trade as a credit generator, an agricultural operation must first meet baseline and threshold requirements. After adjusting for location, nutrient reductions minus a credit reserve can be used to generate the nutrient credits that are made available for sale. To be eligible to use credits or offsets for compliance purposes, a municipal or industrial WWTP must have authorizing language in its NPDES permit that allows the use, and sale of credits and the application of offsets.

Funding Mechanism

The funding mechanism for PENNVEST's nutrient trading program works like a direct loan to a typical SRF borrower. However, apart from entities that directly participate in the trading auction, PENNVEST also plans to hold a separate and additional reserve of credits that will be generated by PENNVEST-funded projects. This credit reserve will be created from credits generated by projects funded by the SRF. Entities looking to purchase credits contract directly with PENNVEST rather than an individual credit seller. To participate in PENNVEST credit auctions, a buyer must be pre-approved to purchase credits. Depending on the auction, credit sellers must come to PENNVEST with their credits already certified or verified by the Pennsylvania Department of Environmental Protection. PENNVEST does not certify or verify pollutant reduction activities, or handle the certification or verification process for sellers, but the innovation here is that PENNVEST has created a clearing house of credits to use on high priority projects.

Enabling Legislation

The creation of a nutrient trading platform required significant collaboration among state regulatory environmental entities and financial authorities. The process varies greatly by state.

In 2010, the State of Pennsylvania passed a number of statutory changes to support NCT, including:

- Section 96.8(b)(1) codified its trading and offsets program authorizes credits and offsets to be used to meet the legal requirements for restoration, protection, and maintenance of the water quality of the Chesapeake Bay.
- Section 96.8(b)(3) allows credits and offsets to be used by municipal and industrial WWTPs for both new or increased sources and existing sources, to meet effluent limits for nitrogen, phosphorus, and sediment expressed as annual loads in pounds contained in NPDES permits that are based on compliance with water quality standards established under the CWA for restoration, protection, and maintenance of the water quality of the Chesapeake Bay.
- Section 96.8(b)(6) states that credits and offsets may not be used to comply with technology-based effluent limits, except as expressly authorized under federal regulations administered by the EPA.

Outcomes

PENNVEST provided a $7.8 million loan for the construction of a manure management system on a dairy and egg farm in Lancaster County. The loan will be repaid entirely by nutrient credit sales. As compensation for its risk, PENNVEST will also share in nutrient credit sales in excess of the amount needed to repay the loan. It should be noted that the number of facilities completing NCTs has declined in recent years because many discharge permit holders are in compliance with current regulatory requirements. Trades still occur, but the SRF is not currently generating enough revenue to participate in auctions. It is anticipated the NCT market will increase as future regulatory requirements are implemented.

Relevance to STORM Act

1. **Creative Repayment Stream**: This is another example of a creative repayment stream for nonpoint source loans. Many pre-hazard mitigation projects have the potential to be nutrient credit generating project types. This has the potential to co-fund with any STORM financing to leverage larger projects and create a sustainable repayment stream for a revolving loan fund. The FEMA STORM program should seek to monetize risk to provide repayment streams for their loans.

Case #4: Ohio SRF and Water Resource Restoration Sponsorship Program

Project Description

Beginning in 1994, the Ohio EPA originated the concept of sponsorship lending with its Water Resource Restoration Sponsor Program (WRRSP). The WRRSP offers communities very low interest rates on loans for wastewater treatment plant improvements if the communities also sponsor projects that protect or restore water resources. A community that participates in the WRRSP does not typically implement a restoration project itself. Instead, it enters into a sponsorship agreement with an implementing partner - such as a land trust or a park district - that develops and implements the project, while the sponsoring community repays the loan. The WRRSP has supported projects that have acquired wetlands and riparian lands, conservation easements, restored habitat, and modified dams. Ohio’s WRRSP reinforces the idea that wastewater treatment plant improvements and water resource restoration projects are complementary efforts.

Funding Mechanism

Sponsorship lending pairs a traditional publicly-owned treatment works (POTW) project with a non-traditional one, usually a nonpoint source project. A municipality receives a loan with a reduced interest rate as compensation for also undertaking (i.e., sponsoring) a non-traditional project, thus allowing municipalities to address pressing watershed restoration or protection priorities without placing a repayment responsibility on nonpoint source projects. This arrangement works best when the cost of the combined project is equal to or less than the cost of a stand-alone POTW project when financed at normal SRF interest rates. For example, a

$1,000,000 loan at 3.8% interest would result in a total repayment of $1,436,707 over a 20-year term. A $1,393,442 loan at 0.3% interest results in the same repayment amount. A municipality could therefore borrow $1,000,000 for a traditional POTW project plus $393,442 to implement NPS projects at no greater overall cost. For added incentive, an SRF could further reduce the interest rate so that the municipality would save money rather than break even. [3]

In 2013, the Northeast Ohio Regional Sewer District (NEORSD) partnered with the Western Reserve Land Conservancy and the Medina County Park District to acquire the 87-acre Medina Marsh. NEORSD was the sponsoring entity and received a 0.06% discount on its standard, below-market interest rate to finance four nonpoint source projects, including the purchase of Medina Marsh. Through the sponsorship agreement, NEORSD saved $432,900 in reduced interest payments on its loan by sponsoring this and other WRRSP projects. The purchase was funded with a $963,702 Clean Ohio grant from the Clean Ohio Fund, a $75,000 U.S. Fish and Wildlife Service grant, and $257,100 of WRRSP funding. The property provides protection for 1,450 linear feet of floodplain and forested buffer along the West Branch of the Rocky River, approximately 5,366 linear feet of its tributaries, 32 acres of high-quality wetlands, and a variety of habitats, including a heron rookery. The acquisition links a green corridor that is two miles long and covers more than 360 acres.

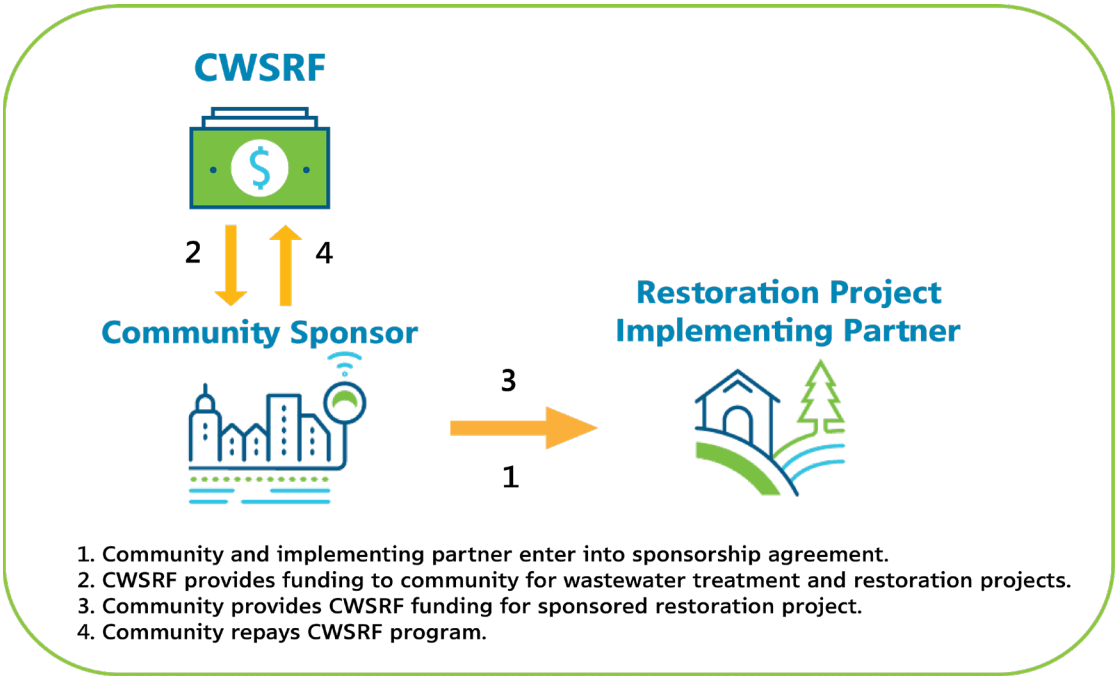

Figure 3: Ohio WRRSP Funding Mechanism

[3] Sponsorship Lending and the Clean Water State Revolving Fund, EPA, October 2017. https://www.epa.gov/sites/production/files/2017-10/documents/sponsorship_style_newest_final.pdf

Enabling Legislation

The ability to create a sponsorship program that funds both point and nonpoint source projects has been authorized since the 1987 CWA Amendments. However, many states would need to enact a state statute that authorizes a sponsorship program. For example, Iowa and Vermont successfully made changes to their statutes to remove barriers for sponsorship including use of user fees as a repayment source for a non-utility use, project type, applicant access to CWSRF, and statutory voter authorization requirements. SRFs choose to support sponsorship to increase investment in nature-based projects by connecting them to projects with a user base. Each state's sponsorship program has a unique set of eligibility criteria based on state priorities. Ohio's sponsored projects must result in complete protection or restoration of an aquatic resource. Iowa's sponsorship program focuses primarily on green stormwater infrastructure. What all sponsorship programs have in common is that the sponsored project is a nonpoint source project without rate payers to support the project.

Outcomes

Ohio EPA established the WRRSP in 2000. Since that time, it has provided $195 million for sponsorship projects. Water resource protection accomplishments include preservation of more than 5,200 acres of wetlands and 90 miles of streams. As of 2021, the program continues to provide $15 million annually, divided between protection and restoration projects.

Relevance to STORM Act

This case study offers two relevant insights for STORM:

1. **Point Source Projects as Funding for Nonpoint Source Projects:** Many pre-disaster mitigation projects will not have an obvious funding stream, or sources of revenue for repayment. If a given state either has an existing sponsorship program or chooses to adopt one in the future, it could serve as a funding source for the STORM project.
2. **Leveraging Existing CWSRF Program:** Another exciting opportunity of partnering with a state's sponsorship program is that it could provide a nexus between CWSRFs and the STORM program. If a wastewater treatment facility could sponsor floodplain reconnection, then it could not only join financing efforts, but also build upon programmatic and administrative policy and procedure already in place while achieving multiple benefits.

Case #5: California's Yurok Tribe Land Conservation

Project Description

In 2011, the Yurok Tribe received an $18.8 million, zero-interest SRF loan from the California State Water Resources Control Board (CSWRCB) with a 25-year repayment period to purchase 22,237 acres of forest land along the Lower Klamath River, consistent with the Board's *Plan for California's Nonpoint Source Pollution Control Program.* The purpose of the project was to enable the Tribe to manage the acquired forest land in a sustainable manner, including no pesticide application, increased stream buffering, longer timber harvest rotations, no clear

cutting, road decommissioning, and carbon reserves set-asides. The Tribe had long sought the return of ancestral land to create a salmon sanctuary and restore tribal cultural practices including subsistence fishing, hunting, and gathering.

The Tribe pledged both timber harvest revenues and carbon credit revenues for repayment of the SRF loan. The initial plan had been to use revenues from timber harvest as repayment, but once it was determined that those revenues would not be available while the Tribe developed and implemented its Forest Management Plan, carbon offset revenues filled that gap. The Tribe entered a five-year purchase agreement with CE2 California I LCC to sell carbon offsets. Revenues from the sale of carbon credits under the Climate Action Reserve Forest Project Protocol were used for the first several years of repayment.

The Yurok Tribe acquired the acreage and, as a condition of the CWSRF loan, developed a set of documents that included implementation measures to correct and prevent the deterioration of the watershed due to timber harvest practices within the acquired property. The Tribe completed a Forest Management Plan, a Nonpoint Source Program Plan, and a Final Project Assessment and Evaluation Plan that will be used as guidelines for implementing the project over 20 years.

Funding Mechanism

This project was funded by a direct loan to the Tribe with an innovative repayment mechanism. The Yurok Tribe's use of carbon sales and income from sustainable timber harvest helped to secure this loan. Additionally, the Tribe received the SRF benefit of a long-term loan at a fixed, low interest rate.

Enabling Legislation

This type of SRF investment is eligible under CWSRF eligibilities. These types of investments were a key driver that led to the later passage of Assembly Bill 2480 in 2016. As the state entered its sixth year of drought, this law declared that "source watersheds are recognized and defined as integral components of California's water infrastructure." It emphasized that conservation and restoration are critical pieces of infrastructure, on par with grey infrastructure. This allowed California's CWSRF to greatly increase investments in natural infrastructure.

Outcomes

The project restored tribal use of this land for a low-income community. Additionally, this project protected cultural resources, endangered species habitat, and re-established prime fishing waters.

Relevance to STORM Act

1. **Creative Repayment Stream:** The use of carbon and timber sales for conservation purposes is another example of market-based solutions and creative revenue streams to repay financing for natural infrastructure. The FEMA STORM program may consider using similar opportunities for the pre-disaster mitigation projects.

Appendix 1: Interviewee List

1. Brent Fewell, Earth and Water Law
2. Chris Meister, Illinois Finance Authority
3. Craig Holland, The Nature Conservancy
4. Cynthia Koehler, WaterNow Alliance
5. Dan Carlos, Milken Institute
6. Eric Rothstein, Galardi Rothstein Group
7. George Kelly, Bespoke Mitigation Partners
8. James McGoff, Indiana Finance Authority, Indianapolis, IN
9. Jeffrey R. Diehl, Rhode Island Infrastructure Bank
10. Kelly Tucker, US EPA
11. Lori Beary, Iowa Finance Authority
12. Michael Curley, Environmental Law Institute
13. Michael Dean, US EPA
14. Nathan Ohle, Rural Community Assistance Partnership
15. Rachel Halfaker, Milken Institute
16. Robert Boos, Pennvest SRF
17. Steve Malone, Ohio EPA
18. Susan Bodine, Earth and Water Law
19. Tim Male, EPIC
20. Jim Gephardt, EPA Water Infrastructure and Resiliency Finance Center

Appendix 2: STORM Act Legislation

Full text of STORM Act can be found here.

Appendix 3: Reference Materials

- Overview of Clean Water State Revolving Fund Eligibilities, May 2016. https://www.epa.gov/cwsrf/overview-clean-water-state-revolving-fund-eligibilities
- SRF Fund Management Handbook. https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=200041A2.txt
- Interpretive Guidance for Certain Amendments in the Water Resources Reform and Development Act to Titles I, II, V and VI of the Federal Water Pollution Control Act, January 2015.https://www.epa.gov/sites/production/files/2015-04/documents/water_resources_reform_and_development_act_guidance.pdf
- Clean Water State Revolving Fund. “Innovative use of Clean Water State Revolving Funds for Nonpoint Source Pollution” located at https://www3.epa.gov/npdes/pubs/linkeddepositfinalprint.pdf
- “State Revolving Loan Fund Support of Energy Efficiency and Renewable Energy Projects: Exploring Opportunities and Innovations.” Workshop summary of the Final NMC EPA Region 4 CWSRF Workshop Meeting. February 9, 2016 available at. https://static1.squarespace.com/static/5755d0321bbee0bbf4135d2f/t/5788e6c5e4fcb5f7c5b938fe/1468589767117/NMC+Final+EPA+Meeting+Summary_16-04-01.pdf
- Pennsylvania's Trading and Offset Programs Review Observations Final report 2-17-12. Available at Pennsylvania's Trading and Offset Programs Review Observations (epa.gov)
- “Iowa ReHarvest: Cultivating Returns from Regenerative Agriculture” by ReHarvest Partners located at https://www.reharvestpartners.com/
- Ohio Water Resource Restoration Sponsor Program (WRRSP) Progress Report, January 2019. https://epa.ohio.gov/Portals/29/documents/ofa/WRRSPProgressReport_1-14-19.pdf
- Yurok Tribe Land Acquisitions along the Lower Klamath River, California. https://www.waterboards.ca.gov/board_info/minutes/2010/dec/121410_6_yuroktribepres.pdf