

Cost Calculators

Bucket No. 1: Non-Structural

1-yr watershed program,
compound interest over 40 yrs

Bucket No. 2: Structural

40-yr watershed program: sum of
individual BMPs
(Implementation + O&M)

Bucket No. 3: Restoration/Treatment

40-yr watershed program

Watershed Class Total

The image displays three screenshots of a cost calculator spreadsheet, likely used for estimating the costs of various watershed management programs. Each screenshot shows a detailed table with columns for program type, implementation cost, and other financial metrics. The tables are color-coded and include summary rows at the bottom of each section.

Bucket No. 1: Non-Structural

Program	Implementation Cost	Annual O&M Cost	40-yr Total Cost
Non-Structural

Bucket No. 2: Structural

Program	Implementation Cost	Annual O&M Cost	40-yr Total Cost
Structural

Bucket No. 3: Restoration/Treatment

Program	Implementation Cost	Annual O&M Cost	40-yr Total Cost
Restoration/Treatment

Watershed Class Total

Category	Cost
Non-Structural	...
Structural	...
Restoration/Treatment	...
Total	...

Bucket No. 1 Calculator

Agencies in Watershed

Watershed Program Cost by Agency Size
(i.e. Small, Medium, Large)

BUCKET #1 - Permit Required & Nonstructural BMPs
San Diego River "Pilot" Watershed - Integrated Approach
Permit required programs, plus enhanced non-structural initiatives are included in this bucket. Enhanced non-structural programs reduces the total acreage to be treated with structural BMPs.

MODEY CODE EACH WATERSHED	County of SD	City of SD	City of La Mesa	City of El Cajon	City of Poway	Total Acres to be Treated
Agency Size Class	sq	sq	sq	sq	sq	
Agency Area in Watershed (Acres)	107,364	46,774	3,027	9,249	10,575	187,039
Agency Developed Area (Acres)	48,718	26,589	1,738	7,707	0	84,752
Agency Undeveloped Area (Acres)	58,646	20,185	1,289	1,542	10,575	102,287
Agency Agricultural Area (Acres)	14,970	0	0	0	0	14,970

Bucket #1 BMP (1)	1st Watershed (\$/Watershed)	2nd Watershed (\$/Watershed)	3rd Watershed (\$/Watershed)	% of 1st year Total	Total Cost (Millions)
Watershed Program Administration (2)	\$18,000	\$18,000	\$18,000	1.1%	\$54,000
Permit Fees (2)	\$4,857	\$5,000	\$4,571	0.2%	\$14,428
Outreach	\$10,000	\$60,000	\$400,000	4.4%	\$500,000
Permit/Compliance Monitoring	\$45,000	\$80,000	\$550,000	5.4%	\$675,000
Inspections / Enforcement	\$80,000	\$120,000	\$300,000	6.0%	\$500,000
Code Modifications/Enforcement	\$50,000	\$100,000	\$350,000	3.6%	\$500,000
Market Planning (see Table 1.1)	\$100,000	\$50,000	\$750,000	7.8%	\$950,000
Agriculture Education & BMP Cost Sharing Program (6)	\$20,000	\$10,000	\$80,000	0.7%	\$110,000
Targeted Outreach/CRSM	\$25,000	\$75,000	\$1,000,000	8.7%	\$1,300,000
Special Studies (5)	\$45,000	\$100,000	\$600,000	5.4%	\$790,000
Targeted Enforcement	\$45,000	\$80,000	\$500,000	4.4%	\$625,000
BMP Assessment Studies (4)	\$100,000	\$750,000	\$1,300,000	9.3%	\$2,050,000
Non-Structural General Controls	\$100,000	\$750,000	\$1,300,000	23.1%	\$2,050,000
Watershed Total for 40th year of Program (10-year)				100.0%	\$21,210,000

Annual Program Growth (set at 1.5 times the standard inflation rate)	Total 40 year Watershed Program =	Bucket #1 - Total Cost / Watershed Sq. Mi. (millions)	Total Cost per Developed Sq. Mi. (millions)
4.0%	\$14,311,213,964	\$5.33	\$106.12

COLOR CODING FOR TARGETED SOURCE

- SOURCE CONTROL
- RUNOFF REDUCTION
- AGRICULTURE PRACTICE CONTROL
- LOW IMPACT DEVELOPMENT
- DESIGN/CONSTRUCTION

REGULATION FOOTNOTES:

- Program costs were scaled according to agency "size." Size was determined based on budget, area, and population per square mile. Small agencies had budgets of less than \$1M and jurisdiction over 10 square miles or fewer. Larger agencies had budgets greater than or equal to \$10M and jurisdiction over more than 100 square miles. Medium were all agencies between small and large.
- Permit fees are from agency budgets from the 2008/2009 SBMFP annual reports, classified by agency size. Annual permit fees were divided by an assumed number of watersheds for the agency size to translate the values to a Watershed level. The typical permit fee for small agencies was divided by 1.5 watersheds; Medium agency fee by 2.5 watersheds; Large agency fee by 7 watersheds.
- Assume this cost is applied to two (2) of the 40 year program (i.e. 20% of overall timeline).
- Assume a single program has been administered by the County. Given the limited agricultural land in this watershed, no additional regional funding is assumed.
- Assume special studies will only be necessary for 10 years of the 40 year program.
- Equal to 25% of total cost of implementing one pilot project of major Structural BMPs listed in Bucket #2. Cost of BMP Assessment Studies is only applicable to initial pilot studies. This cost was only applied for the first year of the 40-year program.

$$\begin{aligned} & \# \text{ Small Agencies} * \text{ Small Cost} \\ & + \# \text{ Medium Agencies} * \text{ Medium Cost} \\ & + \# \text{ Large Agencies} * \text{ Large Cost} \end{aligned}$$

Annual BMP-Specific Program Cost

Annual Cost (\$M),
simple compounded
interest

40-yr Cost
(\$M / developed sq. mi.)

Bucket No. 3 Calculator

Channelized Length of River

Restore 10% of Channelized Length

Municipalities	Length Rivers in City SD (ft)	Length Modified (ft)	% Rivers Modified
County of SD (1)	548,735	109,747	20.00%
City of SD (2)	136,567	49,632	36.34%
City of La Mesa	0	0	-
City of El Cajon (1)	34,329	32,613	95.00%
City of Santee (1)	31,135	1,557	5.00%
City of Poway	0	0	-
San Diego Rivers (major tributaries)	750,766	193,548	-

Bucket #3 BMP	Assumed Tributary Area (acres)	Assumed Cost (\$)	Assumed \$/Acre/40yrs	Actual Project, Cost Validation	Final Tributary Area (acres)	Final Cost (\$)	\$/Acre/40yrs	Quantity	Total Tributary Area (Acres)	BMPs by Type (% Total)	Total Cost (Millions)
Channel Restoration (4) (5) (6)	0.16	\$2,500	\$15,625	\$1.1K / foot - \$1.8K / foot	0.16	\$1,524	\$9,527	19,355	3,097	7.7%	\$30

BUCKET #3 - Total Cost per Watershed Square Mile (millions) = \$2.08
 Total Cost per Developed Sq. Mi. (millions) = \$6.44
 Total Cost per Urban Sq. Mi. (millions) = \$6.79
 Total Cost per Ag Sq. Mi. (millions) = \$123.57

CALCULATION FOOTNOTES:
 (1) The SanGIS "Rivers" GIS dataset was used to identify the total length of channelized/stered riverbed for major tributaries. Best professional judgement was used to delineate this length for each municipality.
 (2) The SanGIS "Rivers" GIS dataset and "Drainage Conveyance" GIS layer for the City of San Diego identifies the length of channelized or altered river.
 (3) Assumes all Erosion BMPs are 50% effective in sediment control; applies an area reduction to the total acreage treated.
 (4) While restoration improves water quality for areas beyond the restored area, this pollutant load reduction is conservatively set to equal to the restored area.
 (5) Cost in terms of linear foot of channel, stream, or wetland. The quantity restored is equal to 10% of the total modified length.
 (6) Based on acreage impacted for linear foot of channel from Upstream Restoration (City of San Diego Sustainable Waters Program).
 (7) Land acquisition assumptions used for Medium BMPs in Bucket #2. (i.e. need to acquire land for 50% of BMPs with a footprint of 0.02 ac/1 ac tributary).
 (8) Land acquisition assumptions used for Bucket #2. (i.e. need to acquire land for 30% of BMPs with a footprint of 0.02 ac/1 ac tributary).

(5) Channel restoration costs are typically in \$/ Foot.

Same as Bucket No. 2, just larger treated areas and higher project costs

Scaling From a Calculator

Bucket 1+Bucket 2+Bucket 3
Normalized Costs

Watershed Cost

Class	Watershed	Developed Area (miles ²)	\$ M / Watershed Mile ²	\$ M / Developed Mile ²	Total Watershed Cost
'SAN DIEGO'	San Diego River	140.1	\$12.6	\$39.1	\$5.47
	Otay Valley	48.0	-	-	\$1.88B
	Sweetwater	89.9	-	-	\$3.52B
'PUEBLO'	Pueblo	53.0	\$50.4	\$55.7	\$2.95B
	Mission Bay	44.3	-	-	\$2.47B
	Carlsbad	142.5	-	-	\$7.93B
	Los Peñasquitos	54.8	-	-	\$3.05B
'SAN LUIS REY'	San Luis Rey	209.3	\$10.4	\$27.7	\$5.81B
	San Dieguito River	133.0	-	-	\$3.69B
	Santa Margarita	31.3	-	-	\$0.87B
	Region 7	42.7	-	-	\$1.18B
'TIJUANA'	Tijuana River	71.3	\$5.7	\$37.6	\$2.68B
TOTAL COST FOR 40 YEAR PROGRAM FOR SAN DIEGO:					<u>\$41.5 B</u>

Area *
Normalized
Cost