ORANGE COUNTY
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San Diego Regional Water Quality Control Board
Regional MS4 Permit – Discussion on Monitoring Requirements

AGENDA
Wednesday, April 27th, 2011
10 a.m. – 12 p.m.

Location: 2301 N. Glassell St., Orange
Room: Laboratory Conference Room

I. **Welcome/Introductions**	Group	10:00-10:05
II. **Regional Permit Overview**	Regional Board Staff	10:05-10:15
III. **4th Term R9 MS4 Permit Monitoring**	County Staff	10:15-11:00
IV. **Regional Permit Monitoring Discussion**	Group	11:00-12:00

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OC Watersheds Program
County of Orange

Orange County's Monitoring and Reporting Program

Presentation to San Diego Regional Board Staff

April 27, 2011

"Monitoring is most useful when it results in more effective management decisions, specifically management decisions that protect or rehabilitate the environment"

National Academy of Sciences, 1991

Monitoring and Reporting Program Goals from R9-2009-0002

1. Assess compliance with Order R9-2009-0002;
2. Measure and improve the effectiveness of the Copermittees' runoff management programs;
3. Assess the chemical, physical and biological impacts to receiving waters resulting from MS4 discharges;
4. Characterize storm water discharges;
5. Identify sources of pollutants;
6. Prioritize drainage and sub-drainage areas that need management actions;
7. Detect and eliminate illicit discharges and illicit connections to the MS4; and
8. Assess the overall health of receiving waters.
9. Provide information to implement required BMP improvements

Designed to Answer Core Questions from R9-2009-002

1. Are conditions in receiving waters protective, or likely to be protective of beneficial uses?
2. What is the extent and magnitude of the current or potential receiving water problems?
3. What is the relative MS4 discharge contribution to the receiving water problem(s)?
4. What are the sources of MS4 discharge that contribute to receiving water problem(s)?
5. Are conditions in receiving waters getting better or worse?

4th Term Monitoring and Reporting Program Elements

- Mass Loading Stations (MLS)
- Urban Stream Bioassessment (BA)
  - Stormwater Monitoring Coalition (SMC) Southern California IBI Development
  - FW Sediment Chemistry / Toxicity Special Study
- Ambient Coastal Receiving Waters (ACRW)
  - Regional Harbor Monitoring Program (RHMP - Dana Point Harbor)
- Wet Weather MS4 Stormwater Action Levels (SALs)
- Other Regional Monitoring
  - Shoreline Microbiology (Coastal Stormdrain Outfall Program)
  - Southern California Bight Regional Monitoring

4th Term MRP Elements (cont)

- Non-stormwater MS4 Numeric Action Levels (NALs)
- Other Special Studies
  - Aliso Creek Bacti Investigation
  - Trash / Litter Impairment

Mass Load Monitoring

- Primary Purpose
  - To detect long term trends in pollutant loads
  - To determine event mean concentrations (EMCs) for estimating annual loads or total watershed loads
  - Are conditions in receiving waters getting better or worse?
- Conducted in 6 regional channels
- Streamgauges for volume measurement
- Frequency
  - 2 stormwater events – 1st storm of season meeting EPA criteria + 1 storm after February 1
    - Series of time-weighted composite samples spanning the entire runoff event
  - 2 dry-weather events at least 3 months apart between May and October
    - 24-hr time-weighted composite samples
- Analyses
  - Water chemistry and aqueous toxicity

Mass Load Monitoring Stations

Aqueous Chemistry Monitoring for the MLS, BA, ACRW, and NALs Programs

Conventional	Pesticides	Metals (tot & diss)	Bacteria
TDS	Diazinon*	Arsenic	Total Coliform
TSS	Chlorpyrifos*	Cadmium	Fecal Coliform
Turbidity	Malathion*	Chromium	*Enterococci*
Hardness	Carbamates@	Copper	
pH, SC, T, DO	Pyrethroids@	Lead	
Tot & Diss P		Nickel	
Nitrate + Nitrite		Selenium	
Ammonia / TKN		Zinc	
BOD5^ / COD^			
TOC / DOC			
MBAS / O&G			

*Analysis will also include other OP pesticides

@Initially only in Prima and Segunda Deschecha Watersheds

^The usefulness of these data will be evaluated in the 2010-11 reporting year

Toxicity Testing Specifics - MLS

	Freq	Required Tests	3rd Term Permit	4th Term Permit
Dry	2	2 chronic FW	NA	CS, SG, FHMS@
		2 acute FW	NA	CS, HS, FHMS@
		2 chronic SW*	NA	MS, SUF
Storm	2	2 chronic SW	MS, MG, SUD, SUF	MS, SUF
		1 acute SW	MS	MS
		2 acute FW	NA	CS, HS

ACRW

	Freq	Required Tests	3rd Term Permit	4th Term Permit
Dry	2	2 chronic SW	MS, MG, SUF, SUD	MS, SUF
		1 acute SW	MS	MS
Storm	2	2 chronic SW	MS, MG, SUF,SUD	MS, SUF
		1 acute SW	MS	MS

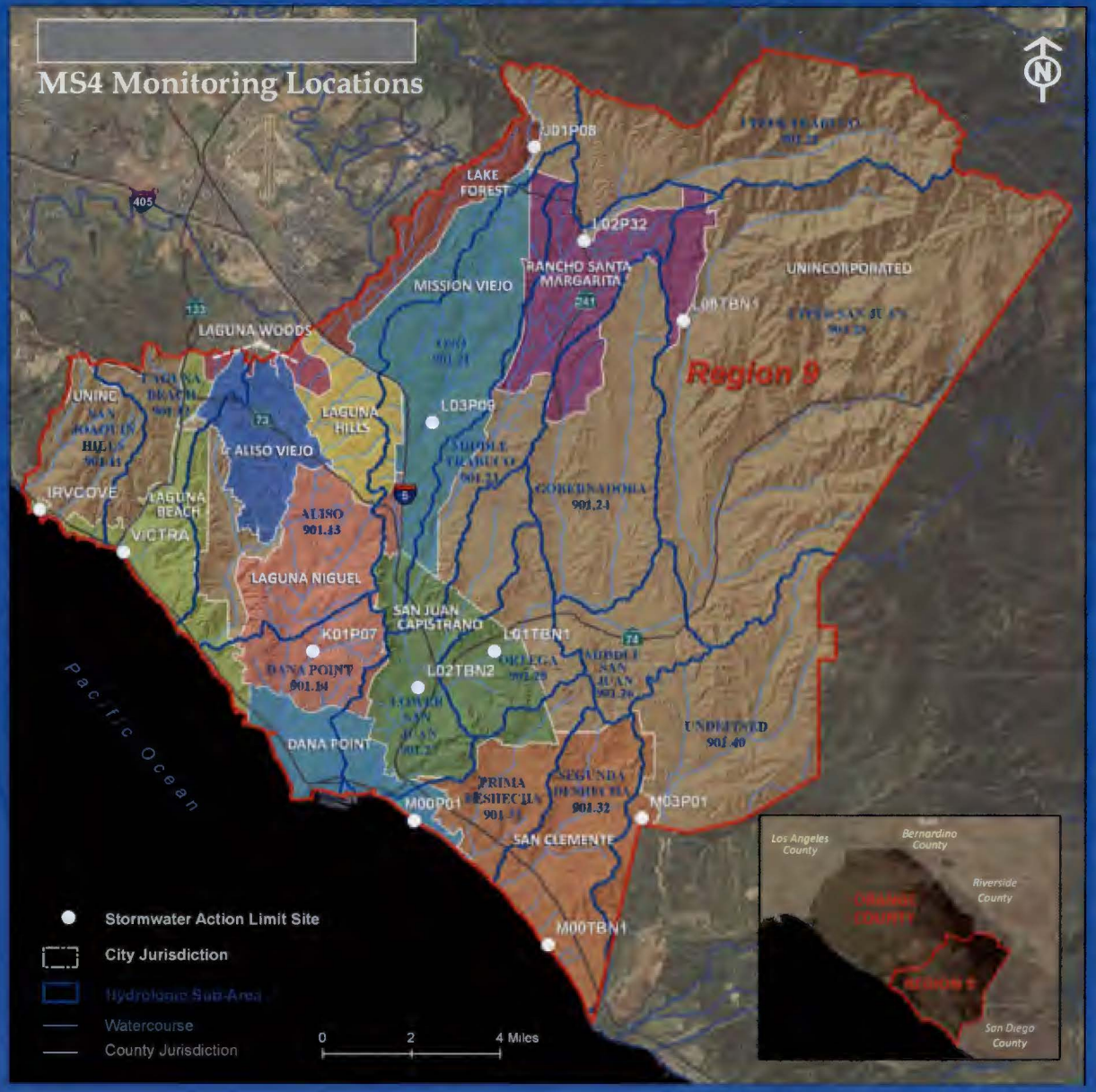
*Surfzone near outlet of Prima Deshecha only; @Aliso Creek only

CS – *Ceriodaphnia* Survival; SG – *Selenastrum* Growth; FHMS –Fathead Minnow Survival; SUD – Sea Urchin Development; SUF – Sea Urchin Fertilization; HS – *Hyalella azteca* Survival; MS – Mysid Survival; MG – Mysid Growth

Stormwater Action Level Monitoring

- Primary Purposes and Question Addressed
  - Prioritize drainage and sub-drainage areas that need management actions
  - To detect and eliminate ID/ICs to the MS4
  - What is the relative MS4 stormwater discharge contribution to the receiving water problem(s)?
- 1 randomly selected stormdrain (major outfall) from each hydrologic subarea (HSA). Other sites will be added once evaluations are completed at initial sites.
- Selection Criteria
  - Stormwater conveyance structure must be composed of reinforced concrete or corrugated metal pipe with no upstream earthen component
  - Dimensions must meet EPA sizing criteria for major outfalls
  - The major outfall must discharge to waters of the United States
- Frequency – 2 representative storms/year

SALs Locations



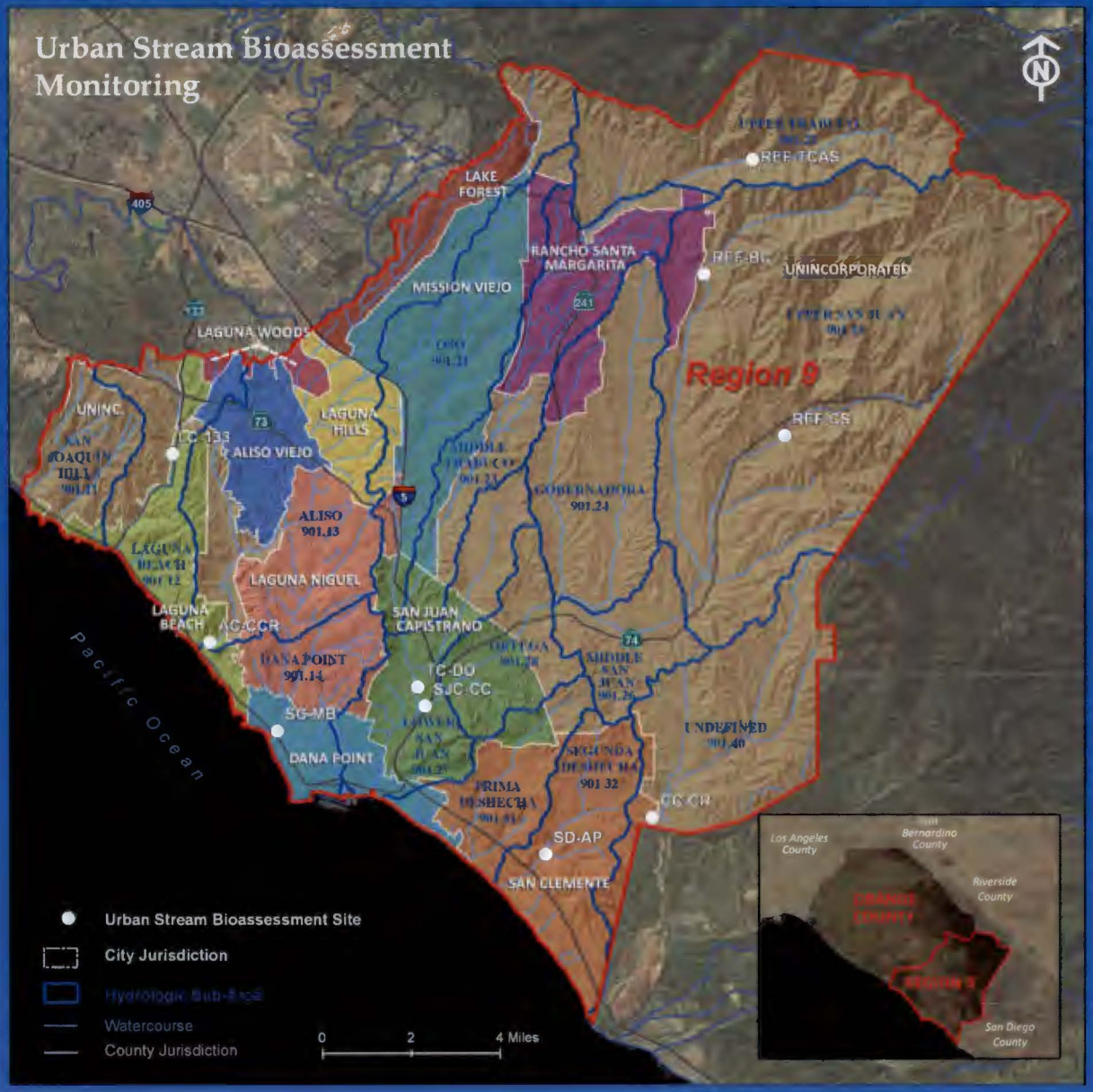
Aqueous Chemistry for SALs Program

Constituents	Type	Location
Turbidity	≤24 hr composite	Stormdrain discharge
Nitrate + nitrite, total phosphorus	≤24 hr composite	Stormdrain discharge
Total Metals (Cd, Cu, Pb, Ni, Zn)	≤24 hr composite	Stormdrain discharge
Water Hardness	grab	Receiving water if FW

Bioassessment Monitoring

- Primary Purpose and Question Addressed
  - Assess the overall health of freshwater urban streams and channels using a multiple lines of evidence (MLE) approach
  - Are conditions in these water bodies protective or likely to be protective of beneficial uses?
- At least 1 site in each Watershed Management Area, 3 reference sites, and new sites each year for the SMC's Southern California Regional IBI development
- Benthic macroinvertebrate (BMI) collection using SWAMP protocols + SWAMP algae assessment (taxonomy and biomass)
- Samples for water chemistry and aqueous toxicity (48-hr/7-day *Ceriodaphnia* survival, 96-hr *Hyalella* survival, 96-hr *Selenastrum* growth)
- Sediment chemistry / toxicity for 2-year special study at 4 sites including 1 ref site

Bioassessment Locations



Ambient Coastal Receiving Waters Monitoring

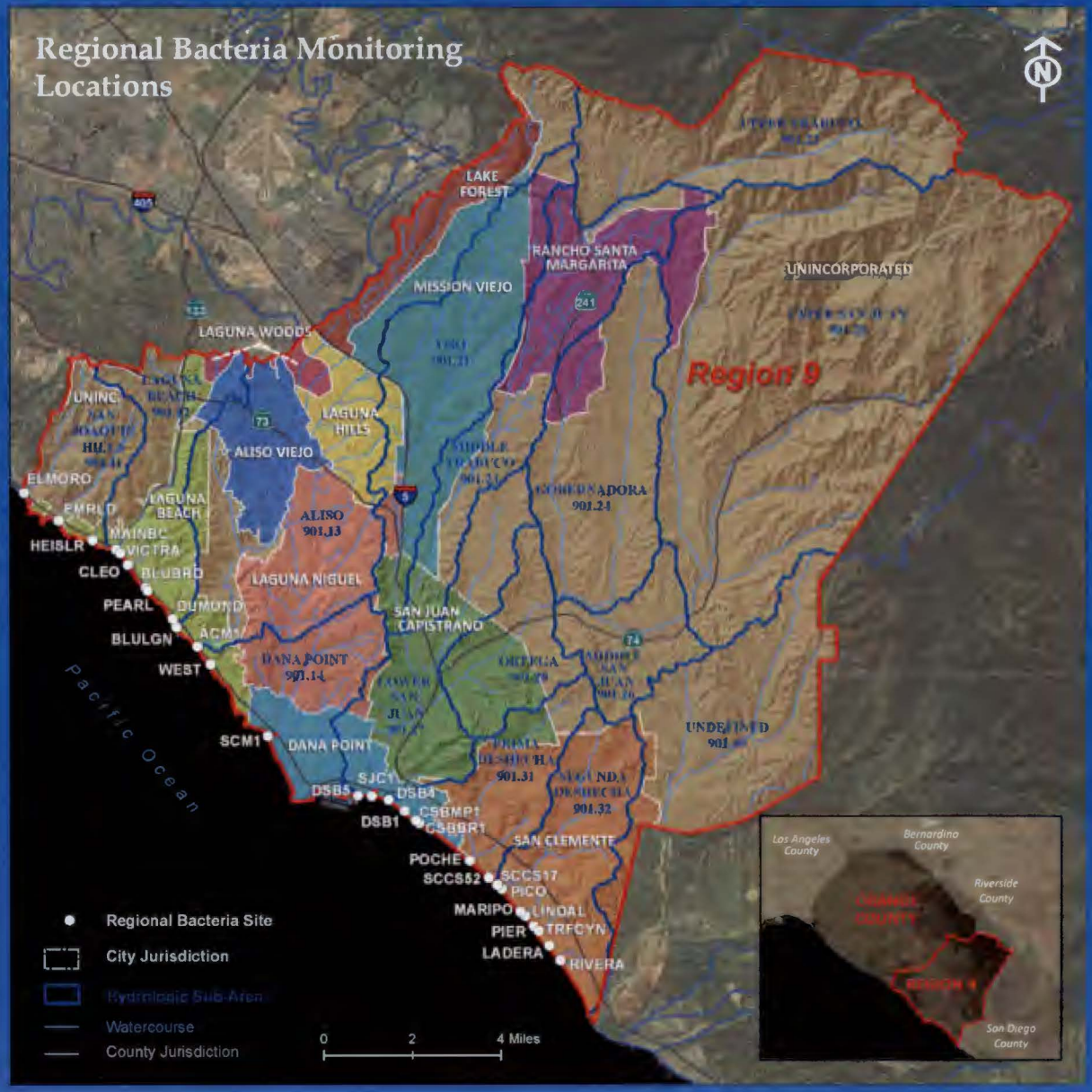
- Primary Purpose and Question Addressed
  - Assess the chemical, physical, and biological impacts to coastal receiving waters resulting from dry weather and stormwater discharges from the MS4
  - Are conditions in coastal receiving waters protective or likely to be protective of beneficial uses?
- Conducted in ecologically sensitive receiving waters of coastal stormdrains
- Dana Point Harbor monitored as part of Regional Harbor Monitoring Program (RHMP)
- 2 stormwater and 2 dry-weather samplings per year
- Aqueous chemistry and toxicity

ACRW Locations

Regional Shoreline Bacteria Monitoring

- Primary Purposes and Question Addressed
  - Assess potential impacts to public health from water contact recreation in receiving waters of coastal stormdrains during dry weather.
  - Prioritize drainage and sub-drainage areas that need management actions.
  - Are conditions in receiving waters protective, or likely to be protective of beneficial uses?
- Shoreline microbiological monitoring conducted in collaboration with SOCWA and OCHCA
- Weekly dry-weather sampling of stormdrain discharge (no sample if diverted) and surfzone receiving waters (upcoast and downcoast)
- Fecal indicator bacteria: total coliform, fecal coliform, and *Enterococci*
- Temperature (stormdrain and surfzone), flow estimate

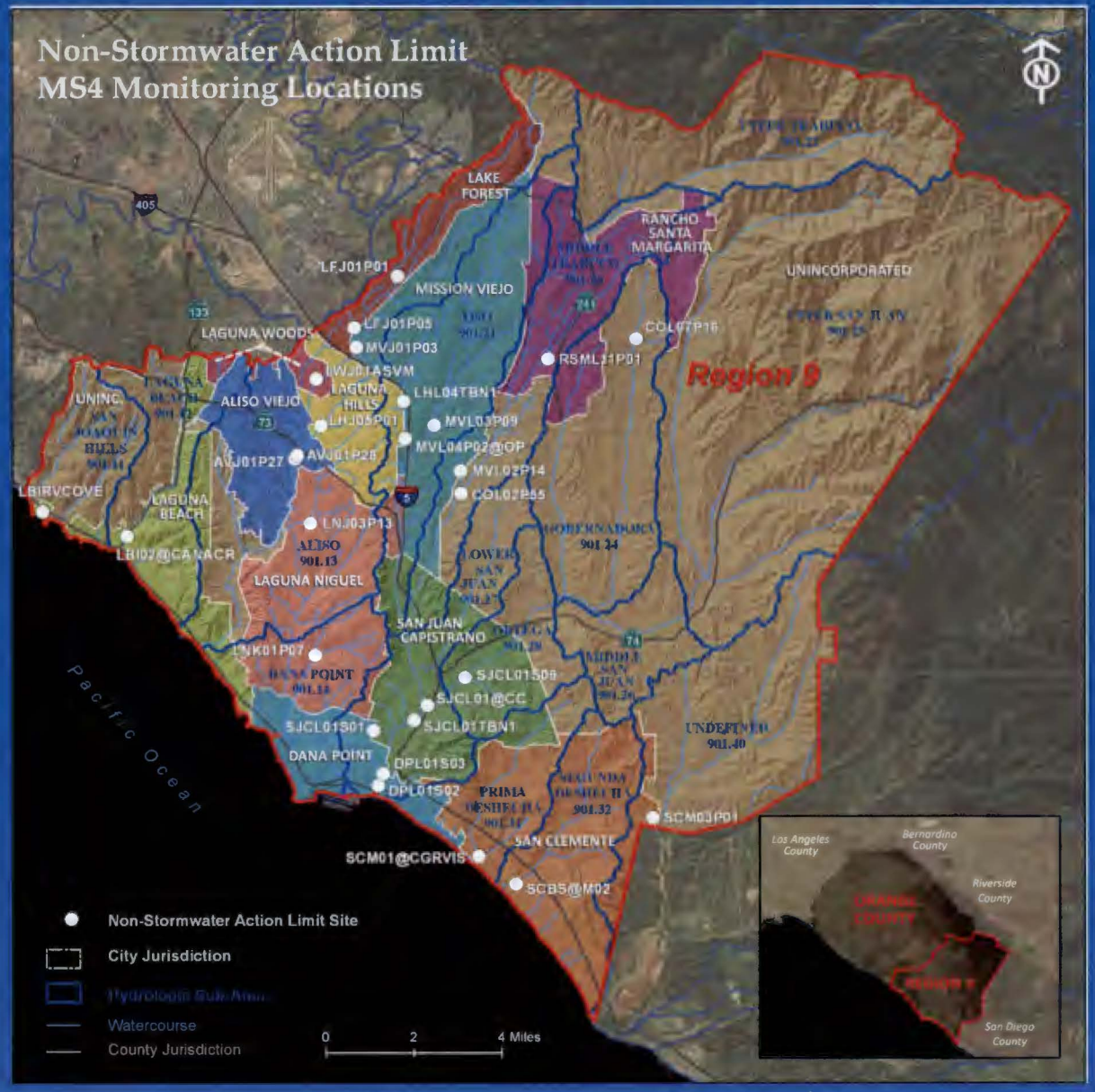
Regional Shoreline FIB Locations



Non-stormwater Action Level Monitoring

- Primary Purpose and Question Addressed
  - Detect and eliminate ID/ICs to the MS4
  - Prioritize drainage and sub-drainage areas that need management actions
  - What are the sources of MS4 discharge that contribute to receiving water problem(s)?
- Targeted drains from 3rd Term Permit DW Reconnaissance Program + randomly selected drains in unrepresented HSAs
- Drain must discharge to receiving water
- One sampling during dry-season (May – Sept) and one sampling during wet season (Oct – April)
- NALs Constituents
  - Fecal Coliform, *Enterococci*, Turbidity, pH, DO, TN, TP, MBAS, total recoverable metals (Cd, Cr, Cu, Ni, Ag, Zn)
  - Hardness in receiving waters
- MLS Chemical Constituents (see prior table)
- Additional Analyses
  - Human specific bacteriodes for microbial source tracking
  - DWRP field measurements (NO_3, NH_3, total Cl_2, ortho-PO_4)
  - Receiving water monitoring (u/s and d/s of discharge) for NALs constituents

NALs Locations



Region 8 vs Region 9 MRP for OC

Region 8	Region 9
Area - 481.6 mi^2; Population – 2.6 million 2010/11 Monitoring Costs - $1.217 million Monitoring year: Jul 1 – Jun 30 Annual report due date: Nov 15	Area – 202.2 mi^2; Population – 0.553 million 2010/11 Monitoring Costs - $1.024 million* Monitoring year: Oct 1 – Sep 30 Annual report due date: Oct 1
Mass Emissions: 11 sites – 3 ST, 3 DW; 1st storm of season includes priority pollutants	Mass Loading: 6 sites – 2 ST, 2 DW
Bioassessment: 12 sites + SMC IBI sites	Bioassessment: 10 sites + SMC IBI sites
Pathogen Monitoring: 9 coastal sites, 6 regional channels, weekly	Coastal Stormdrain Outfall Program: 26 coastal sites, weekly when safely accessible
Estuary, Wetlands: 20 sites – aqueous chemistry, toxicity; sediment toxicity/benthic infaunal assemblage	Ambient Coastal Receiving Waters: 14 sites – aqueous chemistry, toxicity
None	Wet Weather MS4 Monitoring (SALs)* (not included in 2010/11 costs)
Dry Weather MS4 Reconnaissance: 50+ sites, 3-5 times May – Oct, source ID triggered by exceedance of upper bound of regional tolerance interval statistic	Non-Stormwater MS4 Numeric Action Levels (NALs)* – 26 sites, 1 sample May-Sep, 1 sample Oct-Apr, source ID triggered by NAL exceedance (not included in 2010/11 costs)
Newport Bay Trash Management Plan	Trash and Litter Impairment Assessment***(not included in 2010/11 costs)**

Summary

- The current monitoring levels in south Orange County are excessive relative to differences in land areas and populations between regions.
- The County is seeking uniformity of monitoring across the County, in both permit regions.
- Monitoring should be conducted to achieve specific goals and to answer specific questions
- Once the goals are achieved and those questions are answered resources should be directed to new areas.