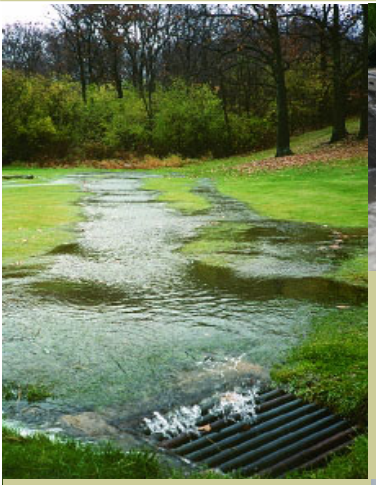
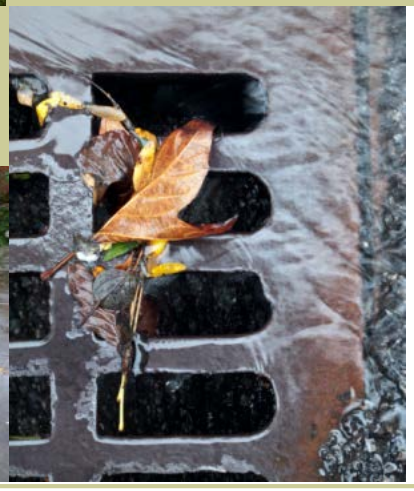


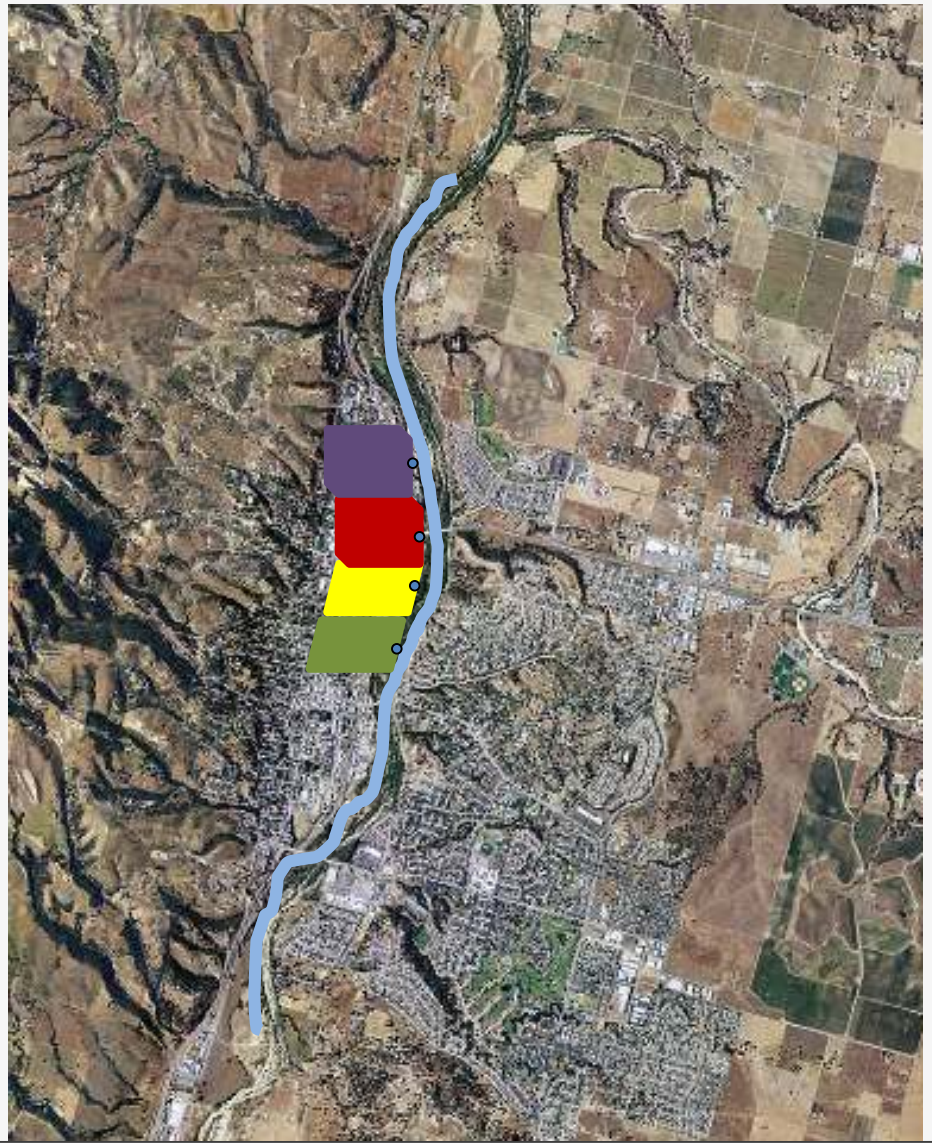
Manage stormwater as a resource and track effectiveness



Nicole Beck, PhD (2NDNATURE)
Dave LaCaro (City of Paso Robles)

EPA Stormwater Workshop
September 23 2015

Prioritize Actions and Quantify Effectiveness



Monitor and Model

Where actions are implemented

Assume

Reducing stormwater loading to receiving waters will improve receiving water quality

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GUIDING PRINCIPALS of METHOD

1. Reasonable assurance inform the right decisions most of the time
2. Scientifically defensible yet as simple as possible
3. Focus on siting, managing and quantify the benefits of BMPs
4. Feasible cost-effective level of effort for stormwater managers to implement and maintain
5. Clear, standardized powerful communication tools

Process to Prioritize and Assess Effectiveness

1 **Detailed *mapping*** *guidance*

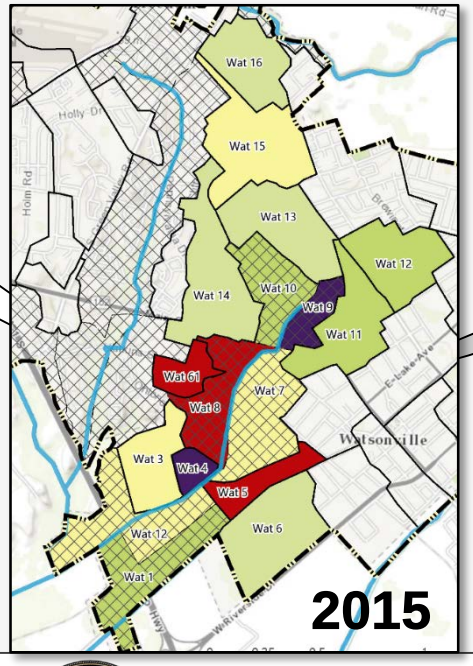
2 **Inventory BMPs Assess performance**

BMP RAM

Quantify pollutant load reductions 3

TELR

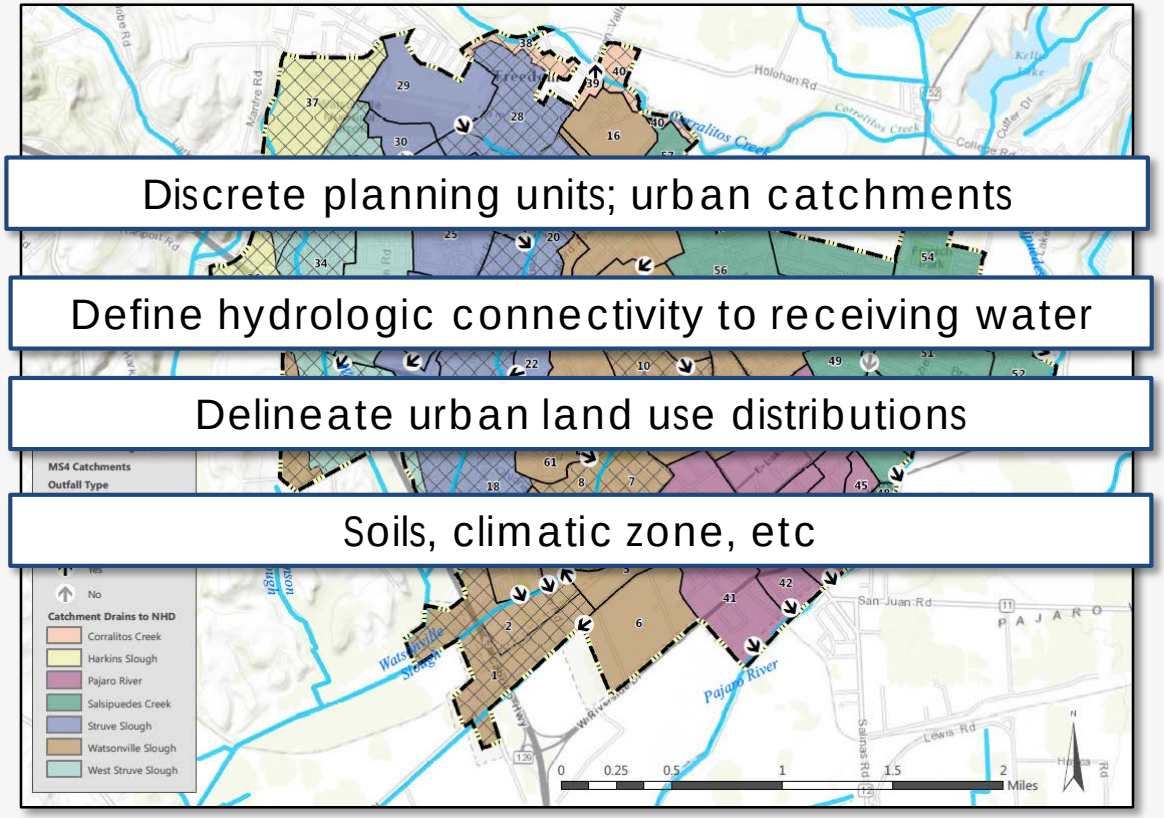
Prioritize what BMPs next 4



iterate annually

Detailed Mapping Guidance

Map MS4 for TELR Inputs



1. Discrete planning units; urban catchments
2. Define hydrologic connectivity to receiving water
3. Delineate urban land use distributions
4. Soils, climatic zone, etc

Publically available guidance webinars
www.2ndnaturellc.com

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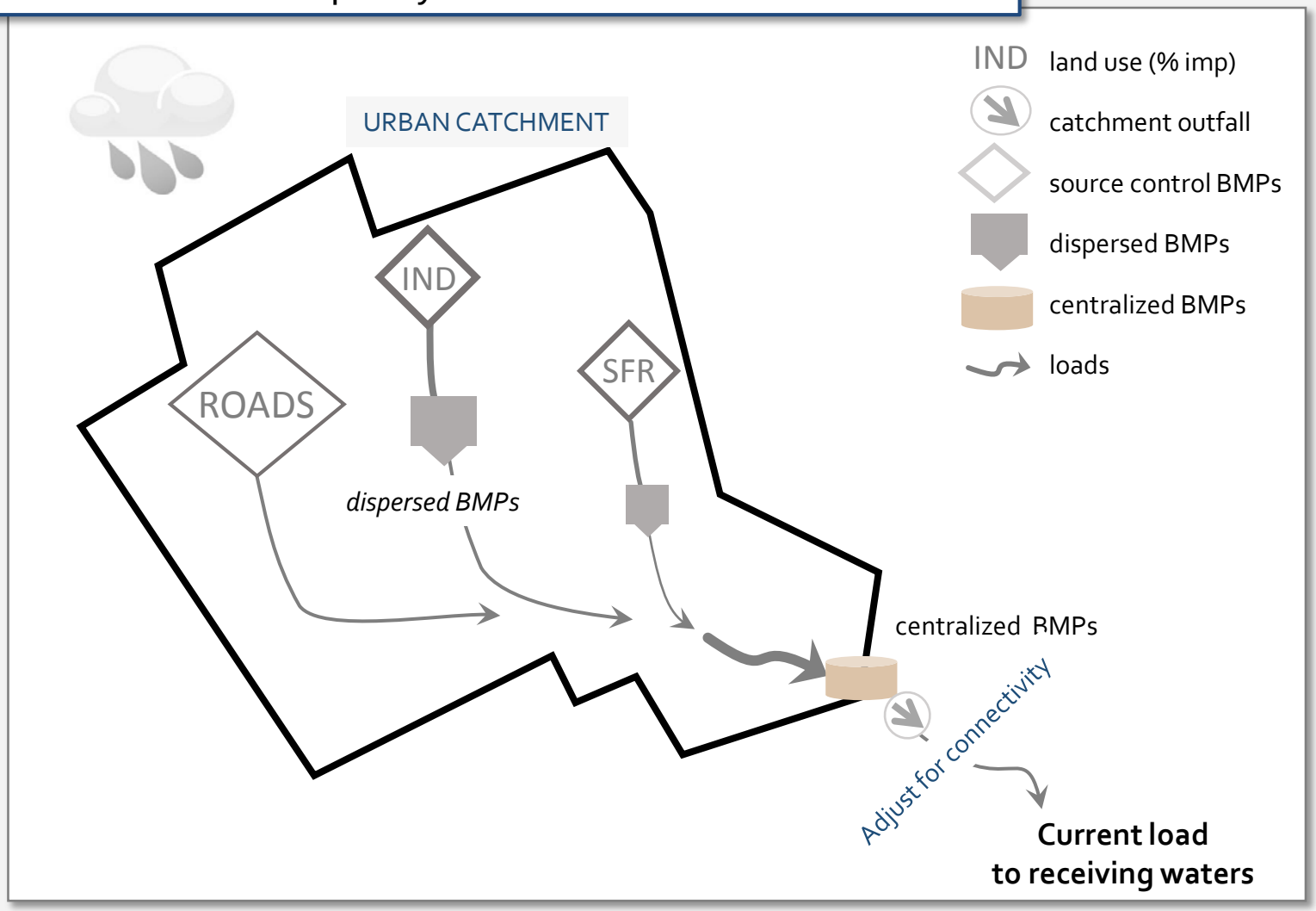
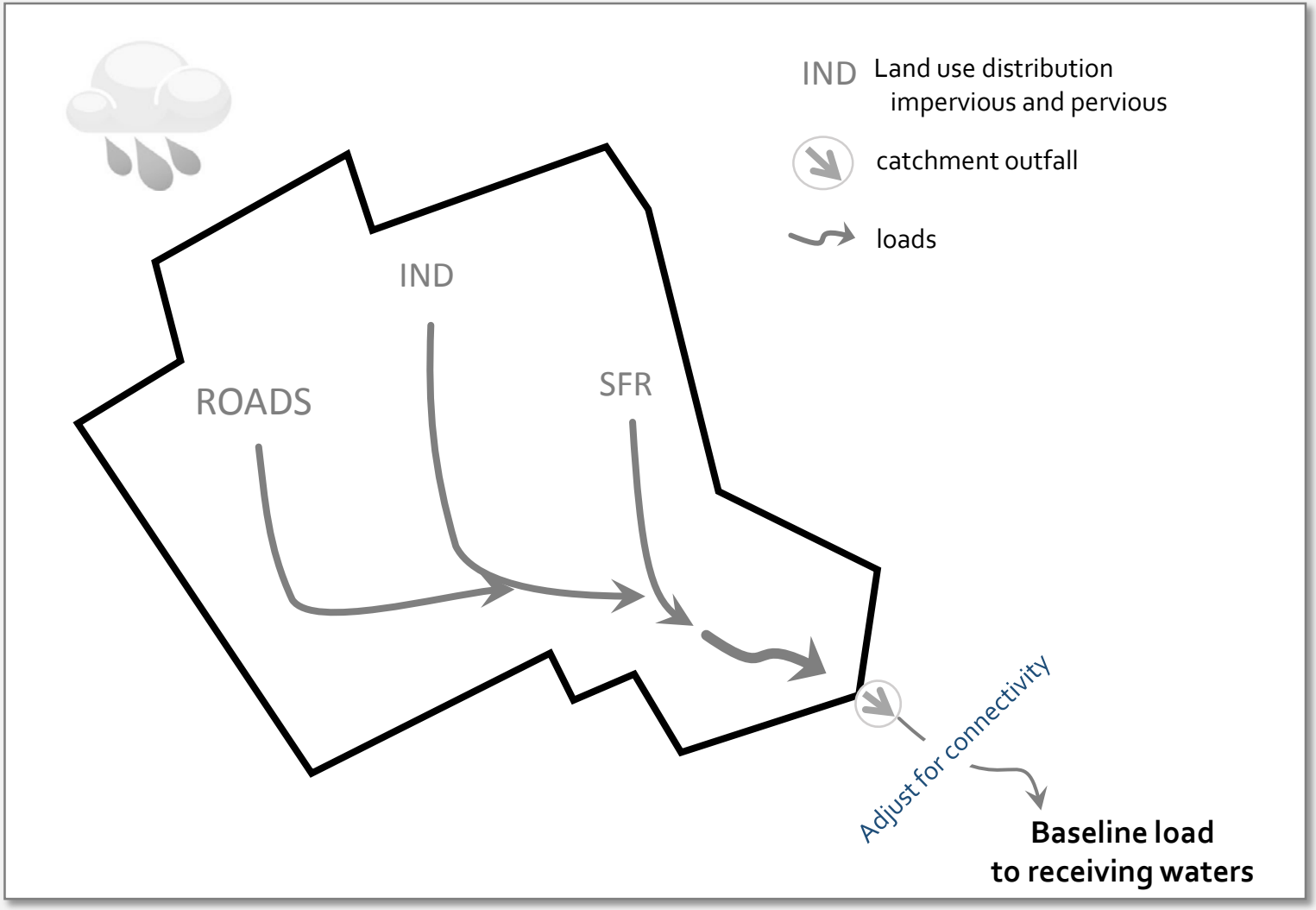
Cumulative water quality benefits of stormwater BMPs



Baseline Load (no BMPs)



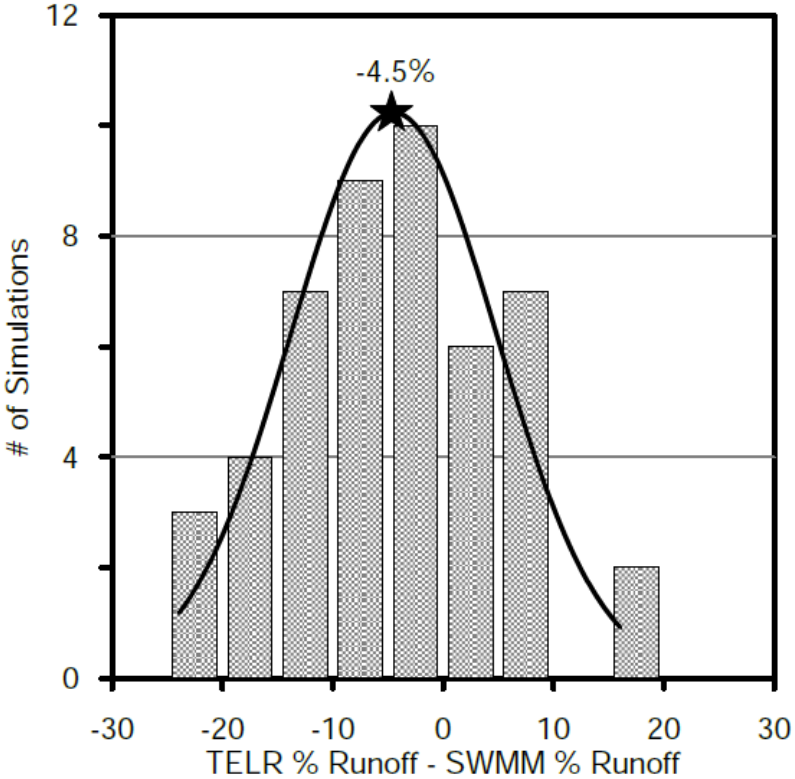
Tool to Estimate Load Reductions

1 Scientifically defensible yet simple as possible

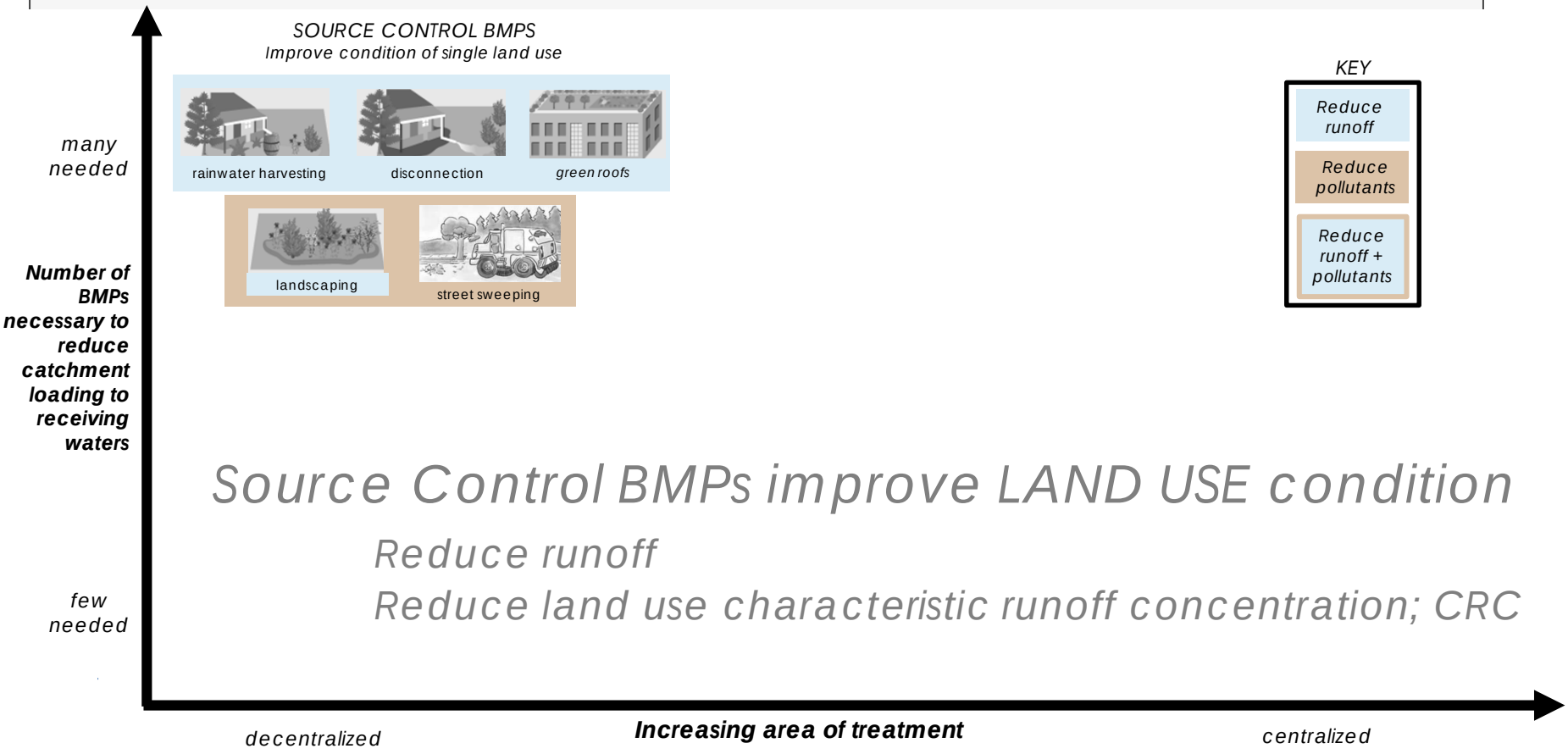
SWMM, HSPF, etc.

Simulation Characteristics

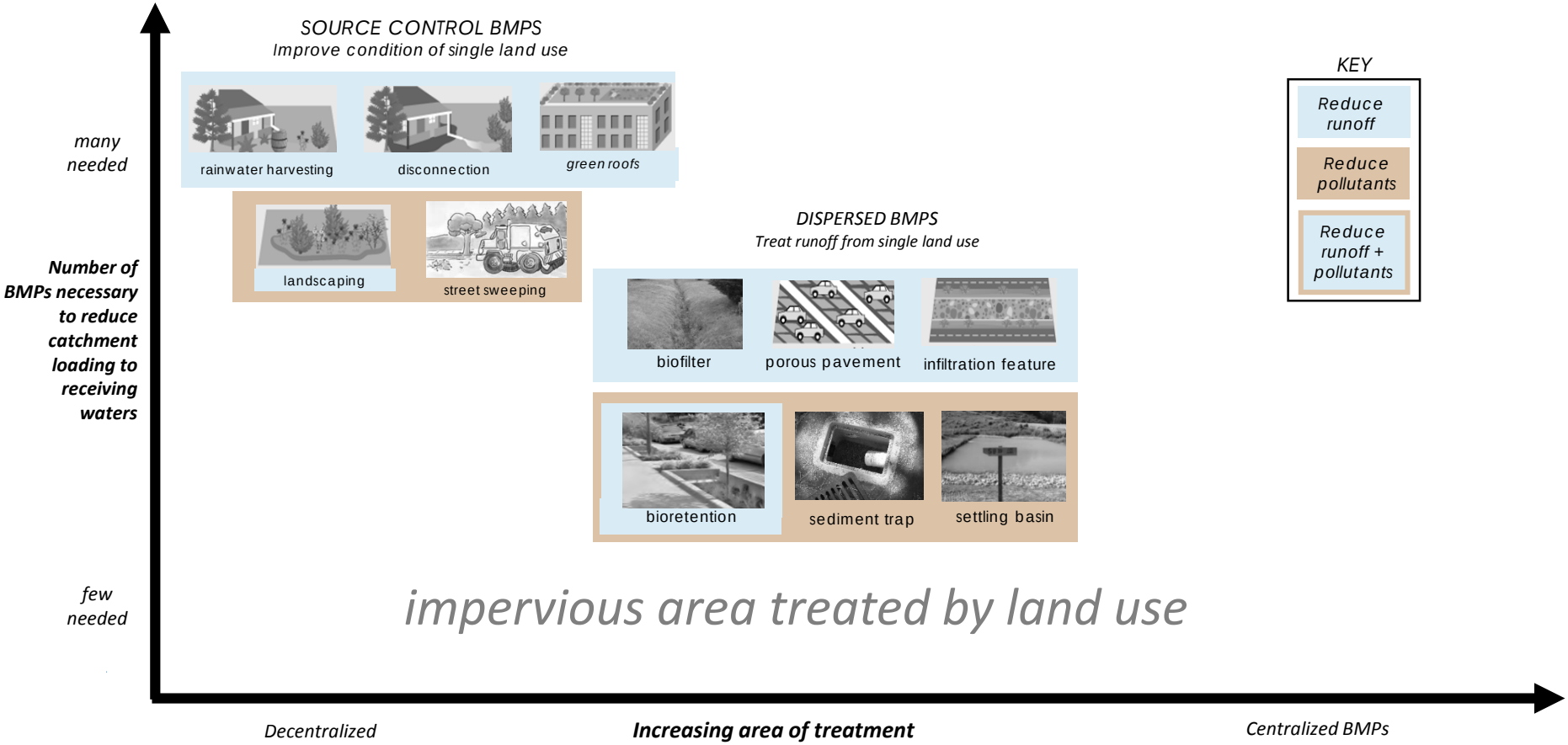
- 100 acre catchment
- Range of imperviousness of 5 to 95%
- All soil groups A, B, C, D
- 3 different precipitation zones
- No BMPs



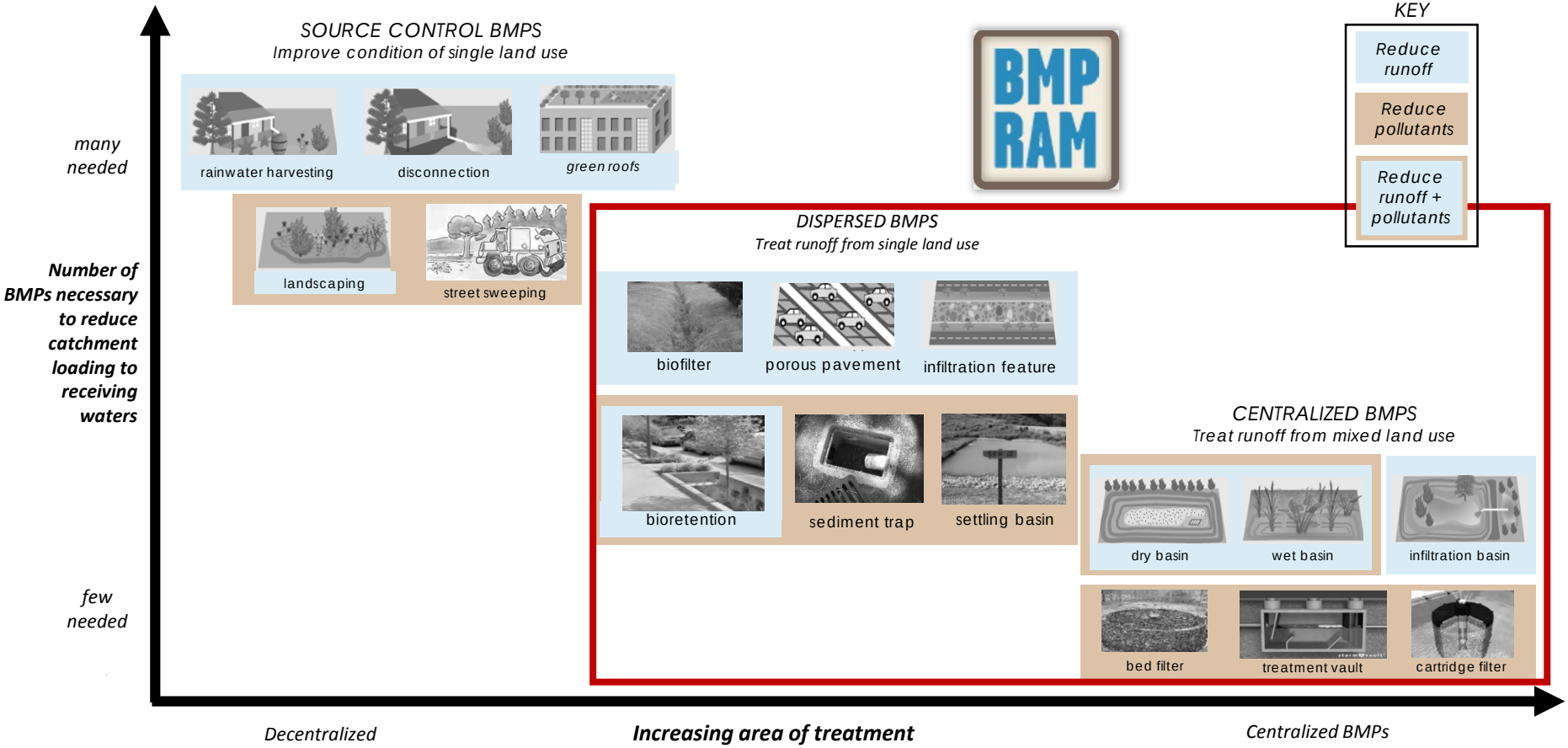
BMP Categories: **Source Control BMPs**



BMP Categories: **Dispersed BMPs**



BMP Categories: **Centralized BMPs**



Inventory and Assess Stormwater BMPs

BMP RAM SCORES

Learn More | Download | User: Demo | Home | Logout

INVENTORY

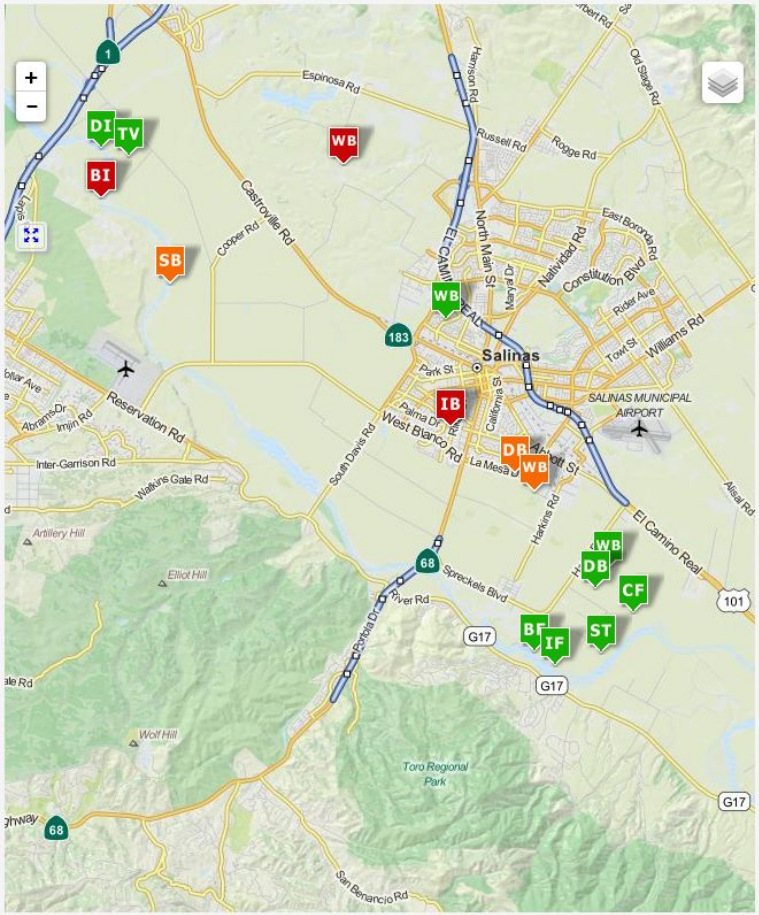
BENCHMARK & THRESHOLD

FIELD OBSERVATIONS

BMP RAM SCORES

BMP REPORT

Product of:
2NDNATURE, LLC



BMP RAM scores can be viewed by observation date and score.

Search for BMPs | Type here...

BMP ID	BMP Type	Observation Date	Score
BLUELAKE	Dry Basin	2014-06-17	2.8
ELOISE	Wet Basin	2014-09-23	2.4
LOWERPARK	Dry Basin	2014-07-07	4.8
Maggie	Infiltration Basin	2015-08-03	2.0
Maggie3	Infiltration Basin	2015-03-24	3.7
OSGOOD	Wet Basin	2015-02-04	5.0
PASADENA	Cartridge Filter	2015-02-04	5.0
PINEST	Sediment Trap	2014-04-02	4.8
SKIINF	Infiltration Feature	2015-07-29	4.4
TESTBF	Bed Filter	2014-09-27	5.0
TESTBIO	Biofilter	2015-07-13	2.0
TESTDI	Drop Inlet	2014-09-27	5.0
TESTSB	Settling Basin	2014-09-26	2.3
TESTTV	Treatment Vault	2015-01-30	4.4
UPPER_PARK	Wet Basin	2015-08-07	2.0
WB55	Wet Basin	2015-02-05	4.7
YOUNGBASIN	Infiltration Basin	2014-04-02	0.4

Current | Maintenance | Date Range | Download

www.BMPRAM.com

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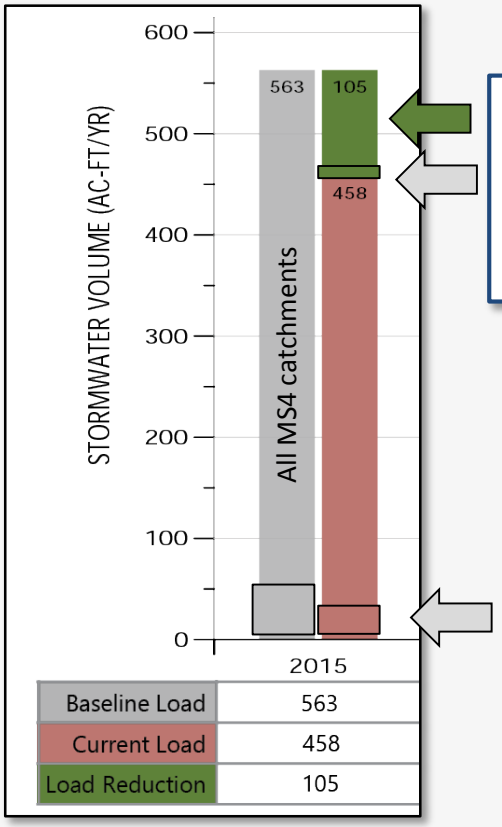
Report Program Effectiveness



2015
Cumulative load reduction to receiving waters
105 ac ft
(18%)

Baseline Load

Load **without** stormwater BMPs.

Current Load

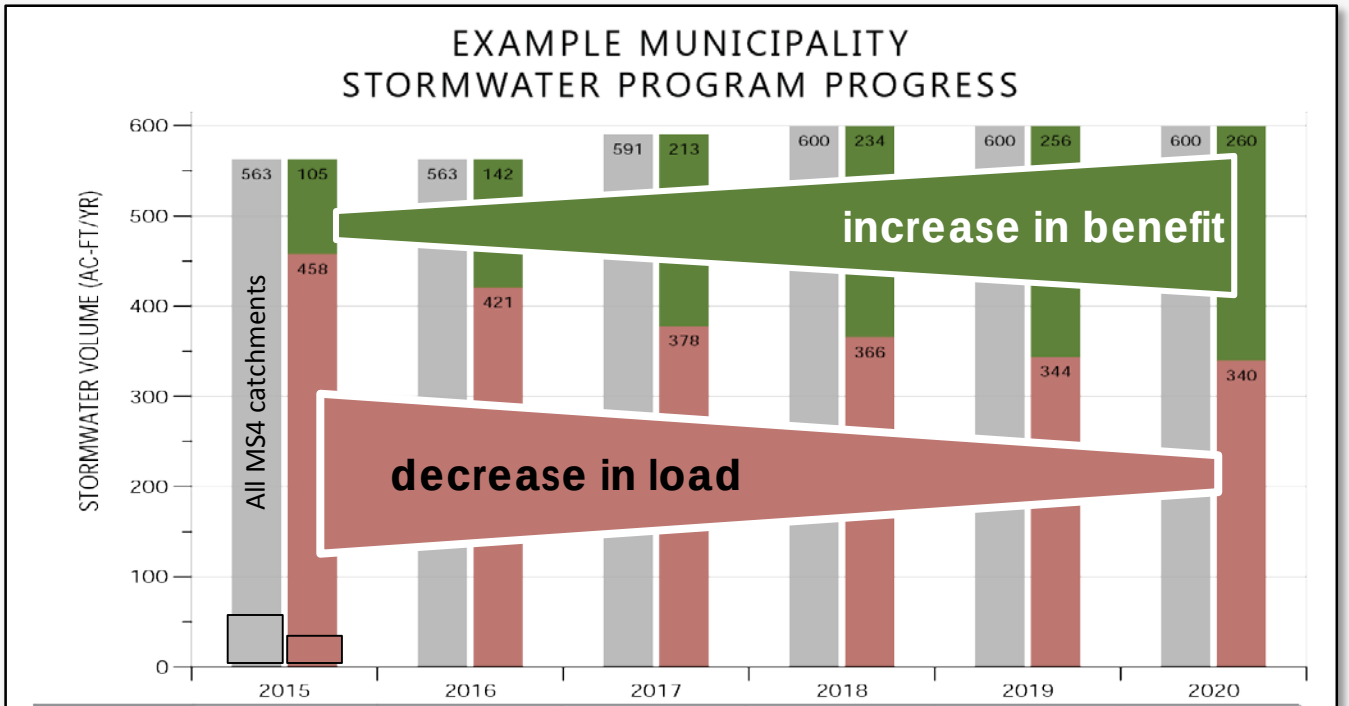
Load including **all** BMPs in catchment.

Load Reduction

= Baseline Load - Current Load

Track Stormwater Program Benefits Over Time

Automatically Generated Report



	2015	2016	2017	2018	2019	2020
Baseline Load	563	563	591	600	600	600
Current Load	458	421	378	366	344	340
Load Reduction	105	142	213	234	256	260

Baseline Load

Load **without** stormwater BMPs.

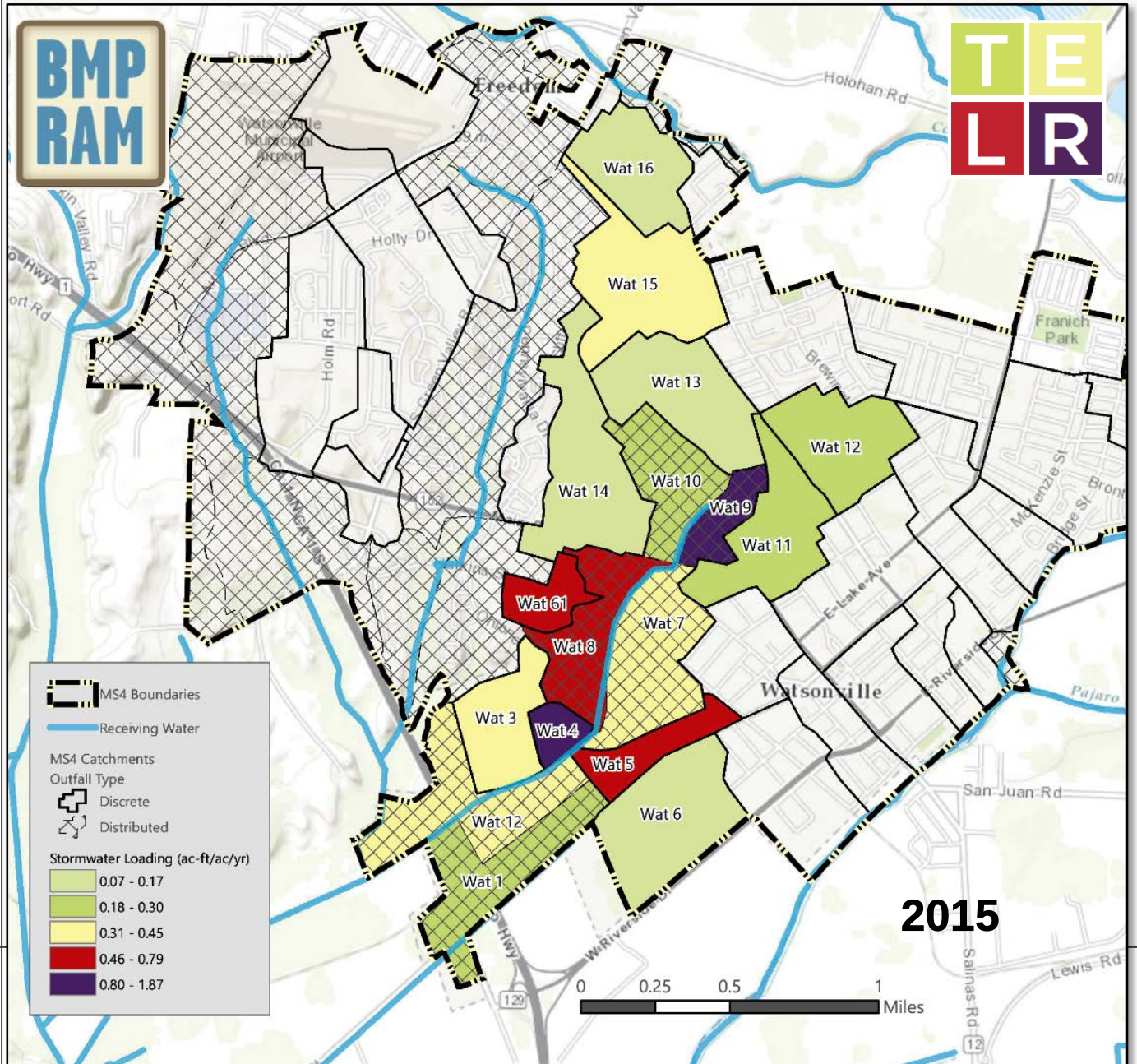
Current Load

Load including **all** BMPs in catchment.

Load Reduction

= Baseline Load - Current Load

Inform Stormwater Management Decisions



Automatically generated report

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Benefits of using approach

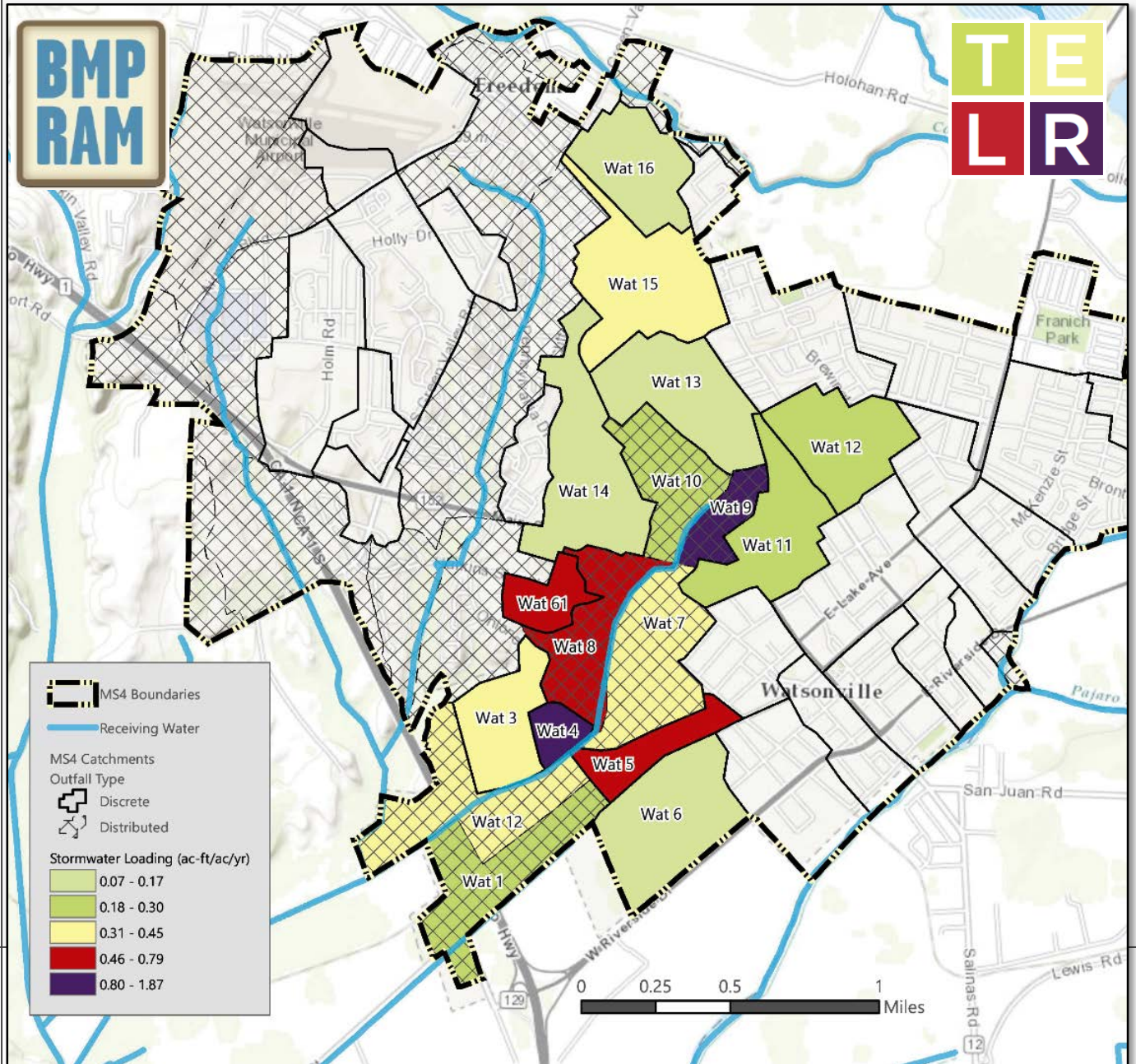
1. Common unit of measure sensitive to management actions
2. Improve communication to:
   regulators, funders, community, staff, managers
3. Applicable to any size MS4
4. Cost effective and flexible approach used by stormwater managers
5. Meet MS4 permit requirements and support TMDL objectives

Thank You

Central Coast Project Advisory Committee Members:

Agnes Topp (City of Santa Cruz)
Bridget Hoover (MBNMS)
Ellen Pritchett (City of Santa Maria)
Jackie McCloud (City of Watsonville)
Jill Murray (City of Santa Barbara)
Mary Whittlesley (County of San Luis Obispo)
Tricia Wotan (City of Monterey)
Darla Inglis (LIDI)
Alyson Tom (Santa Cruz County)
Dave LaCaro (City of Paso Robles)
Frank Lopez (rep.Cities of Gonzales & Soledad)
Jeff Condit (MRSWMP)
Mary Zepeda (rep. City of Buellton)
Terry Reynolds (Santa Cruz County)
Tom Harty (Monterey County)
Dominic Roques (RWQCB)

Q&A


BMP RAM
TELR
Wat 16
Wat 15
Wat 13
Wat 12
Wat 14
Wat 10
Wat 9
Wat 11
Wat 61
Wat 7
Wat 8
Wat 3
Wat 4
Wat 5
Wat 6
Wat 12
Wat 1
Holohan Rd
Holly Dr
Holm Rd
Franich Park
Watsonville
E Lake Ave
San Juan Rd
Lewis Rd
Salinas Rd
Pajaro
MS4 Boundaries
Receiving Water
MS4 Catchments
Outfall Type
Discrete
Distributed
Stormwater Loading (ac-ft/ac/yr)
0.07 - 0.17
0.18 - 0.30
0.31 - 0.45
0.46 - 0.79
0.80 - 1.87
0
0.25
0.5
1
Miles