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OC PublicWorks
Our Community, Our Commitment

SMC Regional Stormwater Monitoring Comparison and Evaluation

Water Quality Sampling

COUNTY OF ORANGE CALIFORNIA

Orange County's Program

- San Diego and Santa Ana RWQCB
- Term 2009-2014
- Most monitoring plan details prescribed in permit

Description	Wet weather sites	Min. storm events per site per year	Storm events needed per year	Dry weather sites	Dry events needed per year
Mass Loading	17	2-3	8	4	2
Receiving Water	18	2	6	6	2
MS4	12	2	2-8	25	1

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Site selection

- Mass Loading (ML)
  - End of watershed (20-50yrs+ trend)
  - Measure cumulative impact of all MS4 inputs
- Receiving waters (RW)
  - Harbors, estuary, wetlands, and ocean MLR downstream of watershed location
- Urban outfalls (MS4)
  - Constrain, as feasible, to copermittee MS4 contributions
  - Avoid upstream RW commingle
  - Physical site constraints
    - Discharge velocity < autosampler pump rate

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Sampling

- Time-weighted composites
  - ML, 1st flush and duration of storm event
  - MS4, duration of storm or 24 hours
  - Dry weather, 24 hour or composite grabs
- ISCO 6712 autosamplers
  - Synchronized for chemistry and toxicity
  - 1.8L and 38L glass bottles
- Grab samples for bacteria, O&G, COD, cBOD
- pH, DO, Conductivity, Temperature

Sampling

- Receiving waters
  - BIGHT protocol
    - Harbors, estuary, wetlands,
      - 1-3 days in duration by boat and shoreline
    - Surfzone
      - Within 24 hours of storm event
  - Chemistry and toxicity
    - Composite grab
      - Surface and depth integrated

Sampling

- San Diego Region (SDR)
  - MS4
    - Concentration based action levels
      - Follow up sample to confirm/deny persistent problem
    - Frequency
      - Minimum 2x/year
      - Actual events = 2-8x/year
        - Equipment malfunction or false starts
        - Source identification w/in same storm season

Season summary

- Storm season, Sept. 1st to May 30th
  - 1st storm of season required in both permits
    - Early season weather forecast tenuous,
      - Need increased season to catch early storm
    - Requires pre-planning, coordination, and strong attention to detail
      - Maximum 11 sites feasible
  - Need minimum 10 storms per year to meet permits
  - Need to sample every storm event > 0.1”
    - Mass Loading and RW, prefer > 0.25”
    - MS4, everything else

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Season summary

- Storm Coordinator
  - Follows weather and makes go/no-go decision
    - Organizes 3 to 6 two-person teams per storm
    - Separate runner(s) to check 1st day autosampler progress

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Season summary

- Rotating monitoring effort
  - County divided into north, central, south regions
    - Regional efforts to minimize travel and staff dispersion
    - Avoid program cross-over to eliminate/minimize error
- Coupled Programs
  - Mass Loading and Receiving Waters program monito simultaneously
    - Compare discharge with impact rather than extrapolate to expected RW condition

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Sampling Logistics

- Front load effort early in season
  - Avoid missing storms
    - Storm season intensity forecasts historically not reliable
  - Extra staff not available during annual report period and holidays
  - Increased staff fatigue/increasing flu rates by end
    - Increased chances for errors with season duration

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Typical Storm Season Schedule

	Storm Event and Monitoring Programs											
Regions	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th
South	6 ML								6 ML			
					6 RW				6 RW			
		6 MS4	6 MS4		6 MS4	6 MS4				X MS4	X MS4	X MS4
Central	3 ML			6 ML			6 ML					
				5 RW			5 RW					
North	2 ML					5 ML		5 ML				
						6 RW		6 RW				

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