

Public Outreach, Science and the Regulatory Arena

Public outreach from a scientist's perspective

- A key objective of public outreach is to help create a political environment where the science can be heard
- A Key objective of science is to assure the public that regulations are necessary and will work.

Science without anesthesia

- Good Science (ours) vs Junk Science (theirs)
- Just another data war (yawn)
- “Well, who’s right is just a matter of interpretation”
- “Disagreement between experts – we’ll err on the side of caution”
- “Noted”

Airborne car lands on sleeping man

Pistol under pillow shoots sleeping man

**Dog Chews Off Sleeping Man's Toes - Man Says It
Could Have Been Worse**

Science without anesthesia

- “Good” Science - The first word is redundant.
- Science that matters
- Science that people understand

- Presentations that anesthetize
 - Bullet fever
 - Power Point Phluff

- Emulate Edward Tufte

"The Leonardo da Vinci of data."
NEW YORK TIMES

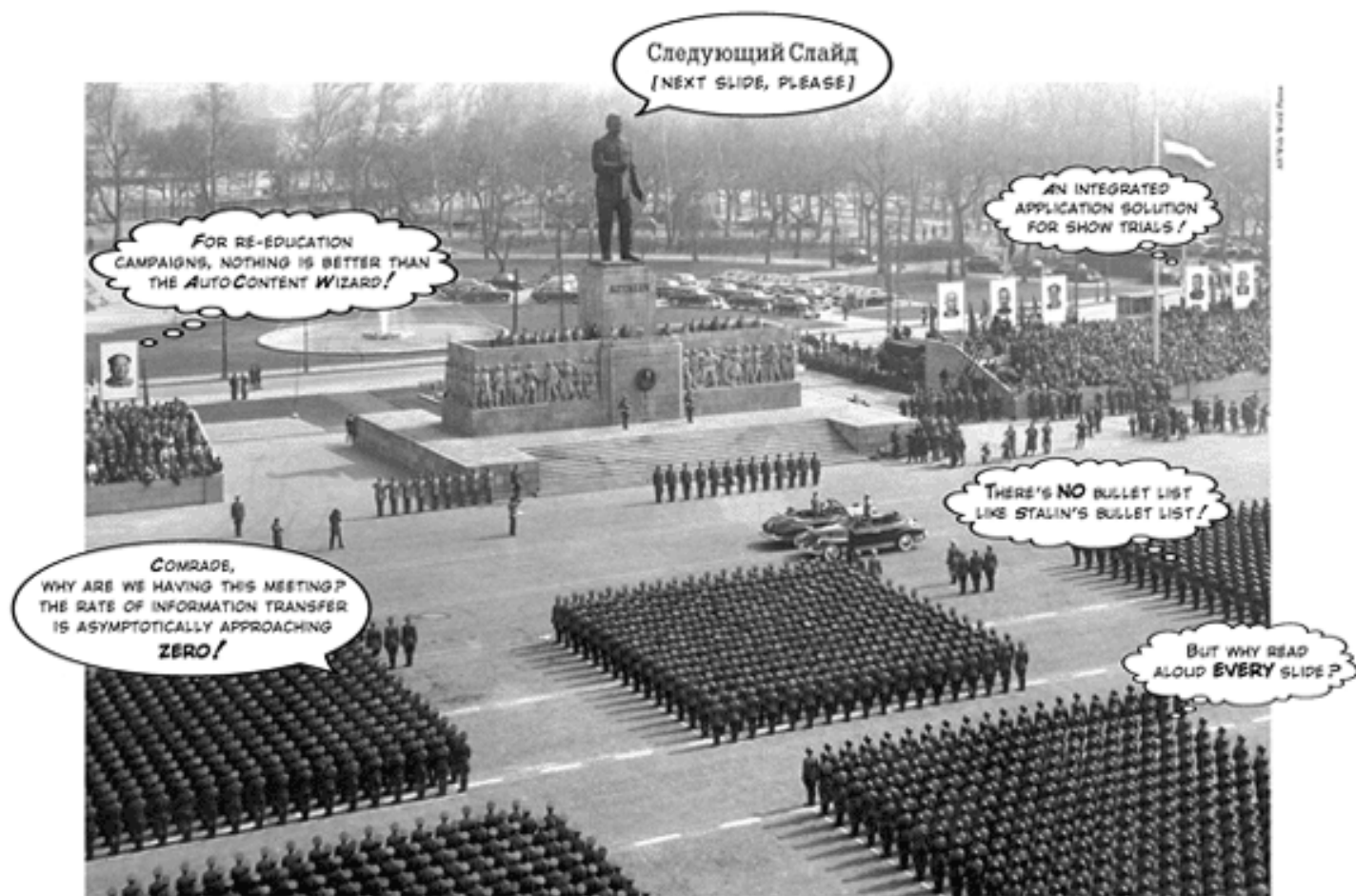
"There's a book that you simply must see. **Riveting** ideas on how to tell **compelling stories of cause and effect** using numbers and images." WASHINGTON POST

"Best 100 books of the 20th century."
AMAZON.COM

www.edwardtufte.com

Edward R. Tufte

The Cognitive Style of PowerPoint



Military parade, Stalin Square, Budapest, April 4, 1956.

Excessive Algae

Floating Macroalgae

**Benthic
Diatoms**

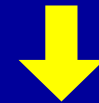


New Studies and Data

- Risk Assessment (Malibu)
- Rancho Groundwater (JV)
- Lagoon sediment (SCCWRP)

Excess Nutrients

- Creek algae (SCCWRP)
- Bioassessment (UCLA)
- Winter algae (HTB)
- Winter algae (JV)



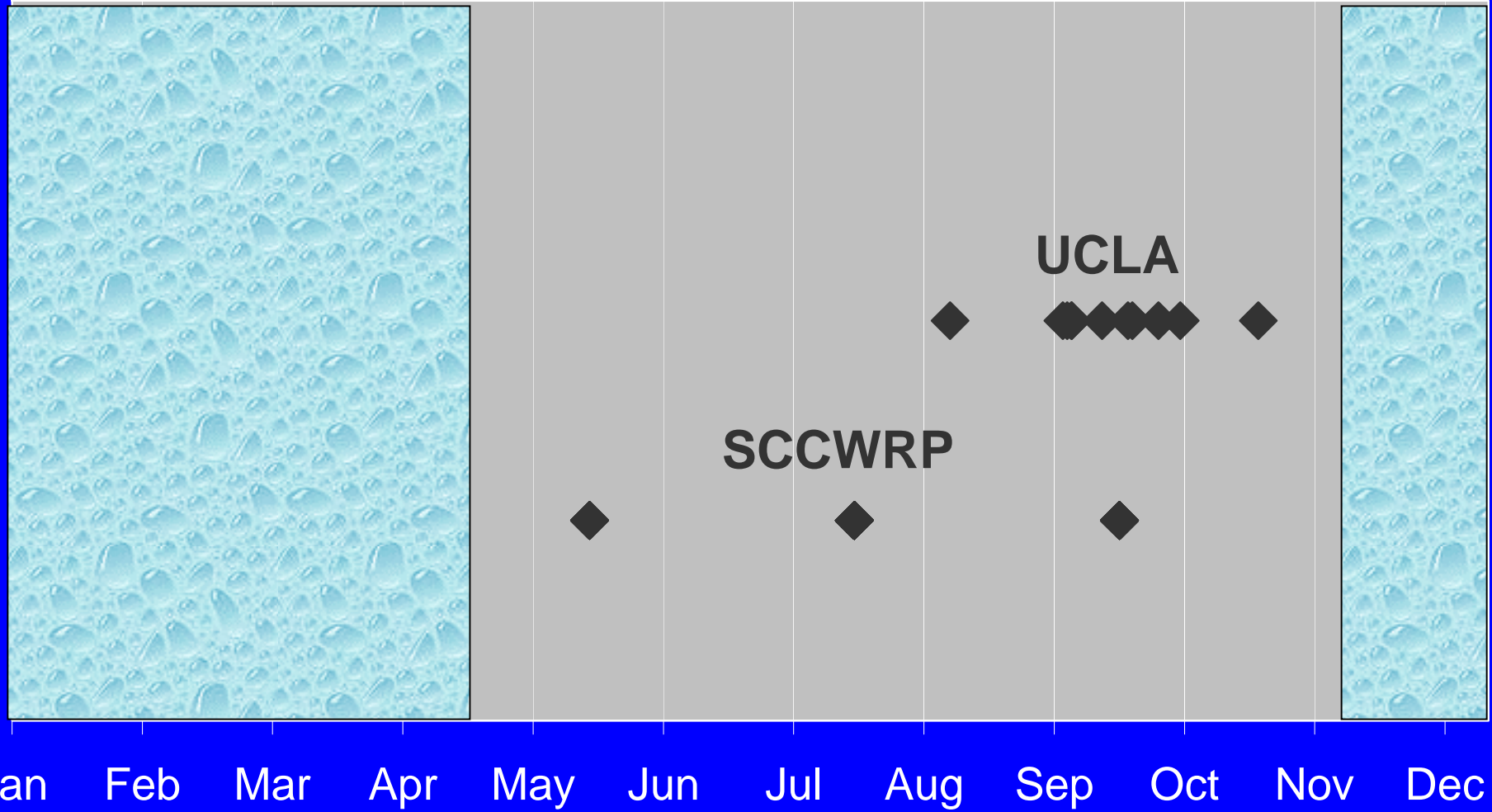
Excess Algae

- Winter DO data (JV)
- Macroinvertebrates (Luce)



Impaired Water
Quality

Neither study sampled in winter



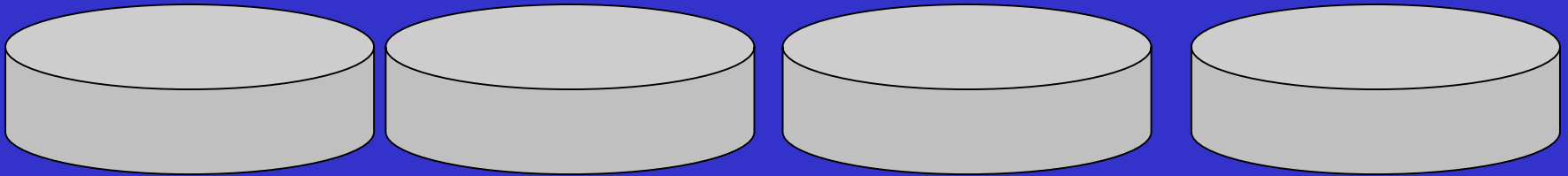
	Algae Biomass	Diatoms	Macro- algae	Macro- phytes
FLOW				0.42
TEMP			-0.14	-0.18
pH		-0.21		-0.27
Cond.		0.31	0.20	
N		-0.21		
P				
N:P	0.18	(-0.143)		
PO4		-0.17		0.17
NO3		-0.28		0.35
NH4		-0.09		0.20
Light			0.30	
Unstable	0.20	-0.24	(-0.130)	-0.14

Source: Table 7, Ambrose et al. 2003

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SCCWRP Experiment



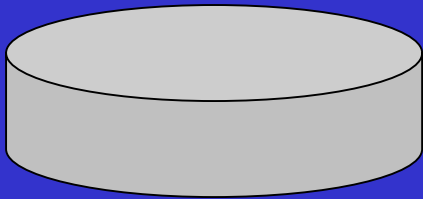
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P

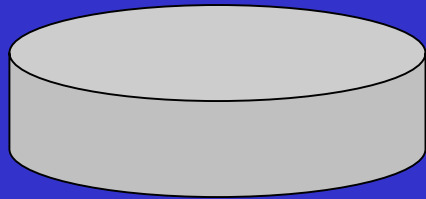
N

N + P

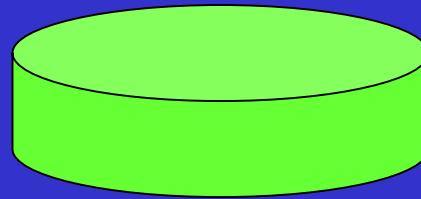
SCCWRP Experiment



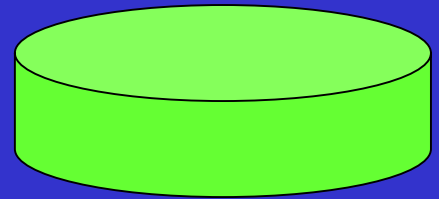
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P



N



N + P

SCCWRP Experiment

Nothing

P

N

N + P

SCCWRP Experiment

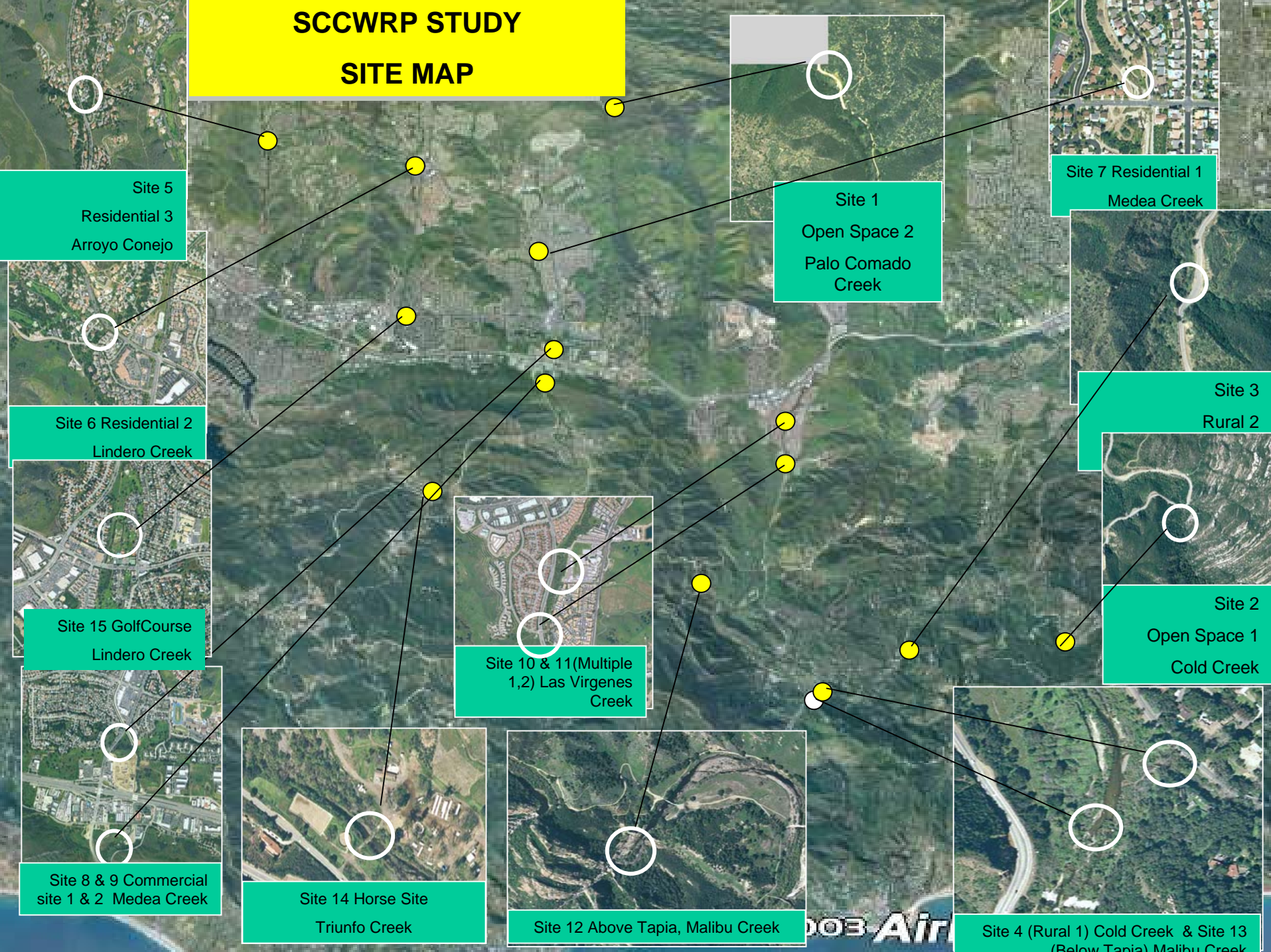
Nothing

P

N

N + P

SCCWRP STUDY SITE MAP



Site 5
Residential 3
Arroyo Conejo

Site 1
Open Space 2
Palo Comado
Creek

Site 7 Residential 1
Medea Creek

Site 6 Residential 2
Lindero Creek

Site 3
Rural 2

Site 15 GolfCourse
Lindero Creek

Site 10 & 11(Multiple
1,2) Las Virgenes
Creek

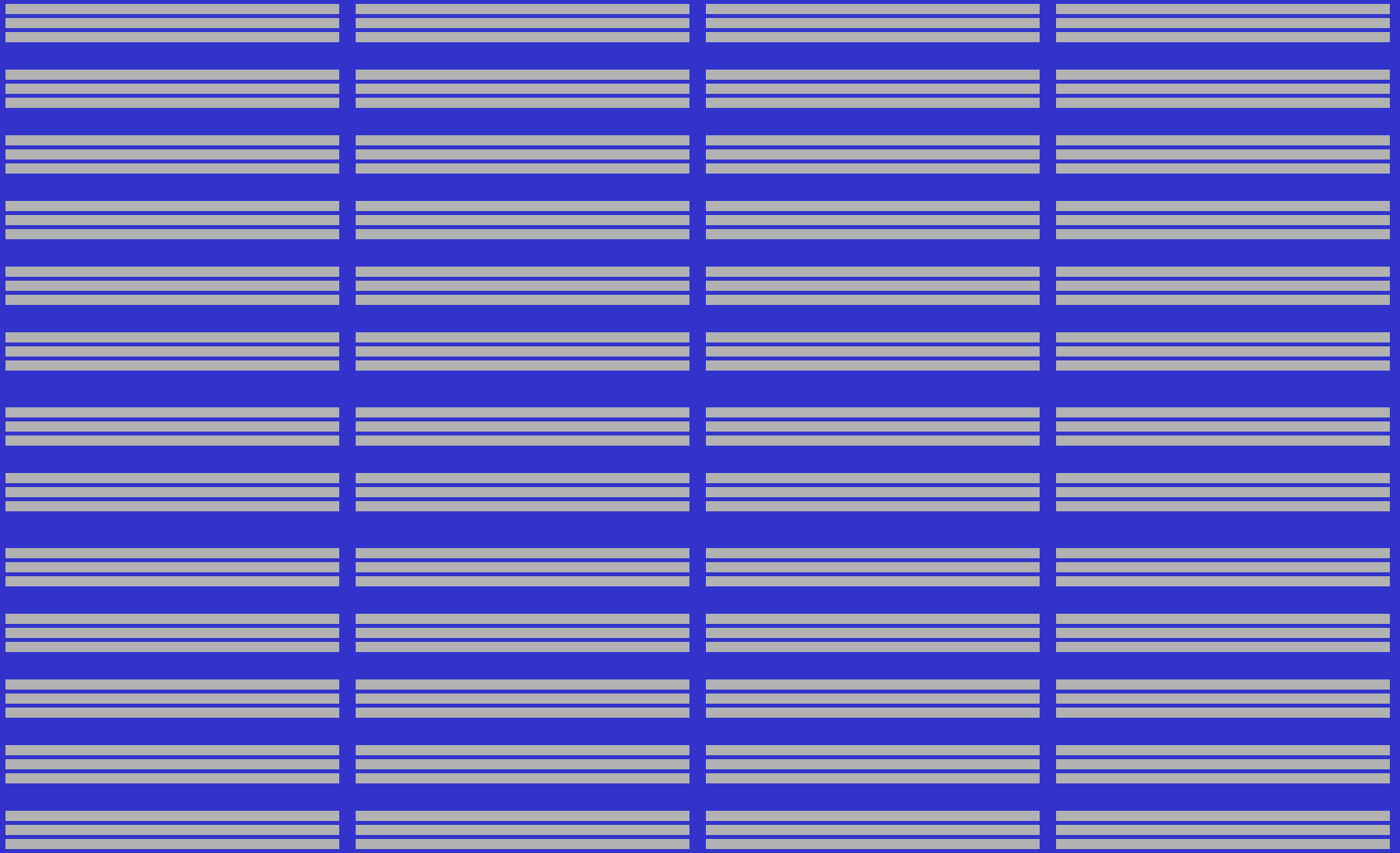
Site 2
Open Space 1
Cold Creek

Site 8 & 9 Commercial
site 1 & 2 Medea Creek

Site 14 Horse Site
Triunfo Creek

Site 12 Above Tapia, Malibu Creek

Site 4 (Rural 1) Cold Creek & Site 13
(Below Tapia) Malibu Creek



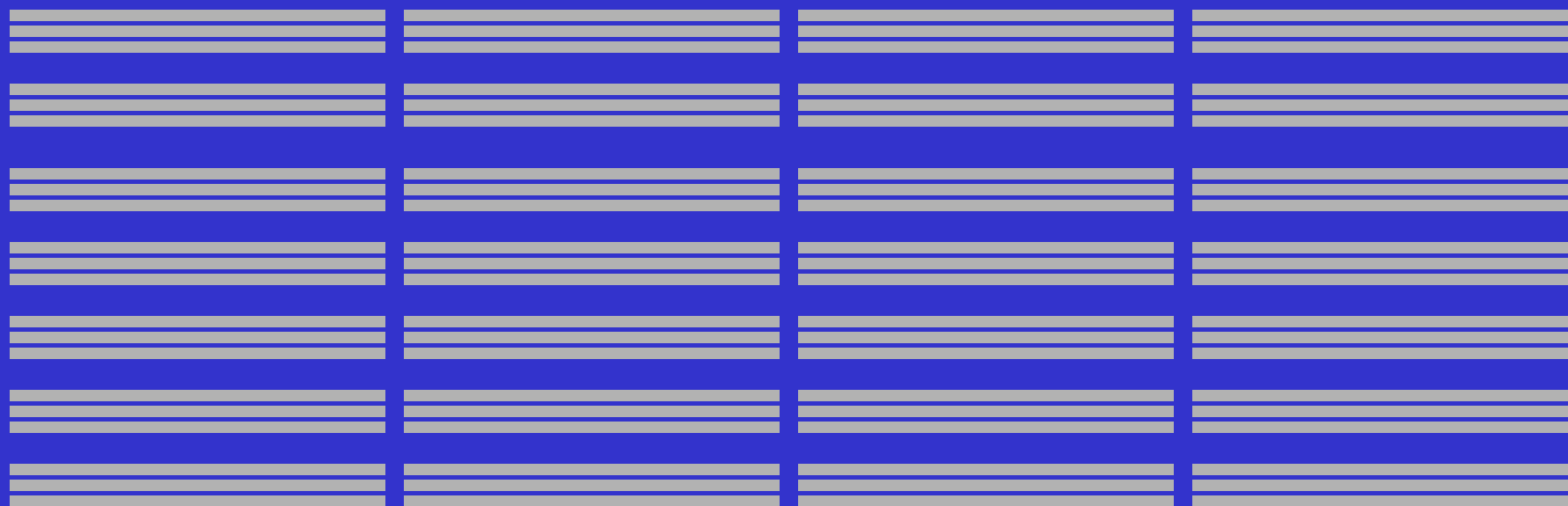
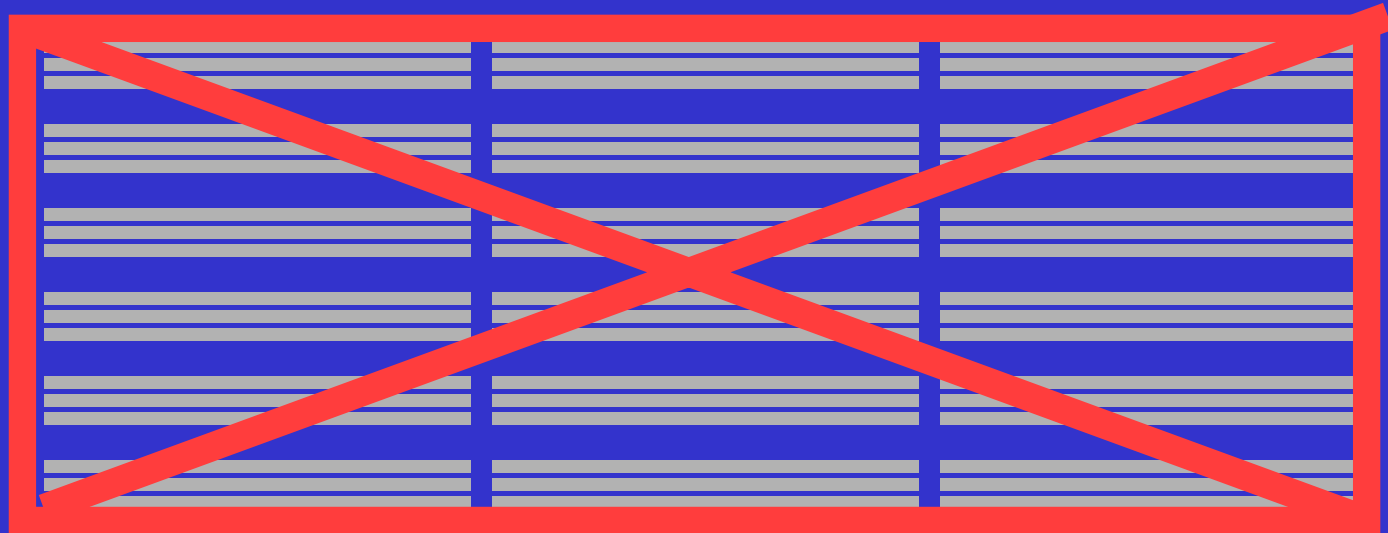
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P

N

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2001



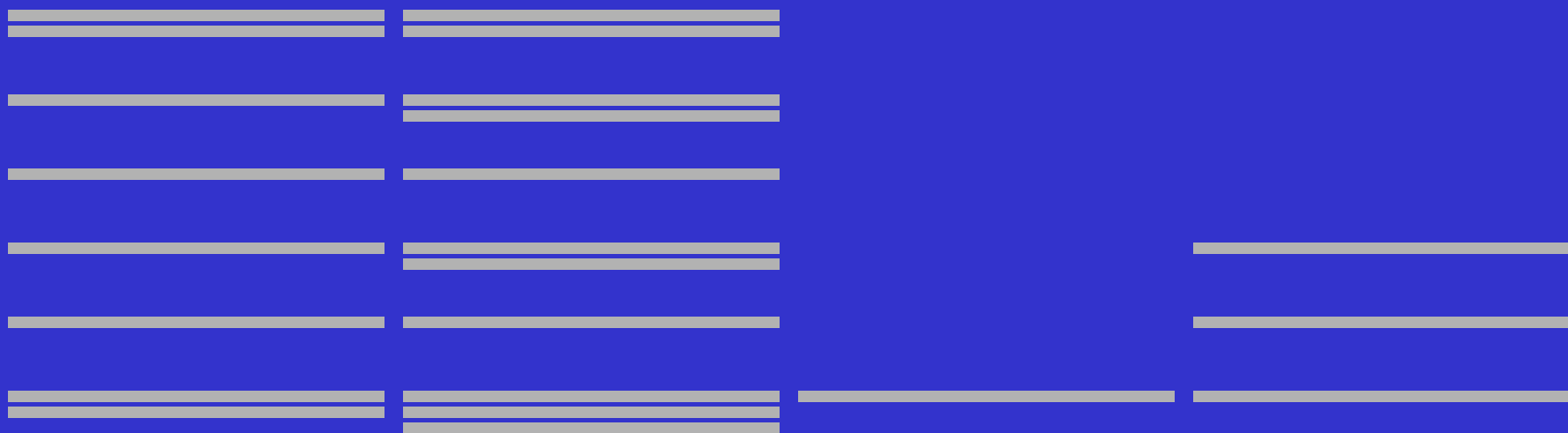
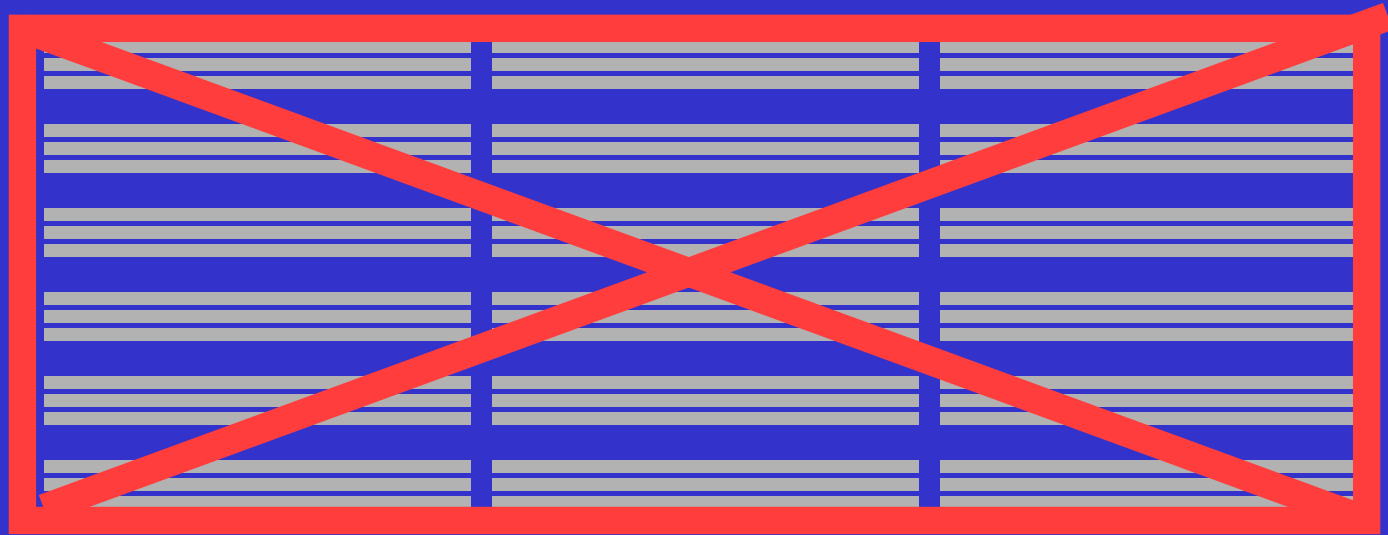
Nothing

P

N

N + P

2001



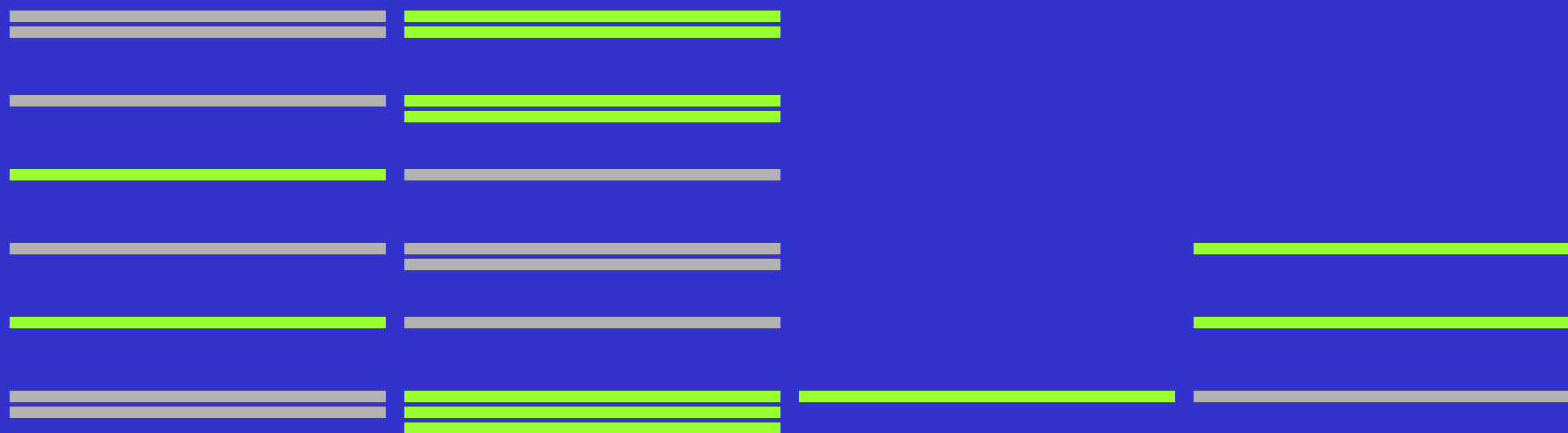
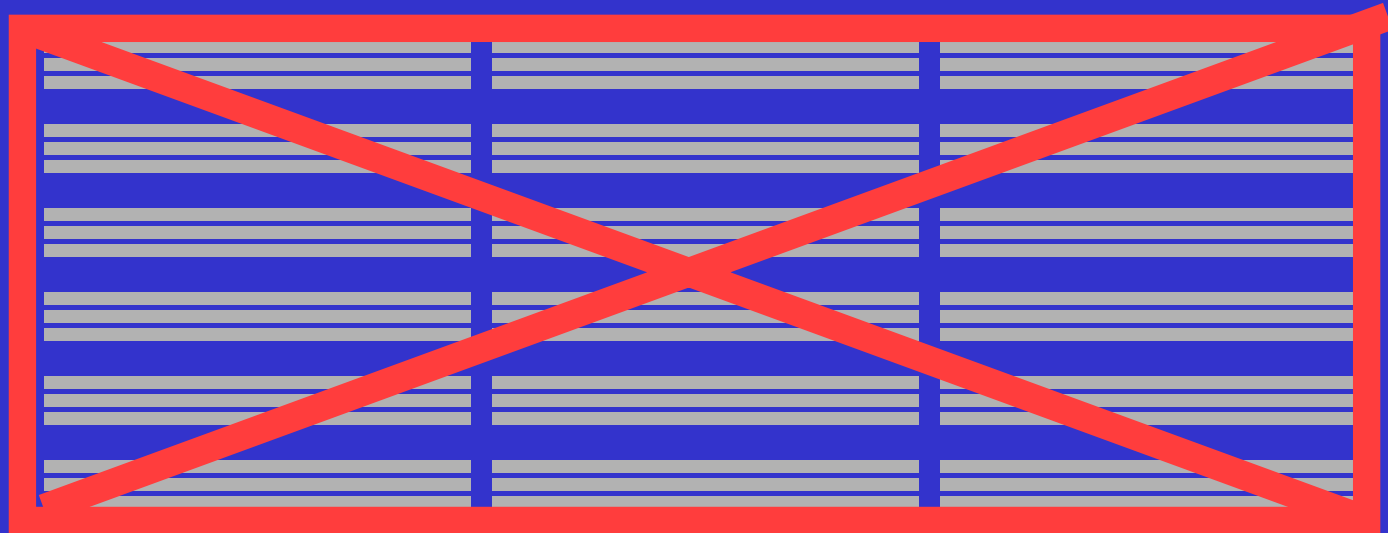
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N

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2001



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P

N

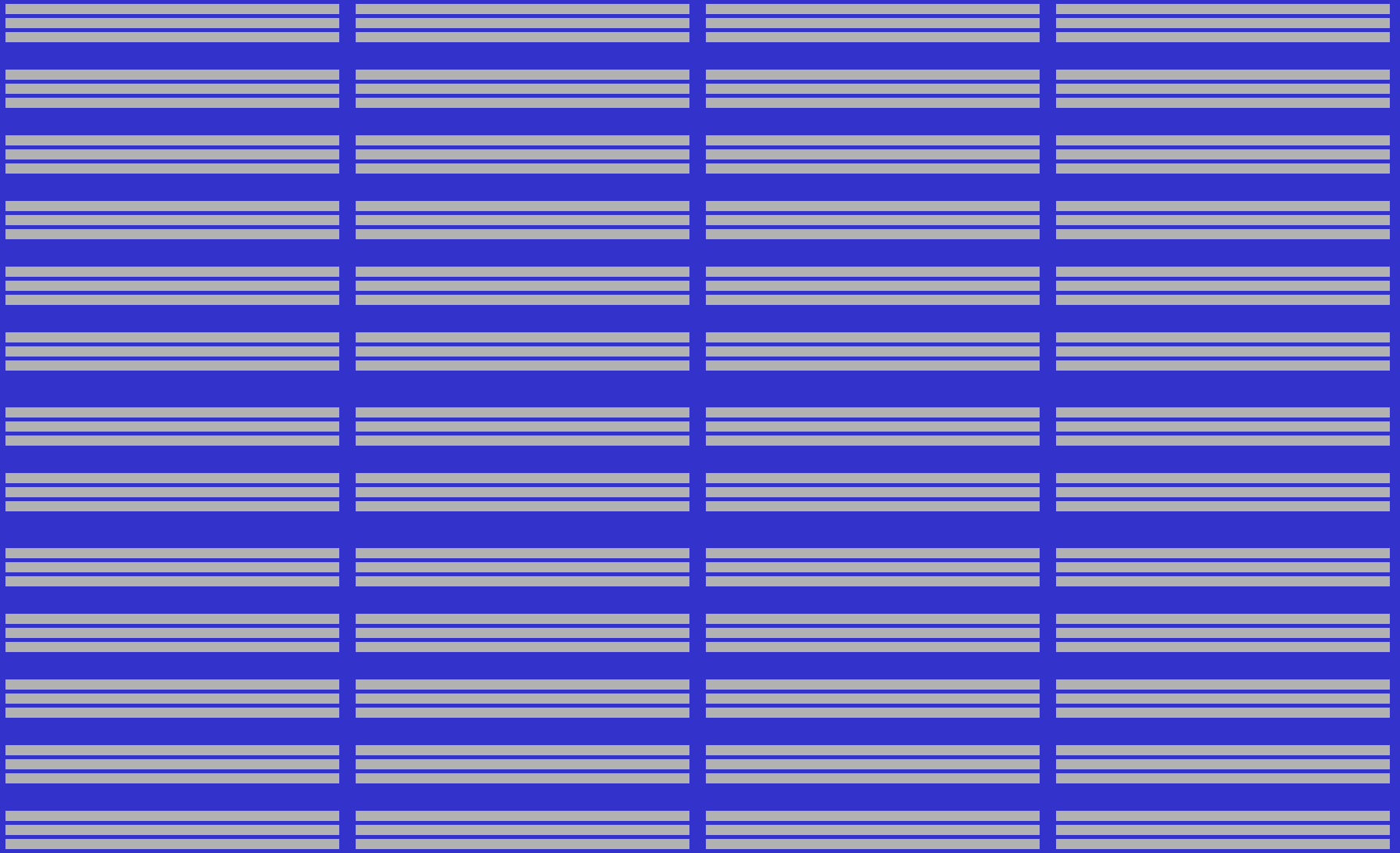
N + P

2001

Results - 2001

- 6 sites – no information
 - 2 sites – inconclusive
 - 4 sites – contradictory
-

12 Sites - no nutrient link demonstrated



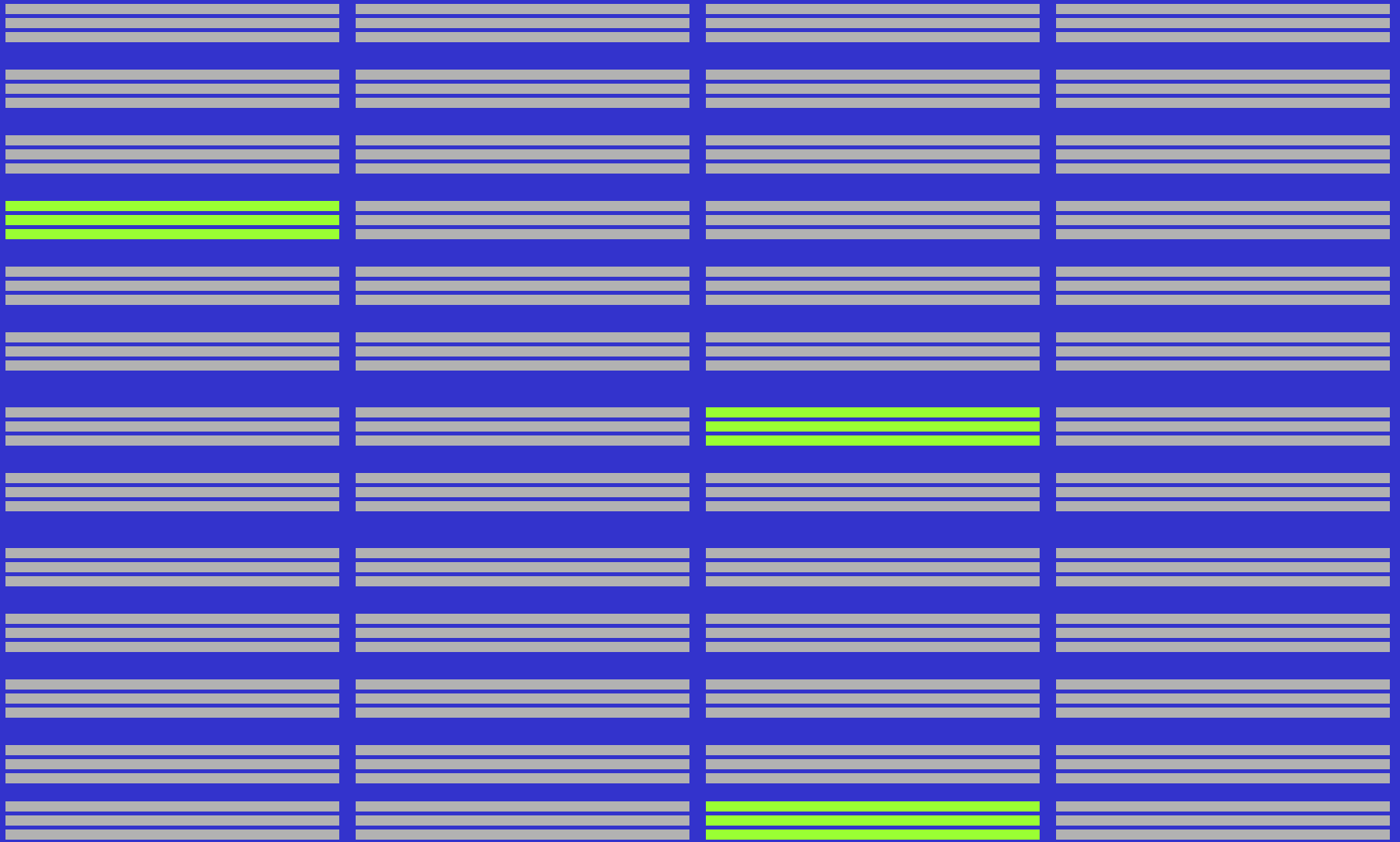
Nothing

P

N

N + P

2002



Nothing

P

N

N + P

2002

Results - 2002

- 9 sites – no effect
 - 3 sites – contradictory results
-

12 sites – no nutrient link demonstrated

“Reducing nutrient concentrations . . . would *probably* reduce benthic diatoms, but *might have less of an effect* on floating macroalgae.”

SCCWRP Report No. 412 – Conclusions, p. 21



Floating Macroalgae

**Benthic
Diatoms**

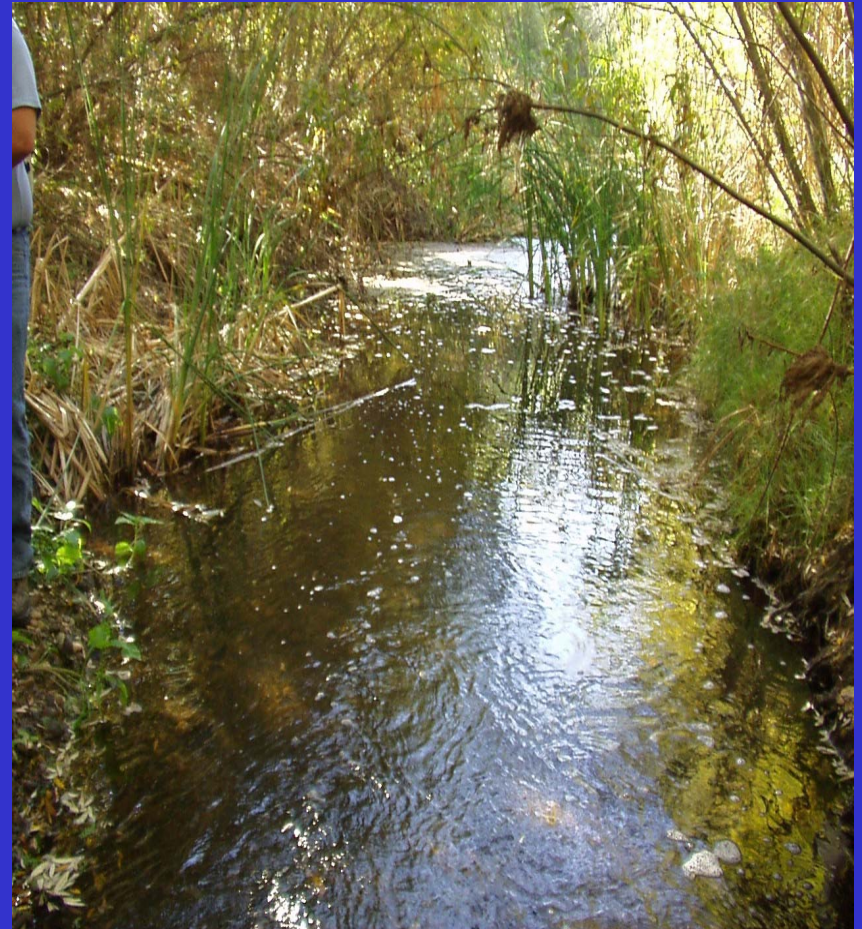
“Thus, the management of algal growth must be considered on a *site-by-site basis*, taking into account the types of algae causing nuisance blooms and the nutrient inputs and *other environmental conditions that regulate growth.*”

SCCWRP Report No. 412

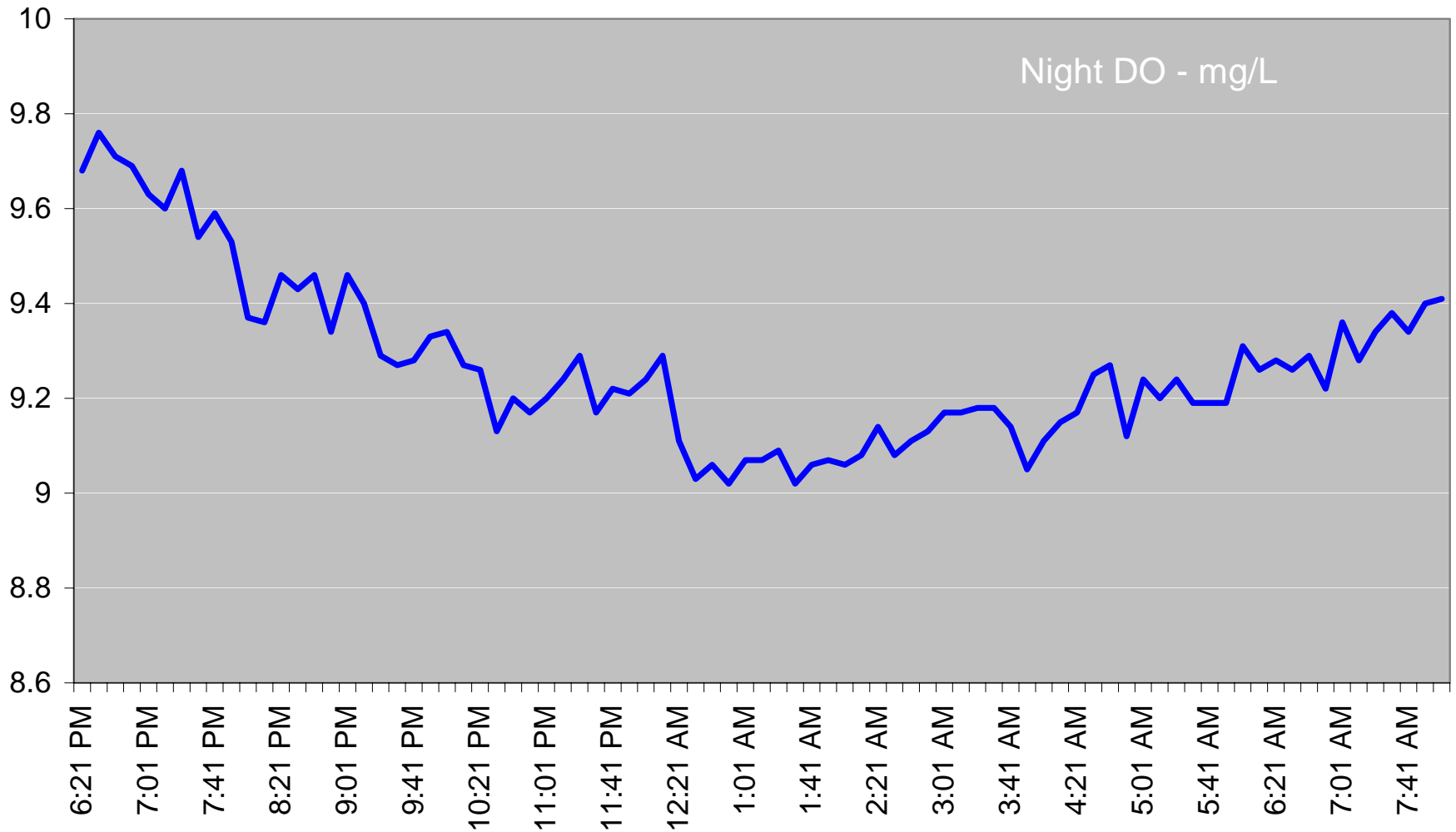
Nutrient Impairments

- ~~Aquatic toxicity, generally related to nitrogen as ammonia~~
- Excessive growth of algae and vascular plants caused by elevated levels of nitrogen and or phosphorus
 - leads to low dissolved oxygen
 - Impairment of aquatic habitat
 - Impairment of recreational use

Dissolved Oxygen Levels



... are Good



Dissolved Oxygen Levels

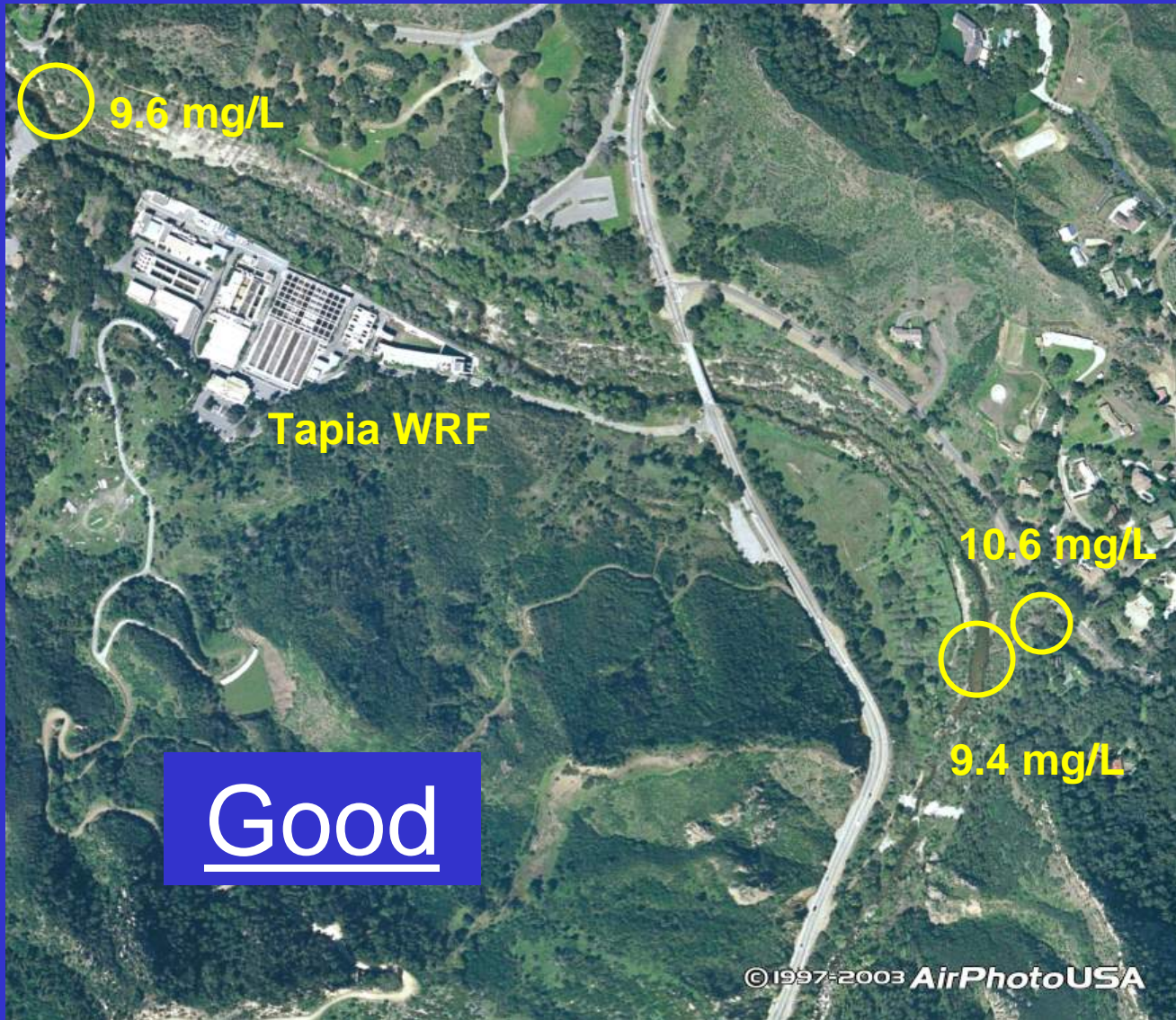
Malibu Lagoon



Cross Creek Road

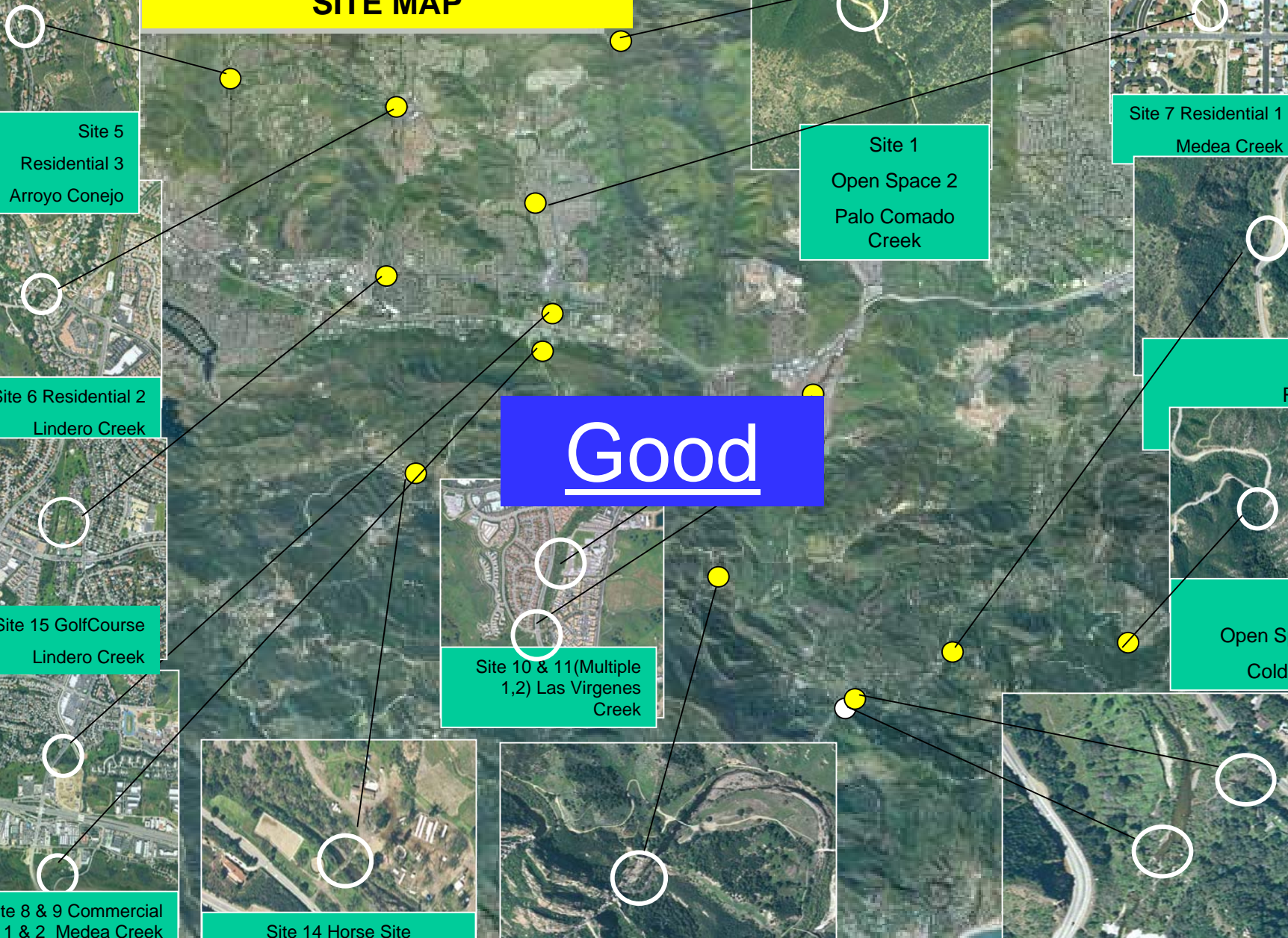
Good

Dissolved Oxygen Levels



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Good



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Thank you.