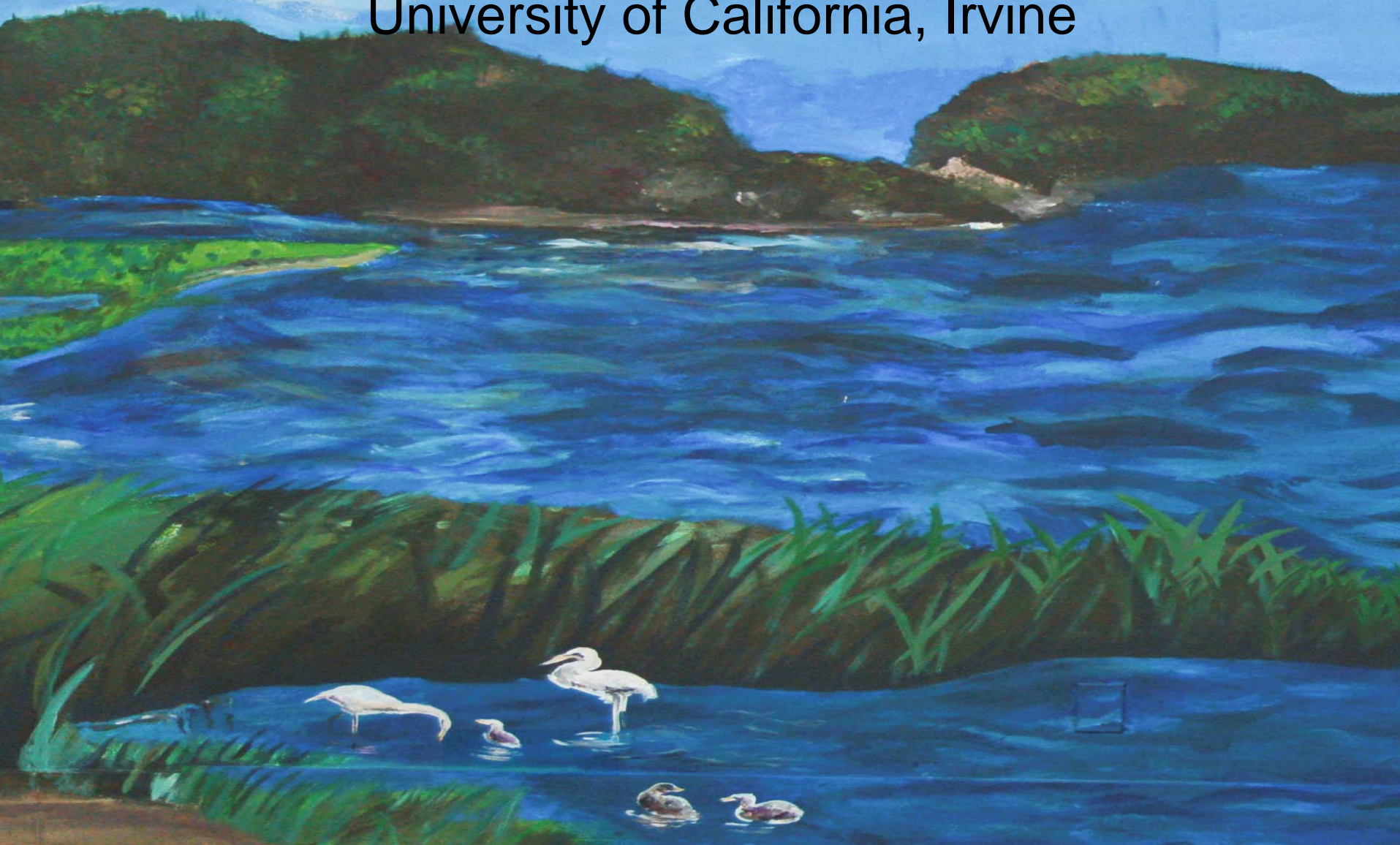


Stanley B. Grant's Research Group
Chemical Engineering and Materials Science
University of California, Irvine



Grant Lab Research Effort

Utilize the tools of modern engineering-science to:

- (1) Identify the ecological and transport factors that contribute to urban coastal pollution (focus on pathogens, particles and nutrients).
- (2) Design optimal best management practices for pollution mitigation.

Motivation: recreational water quality

Sewage or urban runoff

mixing

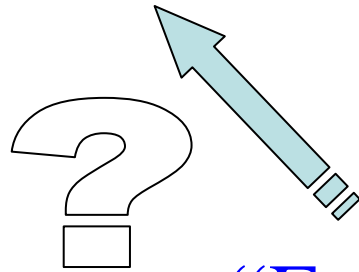
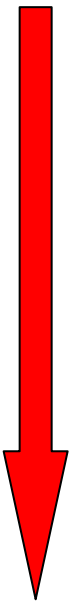
exposure



Human illness (GI and respiratory)

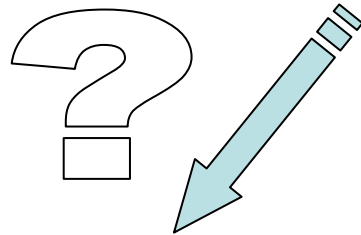
Sewage/runoff

Fecal/oral pathogens + “other stuff”



“Fecal indicator bacteria (FIB)”

(total coliform, fecal coliform, enterococci bacteria)



Human illness



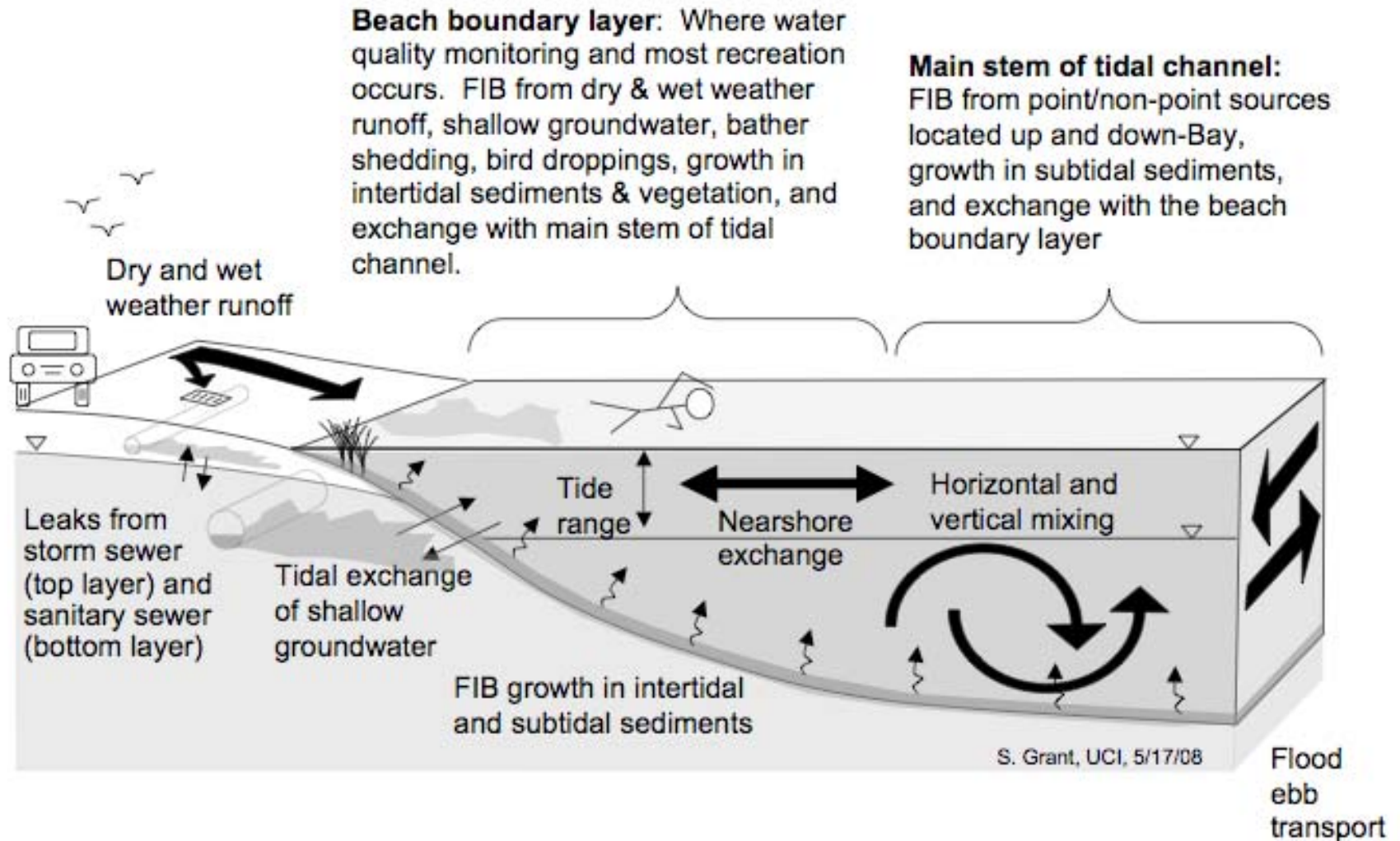
Regulatory Focus

Top five causes of water quality impairment in the US

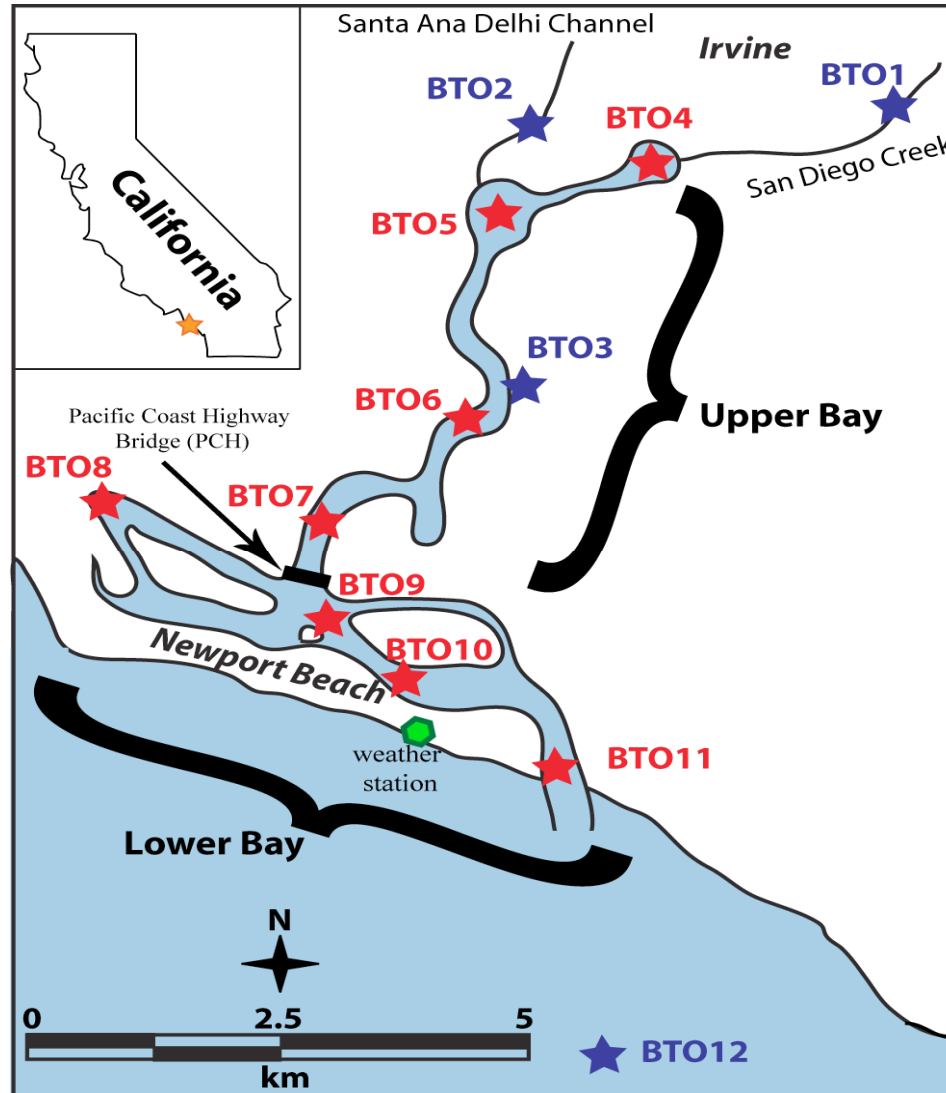
(EPA 303(d) listings, 1996-2006)

<i>Reason for impairment</i>	<i>Number of Total Maximum Daily Loads</i>
Heavy metal pollution	3936
Microbial pollutants and pathogens	3603
Nutrients	2198
Sediments/siltation	1709
Organic enrichment, dissolved oxygen	1264

Conceptual Model: Beach Boundary Layer Model (BBLM)



One of our field sites in southern California





Former graduate Students and Post-docs

- Harold Walker (now Professor CEE, Ohio State U.)
- Alexandria Boehm (now Professor CEE, Stanford)
- Jeremy Redman (now Professor CEE, CSULB)
- Joon Ha Kim (now Professor CEE, KGIST)
- Younsul Jeong (now Consultant, Everest)
- Cris Surbeck (now Professor CEE, U of Mississippi)
- Karen McLaughlin (now Researcher, SCCWRP)
- Abhishek Pednekar (now Consultant, Worley Parsons)
- Jong Ho Ahn (now Researcher, Korea Environment Institute)

Current graduate students and post-docs

- Rachel Litton
- Lin Ho
- Morgan Bailey
- Janice Lin

Funding

- California State Water Resources Control Board
- State of California Clean Beaches Initiative
- County of Orange
- County of Riverside
- County of San Bernadino
- City of Avalon
- National Science Foundation (Cyberinfrastructure)
- National Water Research Institute