

Cost Resources for Municipal Stormwater Programs

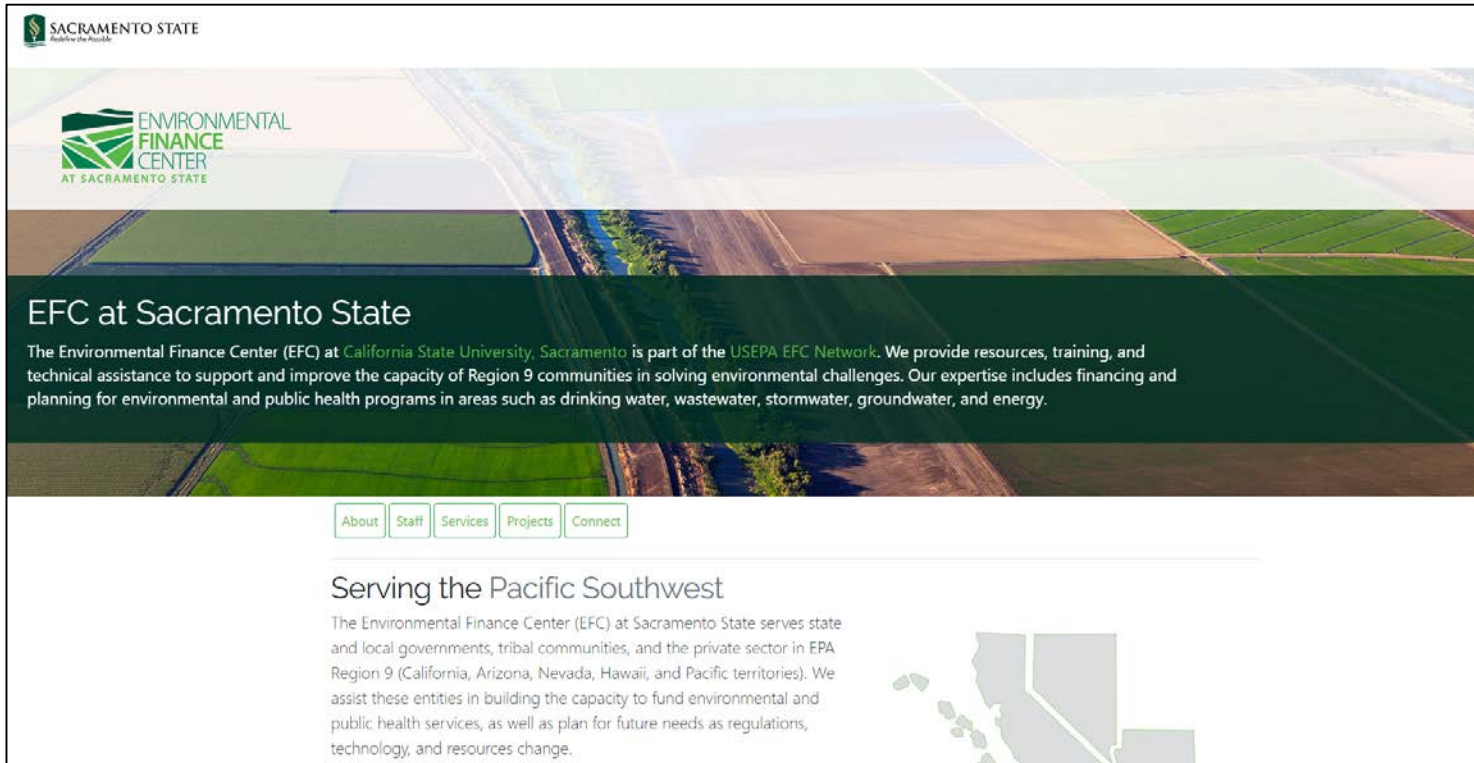
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*EPA Region 9 Environmental Finance Center (EFC)
Office of Water Programs (OWP) at Sacramento State*

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OWP and the EPA Region 9 EFC

- Expertise and tools for environmental finance



SACRAMENTO STATE
Redefine the Possible

ENVIRONMENTAL FINANCE CENTER
AT SACRAMENTO STATE


EFC at Sacramento State

The Environmental Finance Center (EFC) at [California State University, Sacramento](#) is part of the [USEPA EFC Network](#). We provide resources, training, and technical assistance to support and improve the capacity of Region 9 communities in solving environmental challenges. Our expertise includes financing and planning for environmental and public health programs in areas such as drinking water, wastewater, stormwater, groundwater, and energy.

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Serving the Pacific Southwest

The Environmental Finance Center (EFC) at Sacramento State serves state and local governments, tribal communities, and the private sector in EPA Region 9 (California, Arizona, Nevada, Hawaii, and Pacific territories). We assist these entities in building the capacity to fund environmental and public health services, as well as plan for future needs as regulations, technology, and resources change.



Stormwater Asset Management and Funding

- Identified need in the U.S., EPA Region 9, & California
- Expertise and funding constraints
- Goal: Provide technical assistance & reduce “barriers to entry”



Stormwater Asset Management and Funding

Costs

Revenues

Collect data on stormwater system assets

Asset Inventory Workbook

Identify desired maintenance regime

Level of Service: Existing System

Permit Compliance Costs

Future Buildout Cost Estimates

Compile costs together

Total Costs Workbook

Land Use Characteristics



Average Water Costs



Household Characteristics

Rate Structure Analysis Workbook

Utility Finance Structure and Funding Gap

A Storyboard with Local & National Resources



1. Develop an Asset Inventory

The asset inventory is a record of the components in your system, including their condition and the risk and consequences of failure. These records can be collected and stored using paper files, simple spreadsheets, or more specialized software. Information may come from many sources, including as-built drawings, maintenance records and contracts, GIS databases, and city parcel and tax assessor data.

Resources

- [Region 9 EFC Asset Inventory Workbook](#)
- [Region 9 EFC Stormwater Asset Management and Funding Guide \(Coming Soon\)](#)
- [Grand Rapids, MI, Stormwater Asset Management Report](#)
- [San Diego Asset Management Case Study](#)
- [EPA Asset Management Planning for Stormwater and Wastewater Systems \(2017\)](#)

The Steps

- 1 **Develop an Asset Inventory**
- 2 **Define Levels of Service**
- 3 **Estimate costs**
- 4 **Solicit input and listen**
- 5 **Financial capability analysis**
- 6 **Identify funding options**
- 7 **Determine funding gaps**
- 8 **Public outreach**

An Open-Source Toolkit

The Asset Inventory Worksheet displays a detailed list of assets. Key columns include:

- Asset Category:** Includes categories like 'Stormwater' and 'Water Distribution'.
- Asset Type:** Lists specific types such as 'Stormwater Pipe' and 'Water Main'.
- Material:** Specifies materials like 'PVC' and 'Cast Iron'.
- Length:** Measured in feet.
- Address:** Lists street addresses.
- Effective Date:** Indicates when the asset was installed or became effective.
- Financial Metrics:** Columns for Annual Appr, Estimated Effective Date, Present Value, and Replacement Value.

Asset Inventory Worksheet

The Level-of-Service Worksheet is divided into two main sections:

- Stormwater LOS:** Contains data for various asset types and materials, with columns for 'Asset Type', 'Material', 'Cost estimate', and 'Annualized Cost'.
- Water Main LOS:** Similarly structured for water main assets.

 The spreadsheet uses color-coding (yellow and orange) to highlight specific rows and columns.

Level-of-Service Worksheet

The Rate Structure Worksheet provides a financial overview of the stormwater program. It includes:

- Program Name:** Lists various programs and their associated costs and revenues.
- Cost:** Columns for different cost components.
- Revenue:** Columns for different revenue sources.

 The data is summarized in a table with a total row at the bottom.

Rate Structure Worksheet

The Guide document is titled "Toolkit to Support Financial Planning for Municipal Stormwater Programs" and is dated August 2018. It is published by the US EPA Region 9 Environmental Finance Center at Sacramento State.

Introduction

The TEC at Sacramento State is operated by the Office of Water Programs (OWP) at California State University, Sacramento. The EFC serves Region 9 state and local governments, tribal communities, and the private sector in the areas of financial planning and asset management. The goal of the TEC is to enable these entities to become capable of leading environmental and public health services, in the short term, and to be able to adapt to future needs as regulations, technology, and resources change.

In managing stormwater, municipalities throughout the U.S. must maintain conveyance infrastructure to mitigate urban flooding and comply with National Pollutant Discharge and Elimination System (NPDES) permits. As part of its applied research and outreach activities, the EFC developed a stormwater financing toolkit to assist communities in identifying short- and long-term municipal stormwater program expenses and developing a stormwater utility fee that may be used as (partial) revenue. The toolkit guides users in assembling costs for maintaining current assets, ensuring permit compliance, and building assets in the future. The toolkit also provides a means to record data and conduct calculations for estimating a stormwater utility rate structure, including an ability-to-pay analysis for residential property owners. The toolkit was assembled as part of direct municipal assistance in the EPA Region 9 jurisdiction and has been tested in real-life planning situations for municipal stormwater.

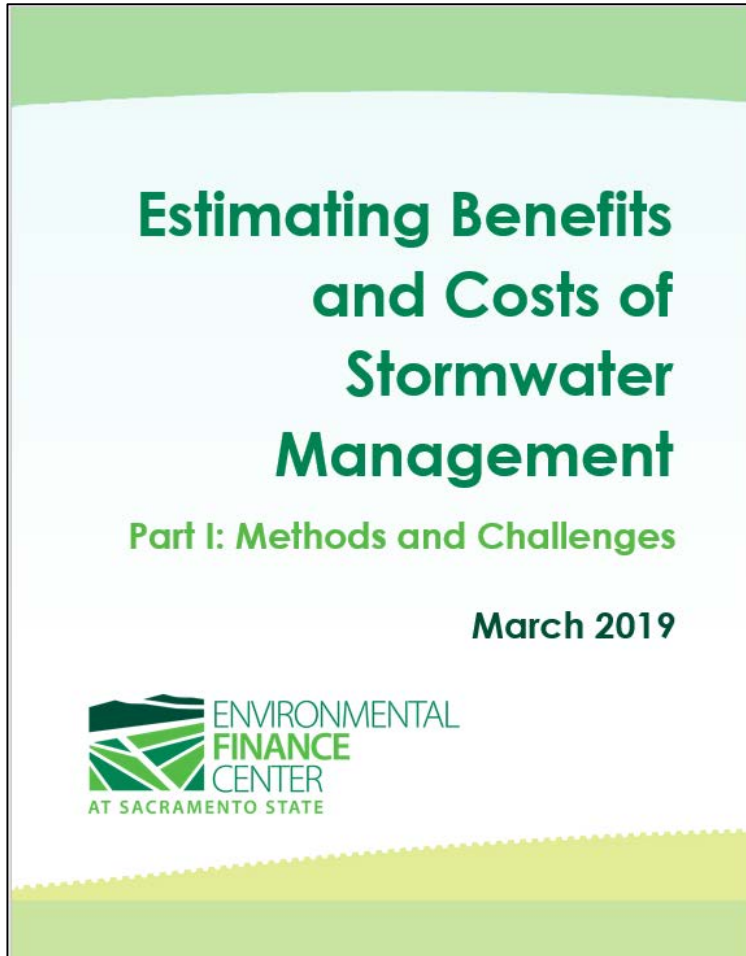
Like most analysis and modeling efforts, data collection and integration contributes the majority of work. Stormwater utility managers may have to update or develop from scratch system asset inventories. Unit and program cost data will need to be mined from accounting records, and property and census data will need to be assembled to estimate key factors that support utility billing systems. The toolkit and this document were developed to guide the user in not just what to do, but how to do it where to get the necessary data.

The document is divided into the following sections:

- Background
- Assembling Program Costs and Evaluating Revenues
- Review of the EFC Stormwater Financing Toolkit

Guide

Project: Developing Cost Resources



- Current project to develop resources for costs of stormwater management
 - Evolving task
- Fill in gaps of other current projects for added value
 - Regional differences
 - Program costs
 - Comparable unit costs
 - ??

Types of Costs

- Permit compliance
- Existing infrastructure
(operations and maintenance)
- New infrastructure

Example Cost Categories

Labor

Materials

Operations

Contingencies

Planning

Permitting

Assembling Cost Data

- 1) Surveying current data sources
- 2) Understanding ways to report costs
- 3) Looking for new sources to address data gaps
- 4) Recommendations

Collecting Standardized Data vs. Integrating Collected Data:

Separate tasks, both are useful

Uncovering Data Sources

Units in Thousand dollars

PROGRAM ELEMENT	03-04	04-05	05-06	06-07	07-08	08-09	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	SOURCE OF FUNDS
A.1 Maintenance of Structural Controls	823.0	848.0	933.0	979.4	1,034.0	1,065.0	1,065.0	1,065.0	1,065.0	1,250.0	4,800.0	4,800.0	4,800.0	4,800.0	4,800.0	4,800.0	Sewer Enterprise Fund & Water Enterprise Fund
A.2 New Development/Redevelopment	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N/A
A.3 Road Operation & Maintenance	5,022.0	5,173.0	5,600.0	5,975.0	6,273.6	6,462.0	6,462.0	6,462.3	7,500.0	9,000.0	10,900.0	10,900.0	10,900.0	10,900.0	10,900.0	10,900.0	Gas Tax, Sewer, General and Refuse Fund
A.4 Flood Management Projects	0	0	0	0	0	0	0	0	0	0	20.0	22.0	22.0	22.0	22.0	22.0	Water Enterprise Fund
A.5 Controls for Landfills	236.0	6,050.0	3,559.0	3,559.0	3,381.0	3,482.0	3,482.0	3,482.0	3,482.4	3,400.0	4.0	4.0	4.0	4.0	4.0	4.0	Solid Waste Fees
A.6 Controls for Pesticides	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N/A
A.7 Illicit Discharge Controls	19.0	19.5	24.5	25.7	26.9	27.7	27.7	27.7	27.8	4.8	8.6	6.5	6.3	6.3	6.3	6.3	Sewer Enterprise Fund
A.8 Spill Prevention	421.0	426.0	469.0	462.0	517.0	533.0	533.0	533.1	499.0	499.0	552.3	580.0	580.0	580.0	580.0	580.0	Business Service Fees (Fire Prevention Services)
A.9 Illegal Dumping Controls	1.5	1.5	1.9	2.1	2.5	2.6	2.6	2.6	2.6	0.5	0.8	0.6	0.6	0.6	0.6	0.6	Sewer Enterprise Fund
A.10 Leaking Sanitary Controls	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N/A
A.11 Inspection & Control Measures	28	29	31.9	33.5	35.2	36.3	36.3	36.3	36.3	6.3	11.5	8.6	8.4	8.4	8.4	8.4	Sewer Enterprise Fund
A.12 Industrial Monitoring	552.0	598.0	658.0	691.0	725.0	747.0	747.0	747.0	747.0	131.3	237.9	178.6					
A.13 Site Planning Procedures	241.0	248.0	260.0	273.5	287.0	295.0	295.0	295.0	295.7	475.0	475.0	475.0					
A.14 Structural & Non-Structural BMP's	26.0	27.0	29.7	31.2	32.8	33.8	33.8	33.8	33.9	30.0	30.0	30.0					
A.15 Site Inspections & Control Measures	62.0	63.0	69.0	72.8	76.4	78.7	78.7	78.7	78.7	30.0	30.0	30.0					
A.16 Education/Training for Constr. Site Operators	1.4	1.5	1.8	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0					
B. Estimate of Loads & EMC's	7.6	7.6	8.1	8.1	8.5	8.8	8.8	8.8	8.8	9.6	10.2	10.7					
C. Wet-weather Monitoring and Administration																	
of the NPDES Program	70.0	75.0	82.5	82.5	82.5	85.0	85.0	85.0	85.1	95.0	100.0	200.0					
TOTALS	7,610.5	13,567.1	11,818.4	12,227.7	12,484.3	12,858.9	12,858.9	12,858.9	12,860.7	13,433.5	15,269.0	26,218.3					

Notes : Values of expenditures are approximate only.

EXPENDITURES - OVERVIEW BY FUND AND FUNCTION

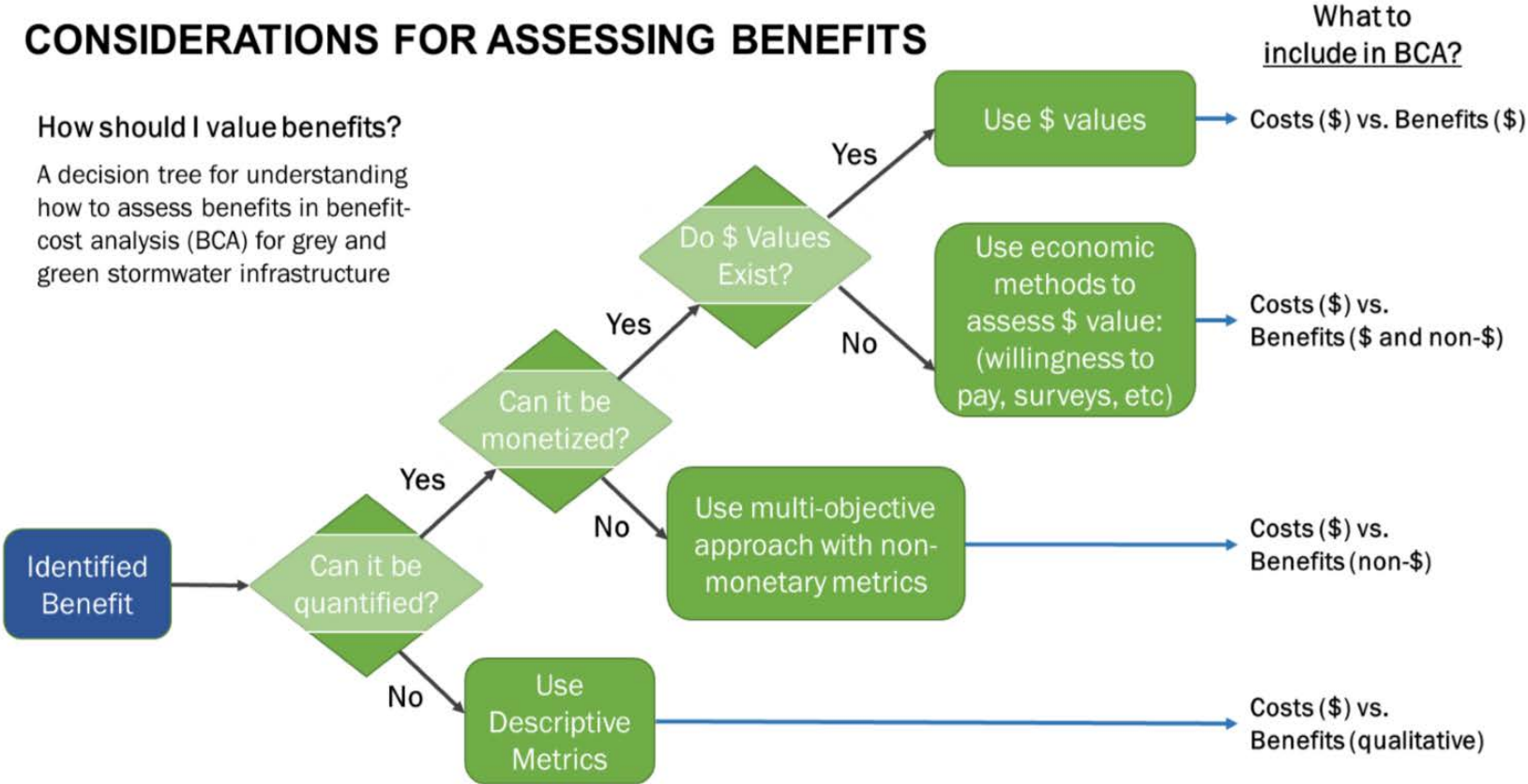
DEPARTMENT	FISCAL YEAR 2013-14			BUDGET		
	AS ADOPTED	AS AMENDED	PROJECTED 6/30/2014	FY 2014-15	FY 2015-16	FY 2016-17
GENERAL FUND						
GENERAL GOVERNMENT						
City Council	\$ 266,650	\$ 266,650	\$ 265,632	\$ 280,493	\$ 296,838	\$ 311,208
Administration	1,415,802	1,589,451	2,154,439	1,513,603	1,716,165	1,787,386
Housing & Neighborhood Services	995,525	1,011,865	990,459	1,093,108	1,031,899	1,070,015
City Attorney	719,600	719,600	679,300	720,300	720,300	720,300
City Clerk	425,714	445,839	417,182	484,391	463,938	513,978
Human Resources/Risk Management	3,103,275	3,406,154	3,630,779	3,588,474	3,487,916	3,397,814
Finance/Information Systems	2,558,178	2,838,755	2,630,307	2,491,226	2,558,839	2,579,926
Real Property Services	3,826,531	4,015,826	4,035,775	4,339,081	4,225,831	4,091,311
Total General Government	13,311,275	14,294,140	14,803,873	14,510,676	14,501,726	14,471,938
PUBLIC WORKS						
Operations	8,643,572	8,678,132	7,997,200	8,638,972	8,712,664	8,990,176
Engineering	2,884,044	2,891,699	2,805,047	3,182,262	3,182,128	3,334,280
Storm Water Program Management	1,056,233	1,056,833	597,510	659,069	678,379	696,094
Total Public Works	12,583,849	12,626,664	11,399,757	12,480,303	12,573,171	13,020,550
DEVELOPMENT SERVICES						
Planning	1,527,676	1,554,701	1,312,984	1,713,310	1,668,361	1,545,530
Building	1,174,564	1,176,988	979,761	1,330,947	1,327,248	1,394,720
Total Development Services	2,702,240	2,731,689	2,292,745	3,044,257	2,995,609	2,940,250

Annual Reporting Requirements

Benefits and Costs

CONSIDERATIONS FOR ASSESSING BENEFITS

How should I value benefits?
A decision tree for understanding how to assess benefits in benefit-cost analysis (BCA) for grey and green stormwater infrastructure



Funding and Rate Structures

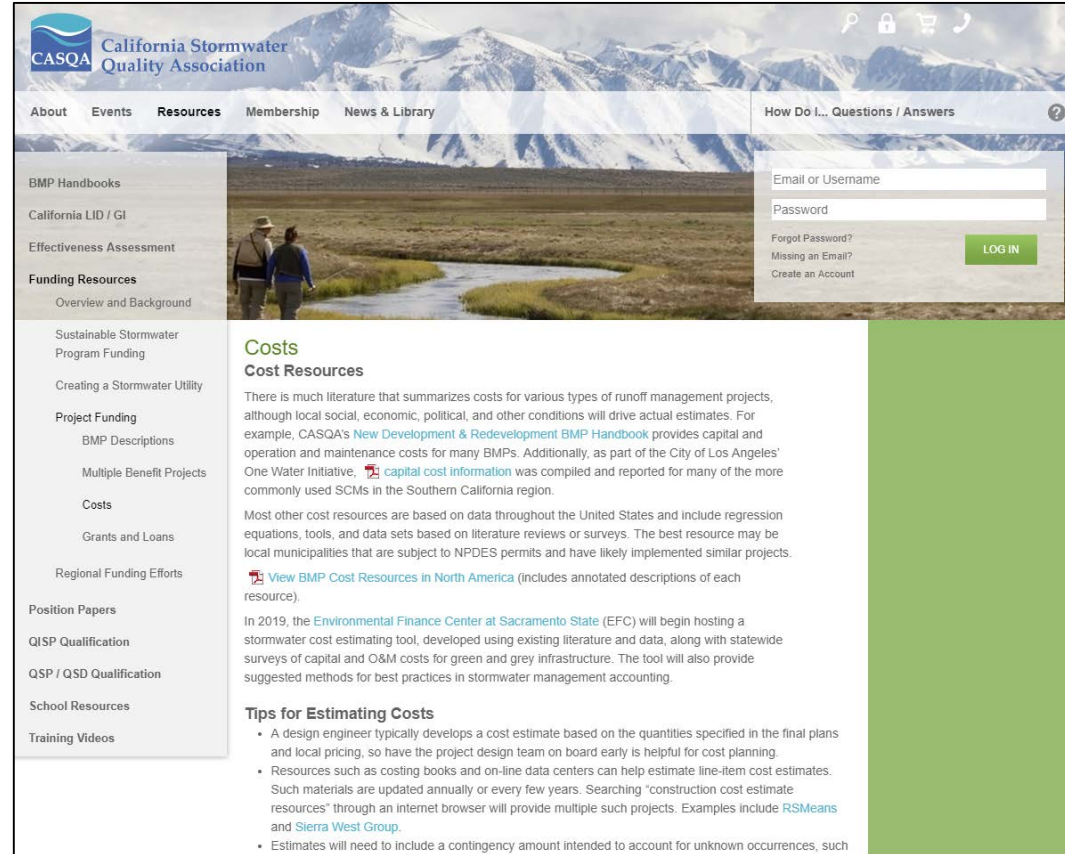
Compiled existing stormwater rates and fees across California municipalities

Extensive survey, but not exhaustive

Jurisdiction	Status	Fee Description	Monthly Rate (Residential)	Year	Funding Mechanism	Source
Area Charges						
San Bruno	NA	Area Charge (per acre)	4.2 (per acre)	1993	NI	WKU (2018)
Elk Grove	NI	Area Charge (per acre)	7.28 (per acre)	2004	NI	WKU (2018)
City of Davis	NA	Area Charge (per sq-ft)	\$0.000224 (per sq-ft)	NI	NI	OWP (2018)
City of Huntington Park	NI	Base Rate & Impervious Area Charge	\$7.15 (<3000 sq ft.), \$1.05 per 1000 sq ft	2014	NI	OWP (2018)
San Diego	NA	By Water Usage	\$0.95	1990	NI	WKU (2018)
Equivalent Residential Units (ERUs)						
Tracy	NI	ERU	\$1.20 / ERU	NI	NI	WKU (2018)
Citrus Heights	NI	ERU	NI	1997	NI	WKU (2018)
Ontario	NI	ERU	NI	2002	NI	WKU (2018)
Palo Alto	Unsuccessful	ERU	\$4.75 / ERU	2003	Balloted Property Related Fee	SCI (2018)
Palo Alto	Successful	ERU	\$10.00 / ERU	2005	Balloted Property Related Fee	SCI (2018)
Santa Clarita	Successful	ERU	\$1.75 / ERU	2009	Balloted Property Related Fee	SCI (2018)
Palo Alto	Successfully Renewed	ERU	\$13.65	2017	Balloted Property Related Fee	SCI (2018)
Larkspur	NA	ERU	NI	1995	NI	WKU (2018)

Seeking Input

- Data sources for costs
- Methods for creating comparable costs
- Additional needs and gaps



The screenshot shows the CASQA (California Stormwater Quality Association) website. The header includes the CASQA logo and navigation links: About, Events, Resources, Membership, and News & Library. A search bar and utility icons (magnifying glass, lock, shopping cart, user) are in the top right. A sidebar on the left lists various resource categories, with 'Funding Resources' expanded to show 'Costs'. The main content area is titled 'Costs' and 'Cost Resources'. It contains a paragraph of text, a link to 'View BMP Cost Resources in North America', and a section titled 'Tips for Estimating Costs' with a bulleted list of advice.

Costs
Cost Resources

There is much literature that summarizes costs for various types of runoff management projects, although local social, economic, political, and other conditions will drive actual estimates. For example, CASQA's [New Development & Redevelopment BMP Handbook](#) provides capital and operation and maintenance costs for many BMPs. Additionally, as part of the City of Los Angeles' One Water Initiative, [capital cost information](#) was compiled and reported for many of the more commonly used SCMs in the Southern California region.

Most other cost resources are based on data throughout the United States and include regression equations, tools, and data sets based on literature reviews or surveys. The best resource may be local municipalities that are subject to NPDES permits and have likely implemented similar projects.

[View BMP Cost Resources in North America](#) (includes annotated descriptions of each resource).

In 2019, the [Environmental Finance Center at Sacramento State](#) (EFC) will begin hosting a stormwater cost estimating tool, developed using existing literature and data, along with statewide surveys of capital and O&M costs for green and grey infrastructure. The tool will also provide suggested methods for best practices in stormwater management accounting.

Tips for Estimating Costs

- A design engineer typically develops a cost estimate based on the quantiles specified in the final plans and local pricing, so have the project design team on board early is helpful for cost planning.
- Resources such as costing books and on-line data centers can help estimate line-item cost estimates. Such materials are updated annually or every few years. Searching "construction cost estimate resources" through an internet browser will provide multiple such projects. Examples include [RSMMeans](#) and [Sierra West Group](#).
- Estimates will need to include a contingency amount intended to account for unknown occurrences, such

Links

EPA Region 9 Environmental Finance Center:

<http://www.efc.csus.edu>

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Understanding Terms

- **Stormwater Plan:** Description of activities to meet water quality and integrated water management goals.
- **Stormwater Program:** Institutions (personnel, departments, \$\$ accounts) that carry out plans.
- **Asset Management:** Organized process improve your systems and spend money wisely.
- **Financial Plan:** Data-driven analysis to justify your existence.