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# FY05 Oso Creek/Oso Bay Project

## Bacteria (Enterococci) Monitoring



Oso Creek/Oso Bay TMDL  
Stakeholders Meeting

August 23, 2005

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Physical and Life Sciences

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# Bacteria

- **Bacteria are everywhere, thousands of species**
- **More kinds of bacteria in our mouth than in rainforest**
- **Not all bacteria are “bad” – pathogens – many are important to our survival**
- **In the environment – soil, water - important in cycling nutrients e.g. N, P, breaking down organic material, food source for other organisms (food chain) etc.**

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# Bacteria

- **Bacteria are NOT viruses**
- **Not all pathogens are bacteria – viruses, protozoans and fungi can also cause disease**

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# Vibrio

- *Vibrio* is not a virus
- It is a group (genus) of bacteria normally found in aquatic environments.
- Some *Vibrio* spp. can cause human disease e.g. cholera, wound infections

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# Bacteria

- **Water quality standards use bacteria found normally in the intestinal tract to indicate there has been some fecal contamination**
- **This suggests other organisms normally found in fecal material are in the water. Some of these can cause disease**

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# Bacteria

- **Organisms often found in water which originate in feces and can cause disease include:**
  - ***Cryptosporidium, Giardia* - protozoan parasites, passed in feces of infected humans/animals**
  - ***Salmonella, Shigella, E. coli 0157* - bacteria**
  - **Norovirus, other viruses cause diarrhea etc**



# Reference web sites

<http://www.cdc.gov/healthyswimming/>

- General info on Recreational Water Illnesses (RWIs), fact sheets on organisms, diseases, sources etc.

<http://www.epa.gov/ebtpages/watewaterqualitymonitoring.html>

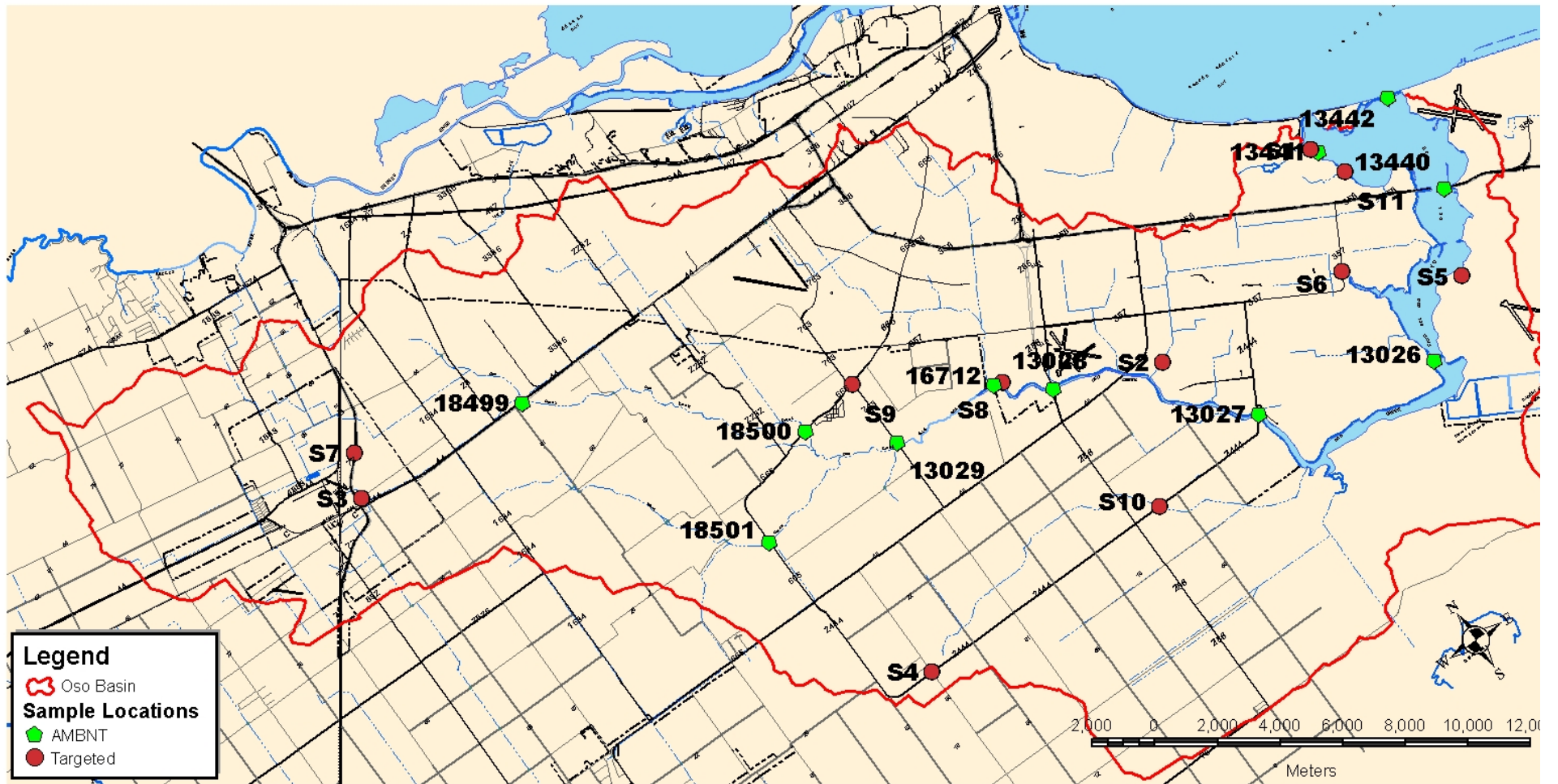
- Regulatory info, info on *Crypto*, *Giardia*, *Legionella* etc.



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# Sampling Stations

- **Ambient (11)**
  - Historical
  - Representative of bay/creek system
- **Source Assessment (after rainfall) (11)**
  - Based on sanitary survey



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# Sampling Frequency

- **Ambient:**
  - Weekly May 19 - present
  - After rainfall event June – 3 times (approx. 24 hr intervals)
- **Targeted:**
  - After rainfall event – 3 times (approx. 24 hr intervals)

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# Sampling Parameters

- **Water for bacteria analysis – enterococci (two samples per station)**
- **Field observations**
- **Field physicochemical parameters:**  
**(*SWQM Proc., Vol 1 (RG-415, Dec. 2003)*)**
  - **By Multiprobe Instrument:**
  - **Secchi disk transparency**
  - **Instantaneous flow measurement or flow estimates**

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# Bacteria Analysis- Enterococci

- Indicator of fecal contamination
- Recommended by EPA (1986)
- Standard EPA Method 1600
- Proposed WQS SS criteria: (EPA)
  - 158 cfu/100 ml for moderate recreation use
  - 104 cfu/100 ml for high recreation use

# Dry Weather Weekly

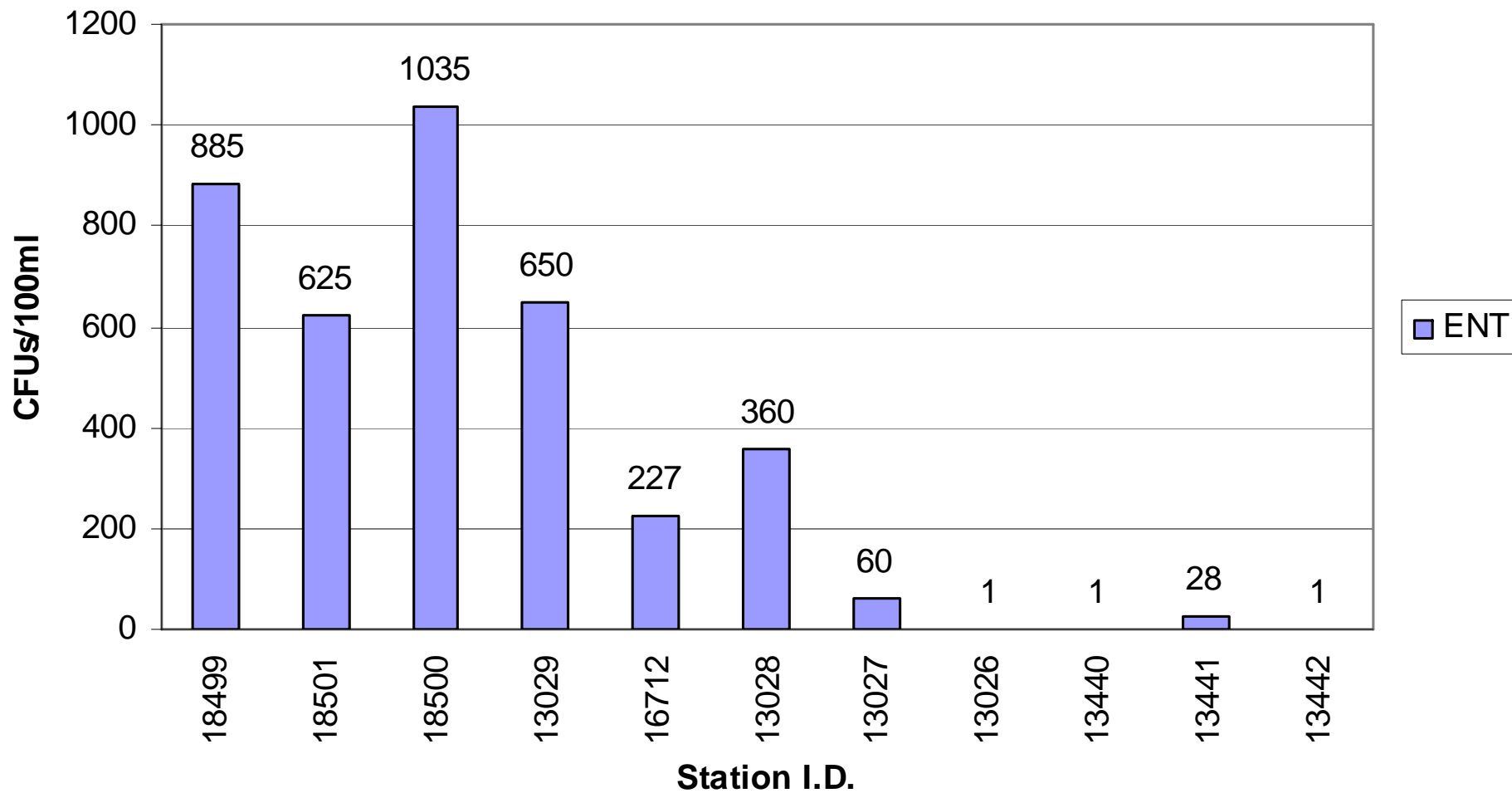
	5/19/05	5/26/05	6/9/05	6/16/05	6/23/05	6/30/05
18499	290	665	520	885	780	1160
18500	555	620	755	1035	1240	1360
18501	300	420	1490	625	1170	995
13029	375	585	455	650	795	540
16712	350	140	310	227	430	415
13028	295	105	32	360	550	550
13027	160	17	72	60	54	154
13026	3	1	7	1	3	1
13440	15	1	3	1	1	1
13441	39	40	27	28	1	445
13442	1	2	4	1	5	1

# Dry Weather Weekly\*

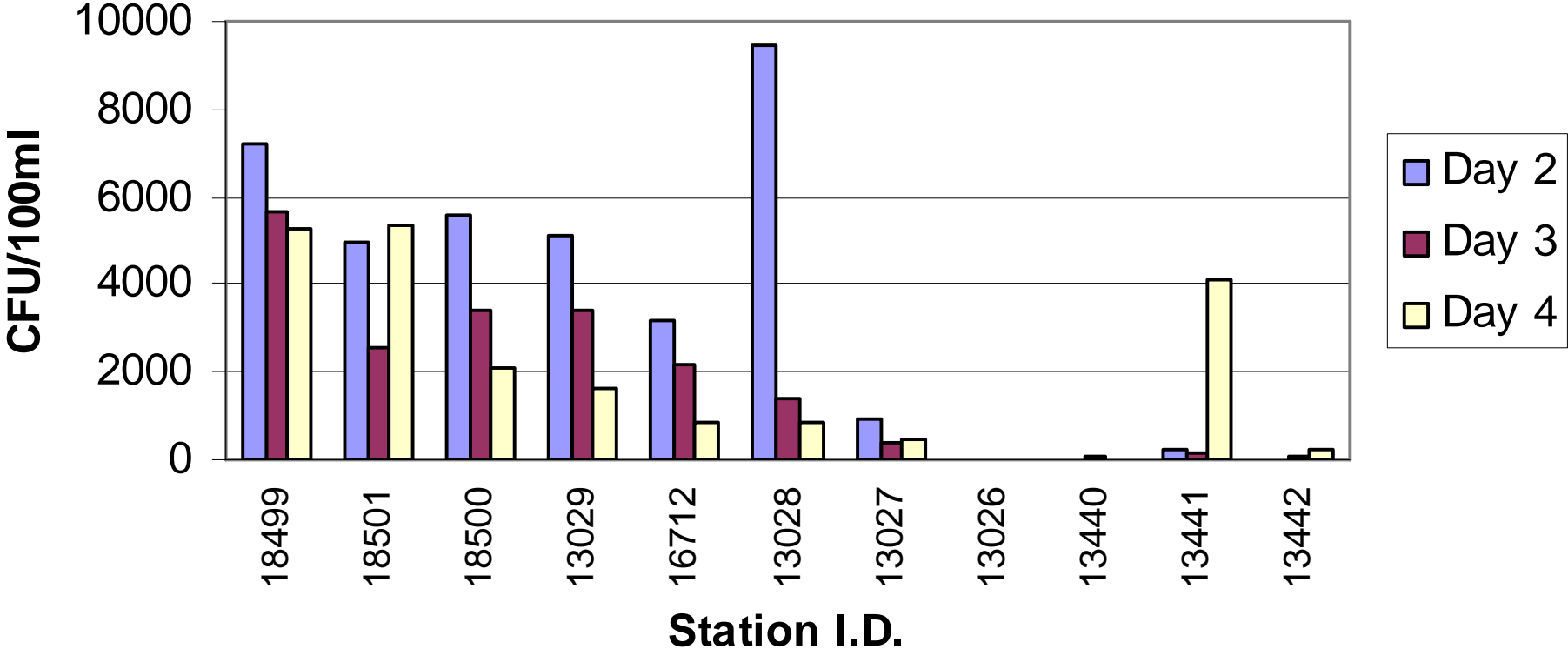
	7/7/05	7/14/05	7/21/05	7/28/05	8/4/05	8/11/05
18499	745	1100	1467	1475	2025	573
18500	1370	845	1925	730	915	595
18501	1860	1930	4450	2860	485	588
13029	1110	1495	1850	720	480	685
16712	170	365	1033	255	430	695
13028	1100	2545	834	167	250	195
13027	51	530	157	10670	16500	6850
13026	1	1	54	1	1	2
13440	1	1	4	12	1	39
13441	129	320	129	130	680	110
13442	1	1	25	2	2	7



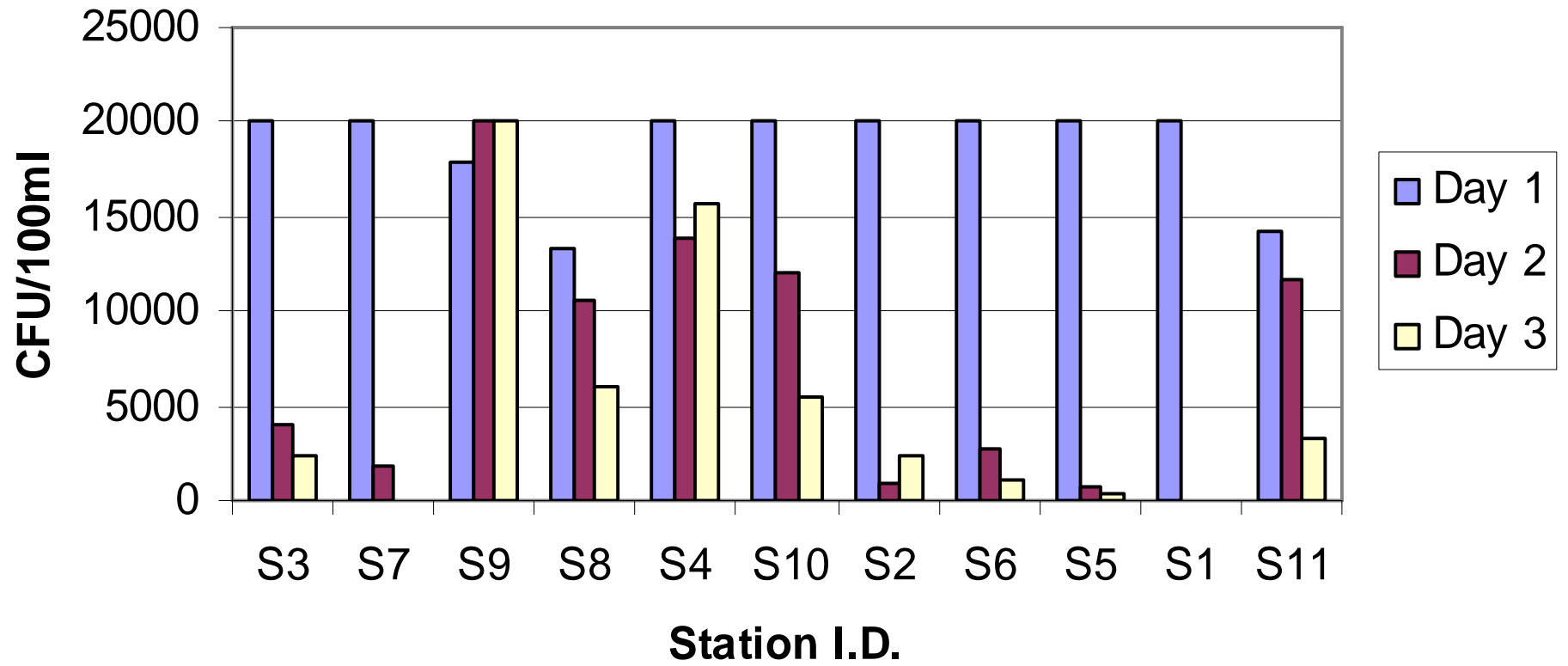
## Event 6/16/05 Stream Order



# Rain Event Ambient Stations



## Rain Event Targeted Stations



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# Year 2 Sampling Plan

- **Continue with same stations**
- **Frequency of sampling based on needs of model development**

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# Sampling Frequency

- **Ambient stations: Sept-April**
  - Weekly for 4 weeks during cold weather (January ?)
  - Weekly for 4 weeks during bird migration (Nov/Dec)
  - Monthly for other months (Sept – April)
  - 3 rainfall events 5 days of sampling
- **Targeted**
  - 3 rainfall events 5 days of sampling

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• **QUESTIONS ??**

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## Ambient – Oso Creek

- 18499 Oso Creek at SH 44
- 18501 W. Oso Creek at SH 665
- 18500 Oso Creek at SH 665
- 13029 Oso Creek SW of CC (FM 763)
- 16712 Oso Creek W of SH 286 (Elliott Landfill)
- 13028 Oso Creek South of CC (SH 286)
- 13027 Oso Creek at FM 2444 S of CC
- 13026 Oso Creek at Yorktown Bridge

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# Oso Bay

- 13440 Padre Island Drive (SH 358)
- 13441 Hans Suter
- 13442 (Ocean Drive) CC Bay

# Source Assessment

- **Downstream from WWTPs**
  - Oso Bay adjacent to Oso WWTP discharge (S1)
  - Robstown at SH 77 (WWTP ditch) (S7)
- **Landfill runoff – Elliot landfill (S8)**
- **Rural community**
  - Rose Acres ditch SH665 (S9)
  - London community (animal) 2444 nr SH286 (S4)

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# Source Assessment

- **Urban storm water run-off**
- **Waste water treatment plants**
- **Rural communities**
  - **Septic systems**
  - **Colonias**
- **Animal (Livestock) – other sources**  
e.g. pet waste, bird
- **Agriculture**

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- **Livestock**
  - Glen Oak ditch (Flour Bluff) (S5)
- **Urban runoff**
  - Cedar Pass ditch (S2)
  - Rodd Field ditch (S6)
  - CR 40 near US 77 ditch (S3)
- **Agriculture**
  - CR 55 near 2444 (S10)
- **Oso golf course (S11)**

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# Sampling Parameters

- **Water for bacteria analysis – enterococci (two samples per station)**
- **Field observations**
  - visual appearance of the water
  - water use
  - weather
  - flow severity
  - days since last precipitation event - NWS data.

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**– Field physicochemical parameters:  
(*SWQM Proc.*, Vol 1 (RG-415, Dec. 2003))**

- **By Multiprobe Instrument:**
  - dissolved oxygen (PC 00300)
  - water temperature (PC 00010)
  - specific conductance (PC 00094)
  - pH (PC 00400)
  - salinity (PC 00480)
- **Secchi disk transparency (PC 00078)**
- **Instantaneous flow measurement (PC 00061) (not at tidal stations).**
- **Flow estimates if field conditions do not allow for flow measurement (PC 74069).**