

Impacts of Urban Runoff on a Pristine Southern California Stream

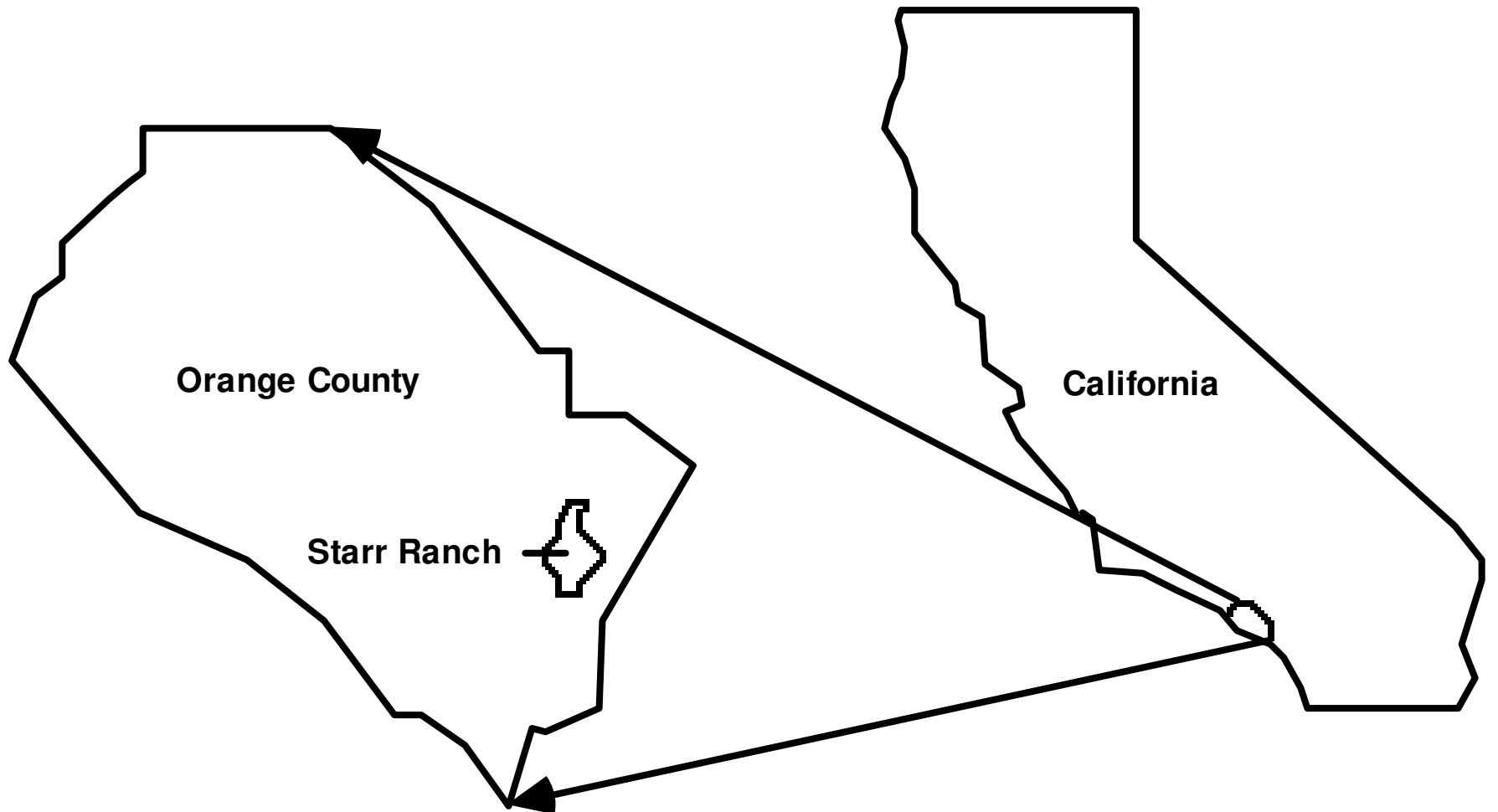


Audubon's Starr Ranch Use of
Macroinvertebrates to Assess Water Quality

IURPSCS



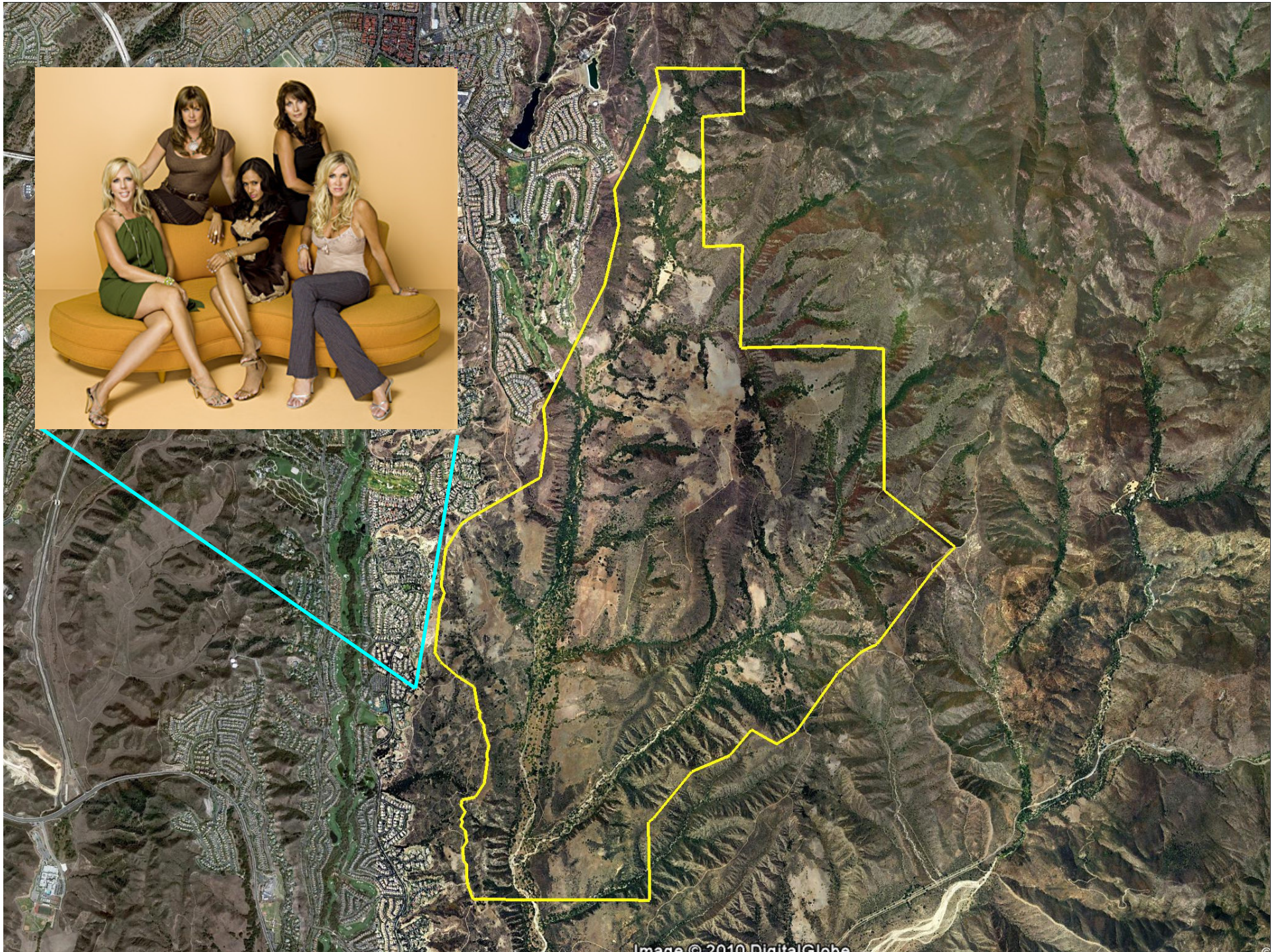
Audubon's Starr Ranch Use of
Macroinvertebrates to Assess Water Quality





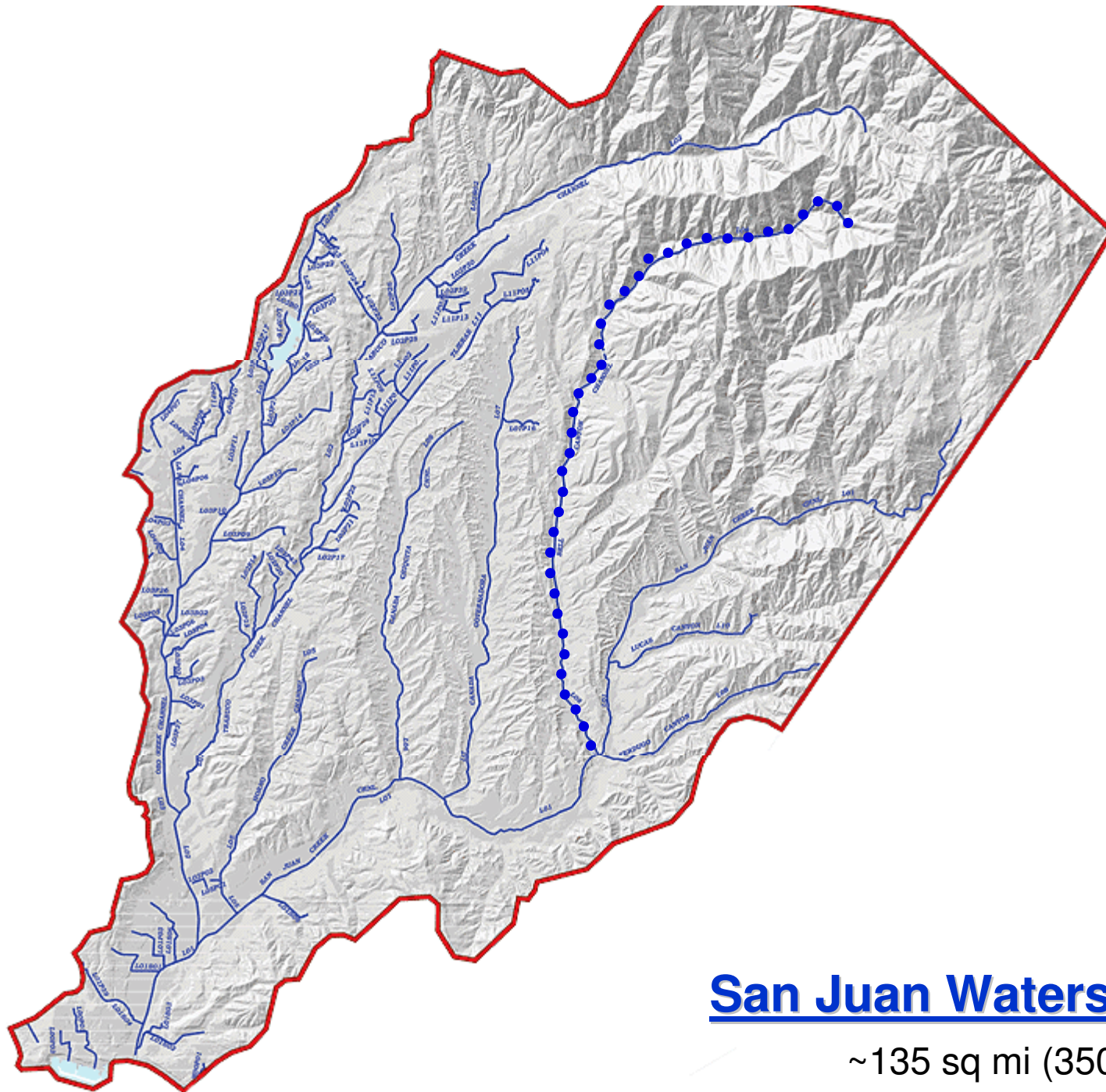










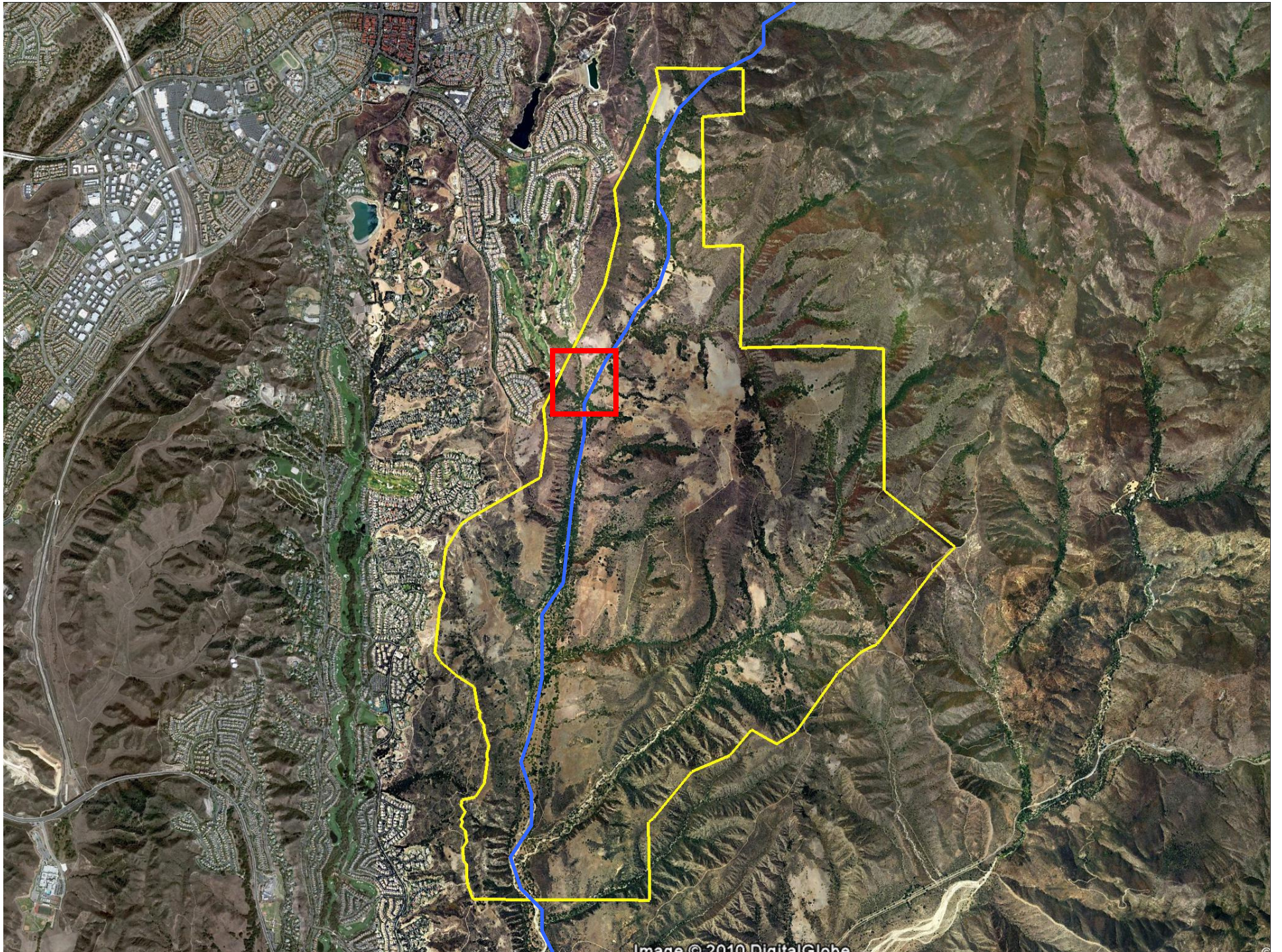


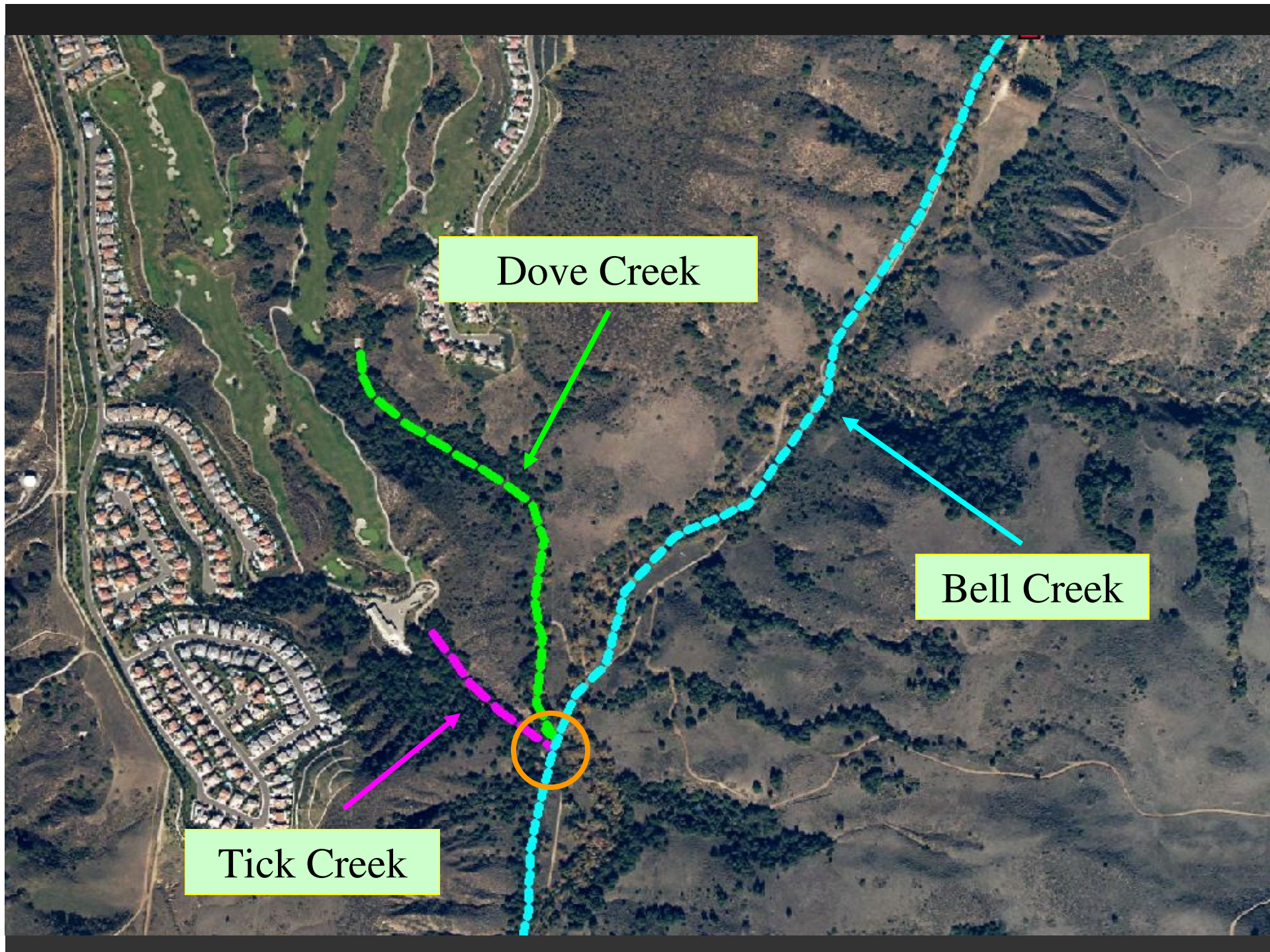
Pacific Ocean

San Juan Watershed

~135 sq mi (350 km²)



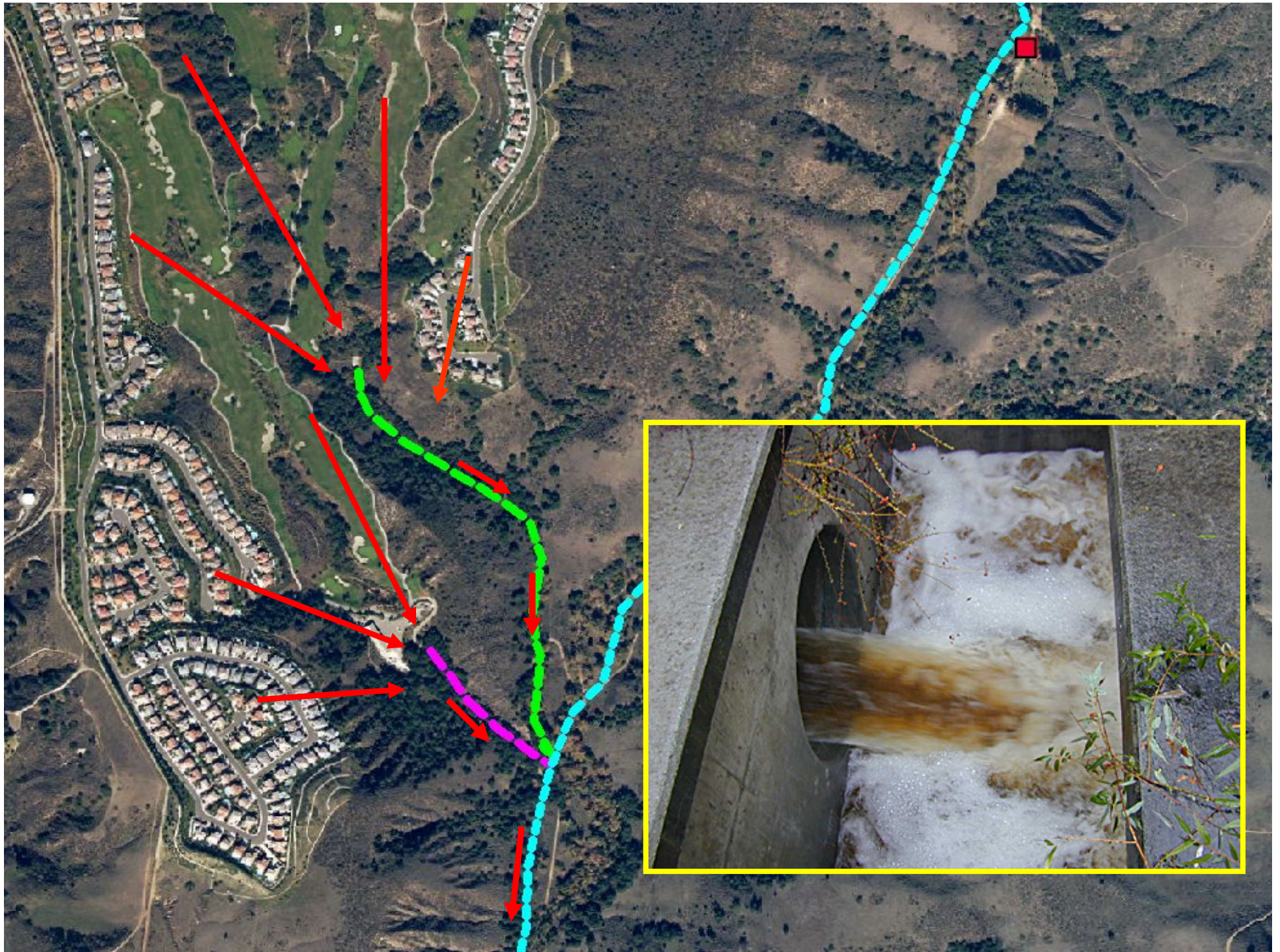




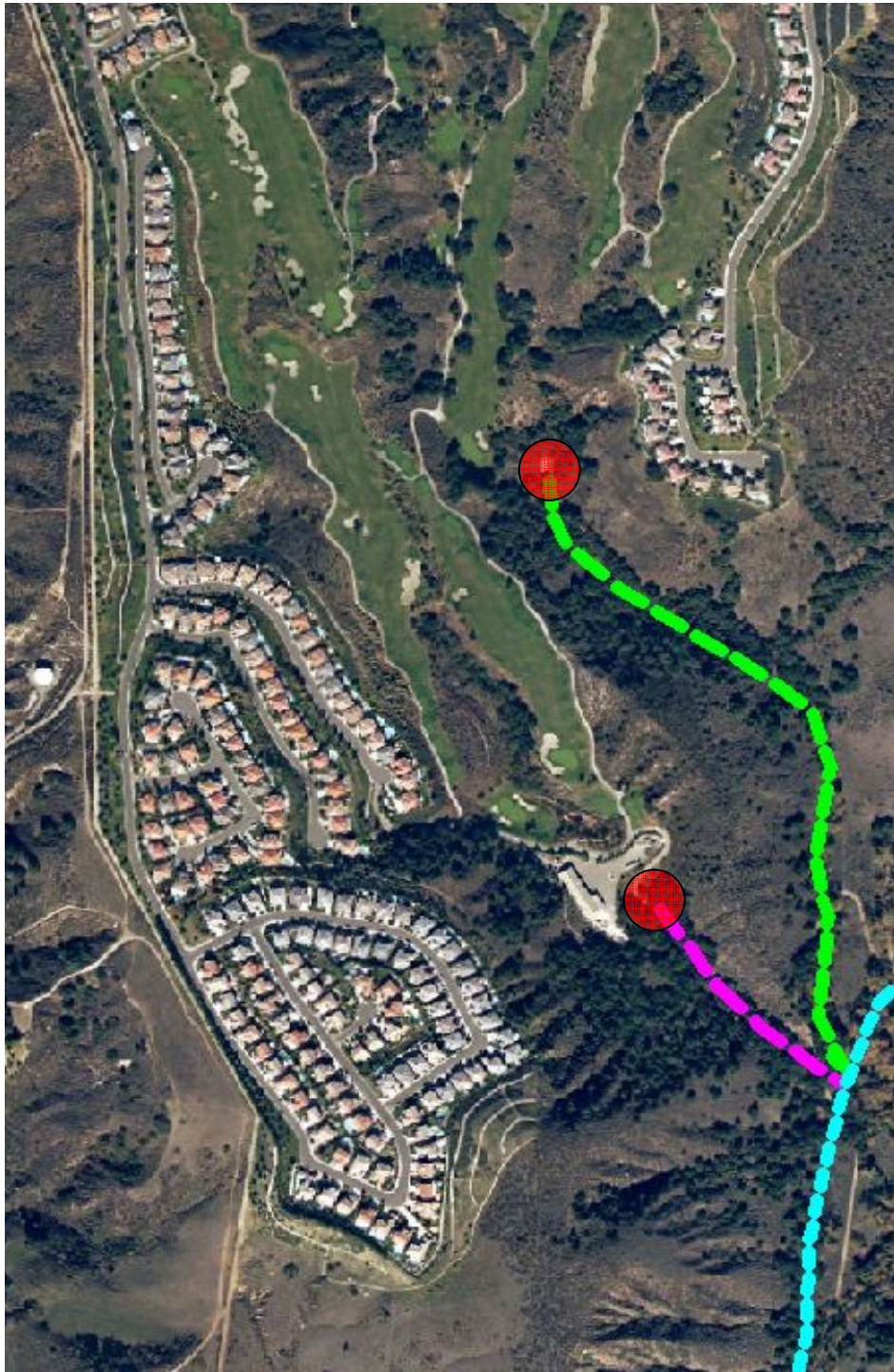
Dove Creek

Bell Creek

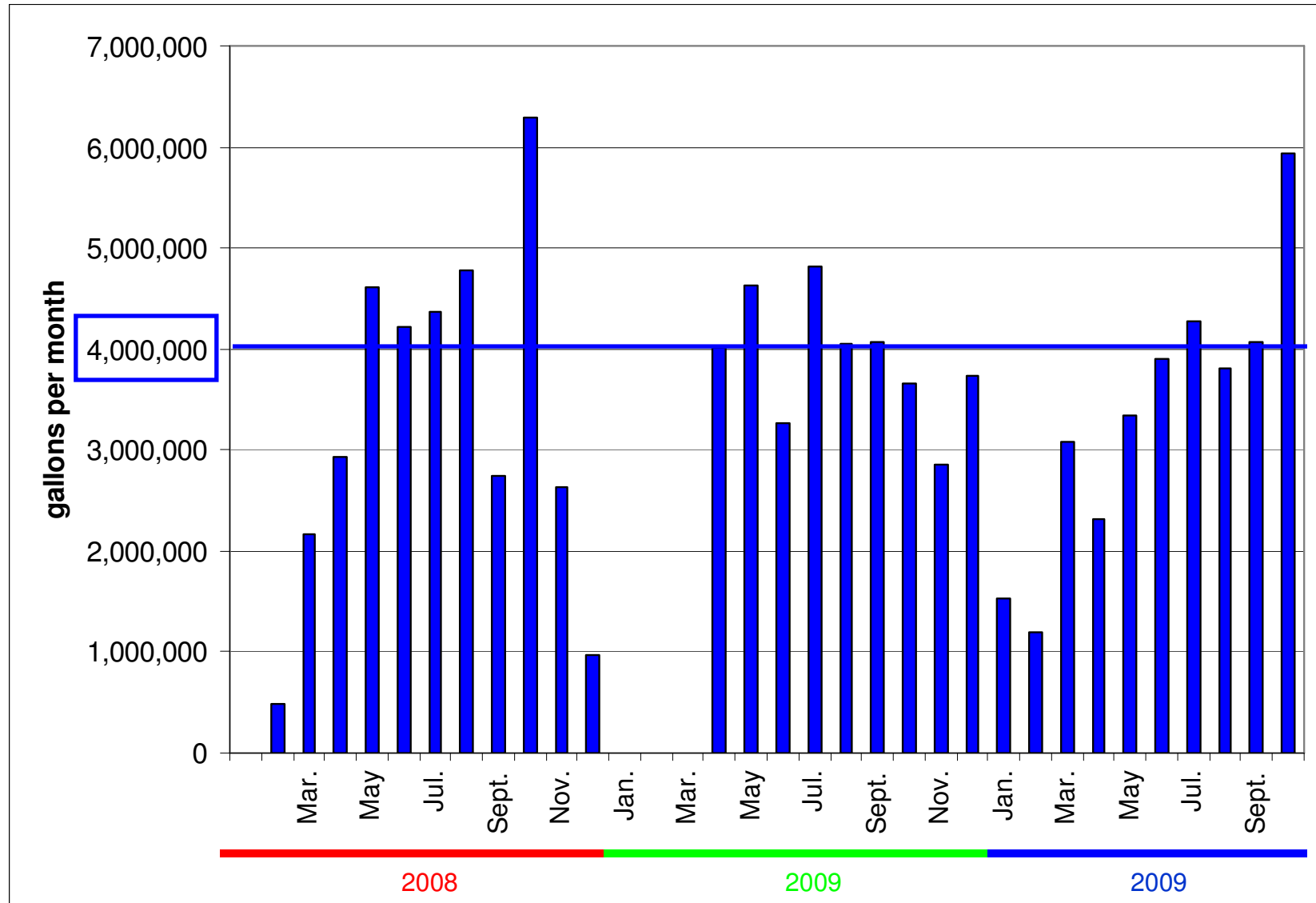
Tick Creek







Cumulative Pump Rates



Site	Nitrates (ppm)	Phosphates (ppm)	TDS (ppm)
Bell N	0	0	457.3 (9.49)
Bell S	0.1 (0.03)	0.2 (0)	644.3 (4.41)
Dove	1.0 (0)	1.1 (0.19)	1147.7 (79.24)
Tick	0.9 (0.06)	2.8 (0.33)	1341.0 (62.9)

Site	Water Temp (C)	DO (mg/L)
Bell N	18.4 (1.62)	7 (0)
Bell S	20.3 (1.38)	6.5 (0.50)
Dove	21.7 (1.10)	6.2 (0.44)
Tick	20.6 (1.02)	3.3 (0.67)

Sampling in June 2005

Means \pm 1 standard error

- 1999 & 2003 CSBP (2003 – 2009)
 - 2010 on – Using 2007 SWAMP Protocol
- Sample BMIs in three randomly selected riffles per reach (100m)**
 - Water Chemistry Sampling
 - Physical Habitat Measurement
- ~900 inverts sorted and identified from each reach (Bill Isham – Weston Solutions)
 - SAFIT taxonomic level I – mostly genus level or higher

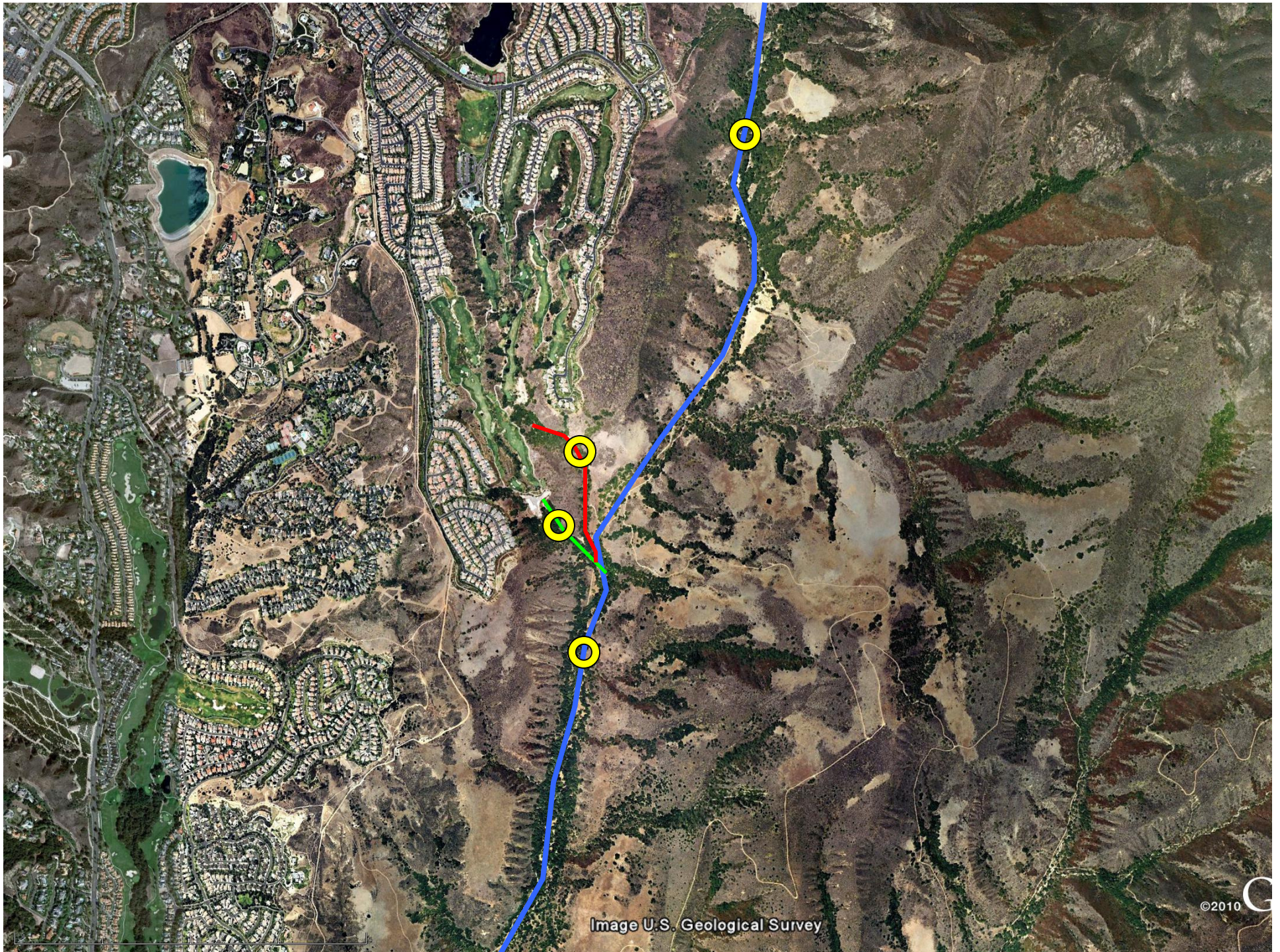


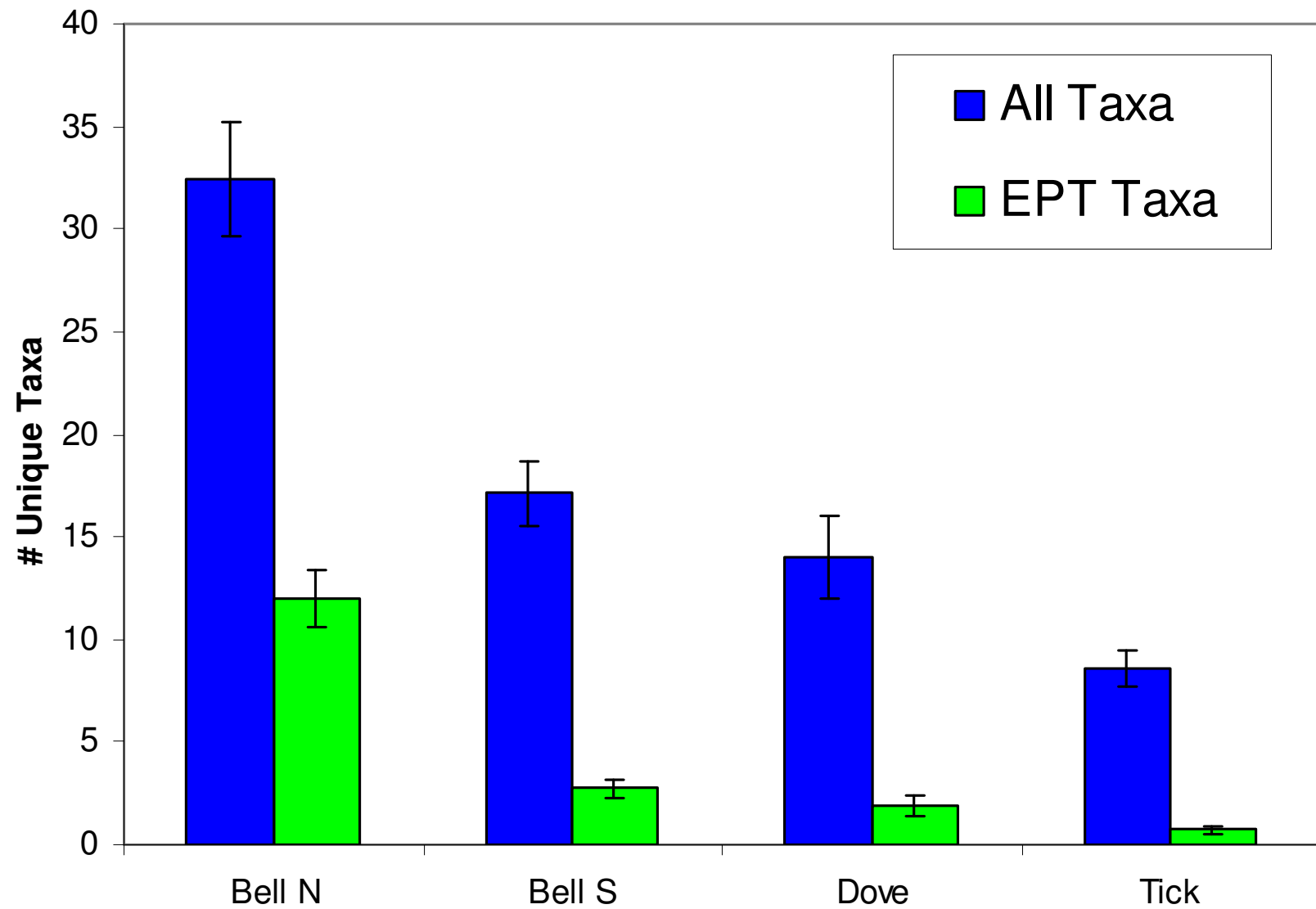
Image U.S. Geological Survey

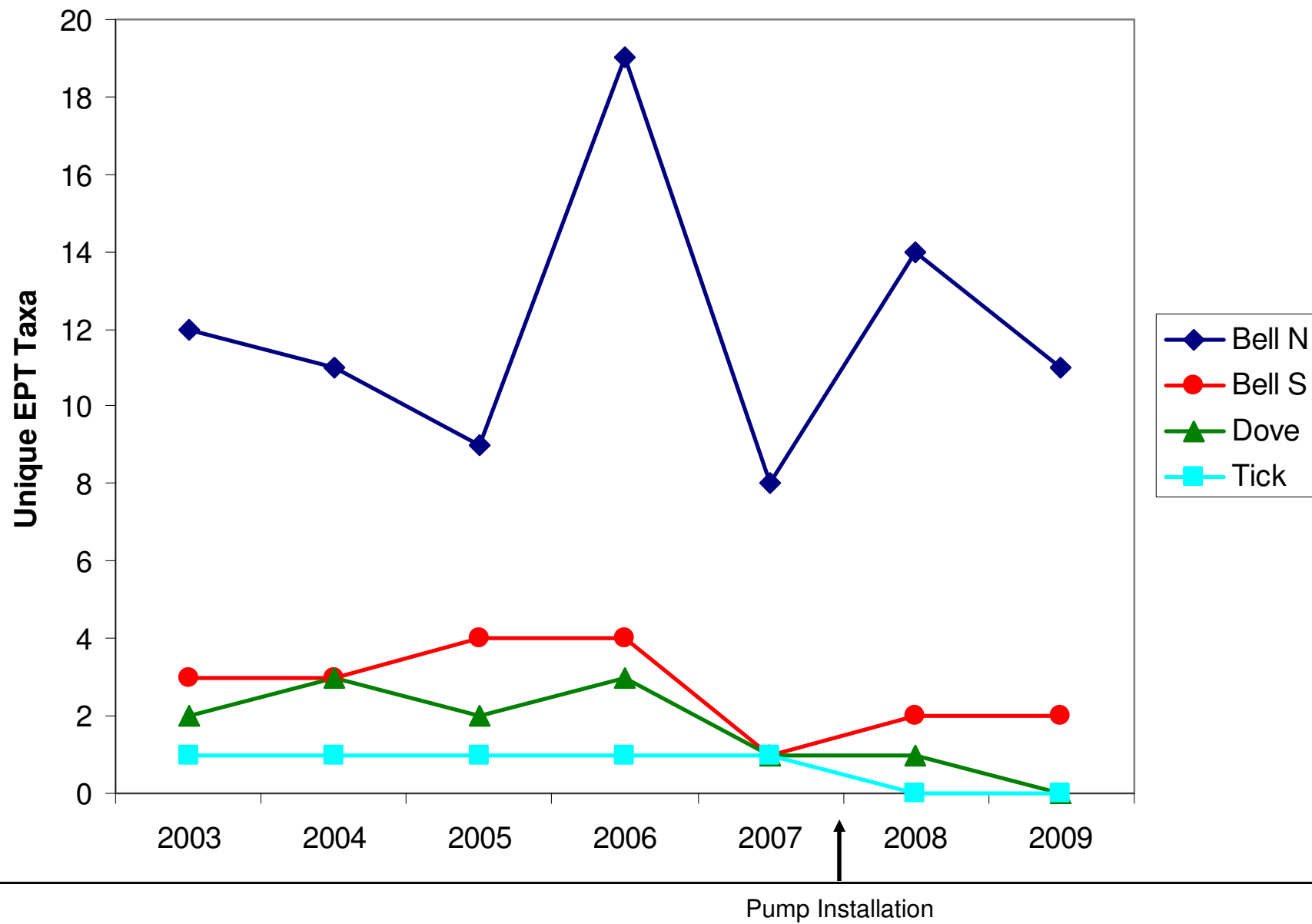


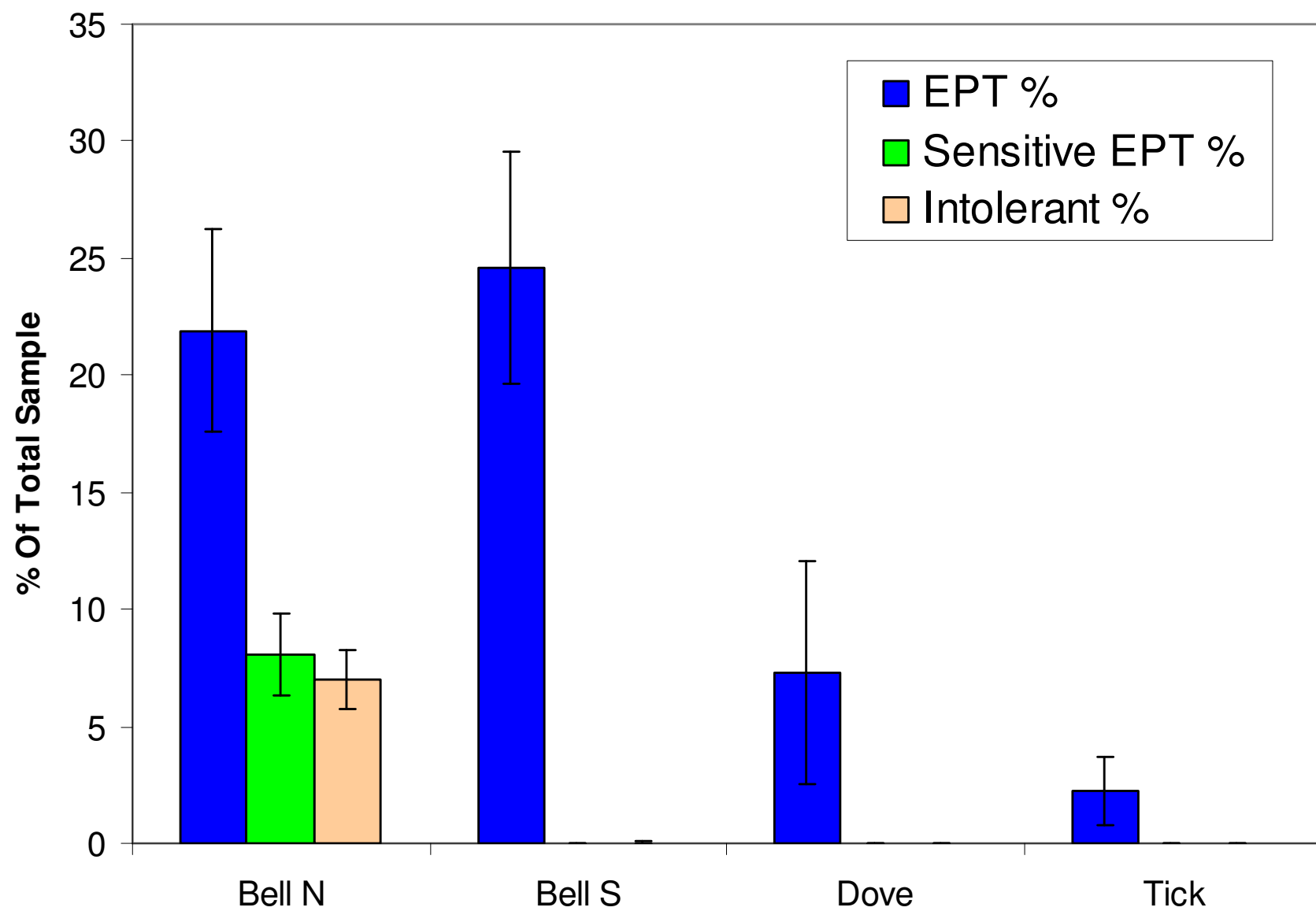
RESULTS

BMI Metrics

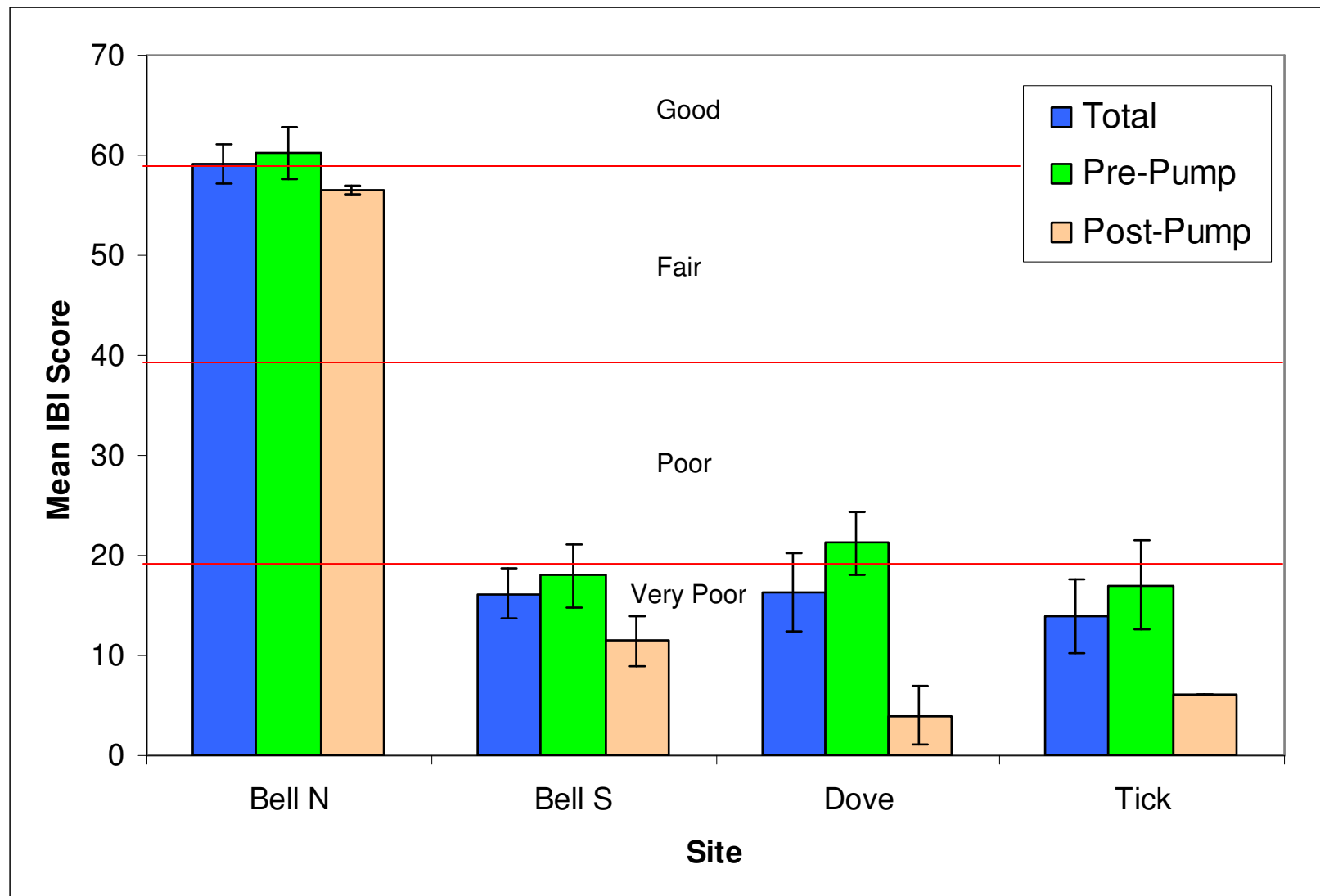
- Richness, composition, tolerance, trophic metrics
- Southern California Coastal Index of Biotic Integrity (IBI)
- Cumulative and yearly
 - Overall impacts
 - Effects of pump installation



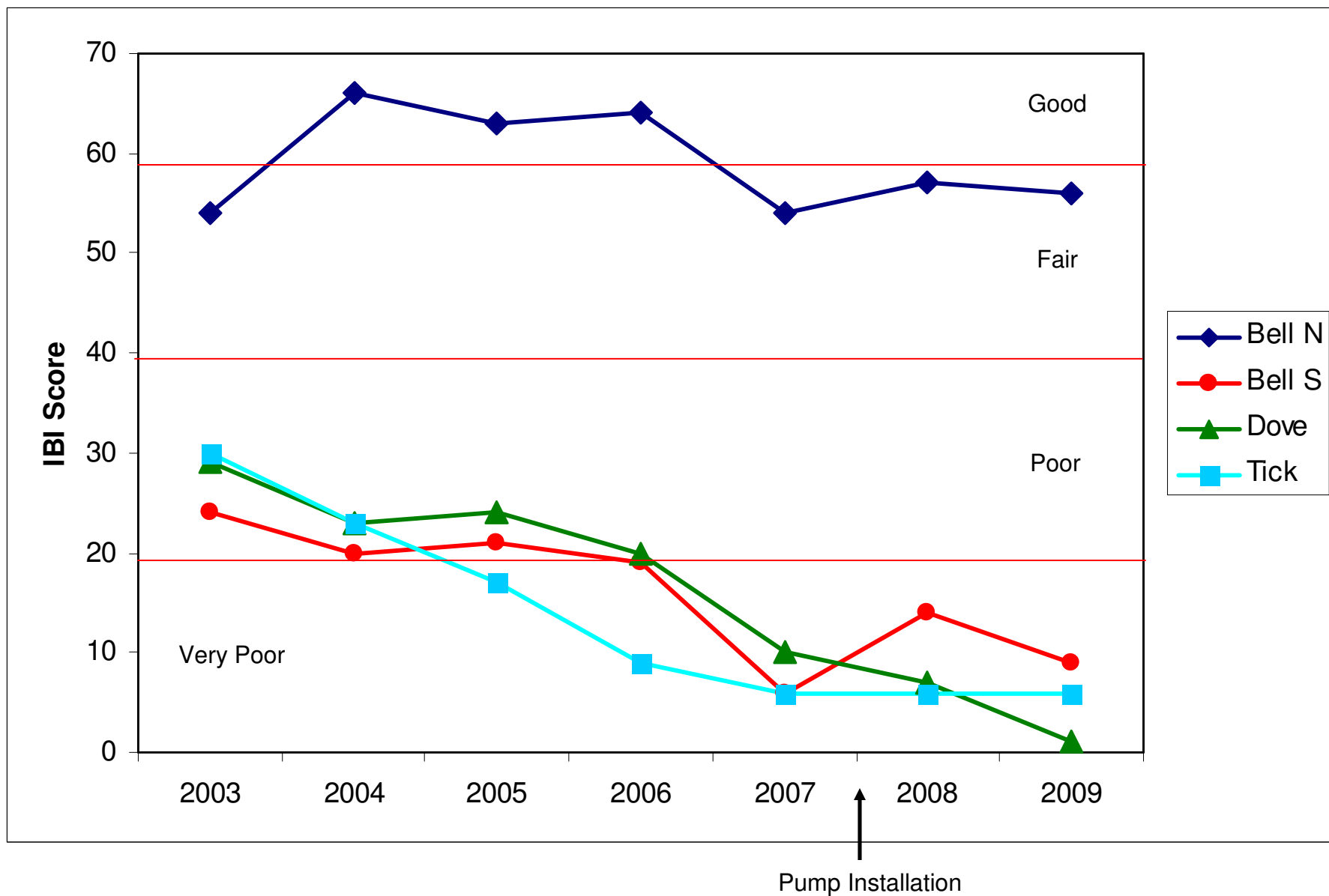




IBI Scores



Rankings: 0-19 Very Poor, 20-39 Poor, 40-59 Fair, 60-79 Good, 80-100 Very Good.



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Summary

- Considerable difference in between metrics calculated above and below confluence
 - Clear impairment
- Indication there might be a slight trend towards improvement
- Unclear if trend represents actual improvement or a decline in Tick and Dove

Next Steps

- Continue to monitor water quality in Bell Creek up and downstream of confluence with Dove and Tick (upgrade to 2007 SWAMP protocols)
- Continue exotic weed removal and riparian restoration (using volunteer “Weed Warriors”)
- Start stream vertebrate monitoring using USGS protocols in Spring, 2011

Education

Starr Ranch Field Ecology Programs

- Created in 2001 by Starr Ranch Research & Education Director (S. DeSimone)
- Integrate Ranch research into education programs



Ecology Programs

Stream Biosurvey

Water Chemistry

Water Quality



Junior Biologists

Ecology of Bell
Creek



Thanks

Projects Volunteers
(too many to list!)

Erick Burres

Bill Isham

Dave Gibson

Raphael Mazor

Maria Vega

Santa Margarita
Water District

Trabuco Water
District

