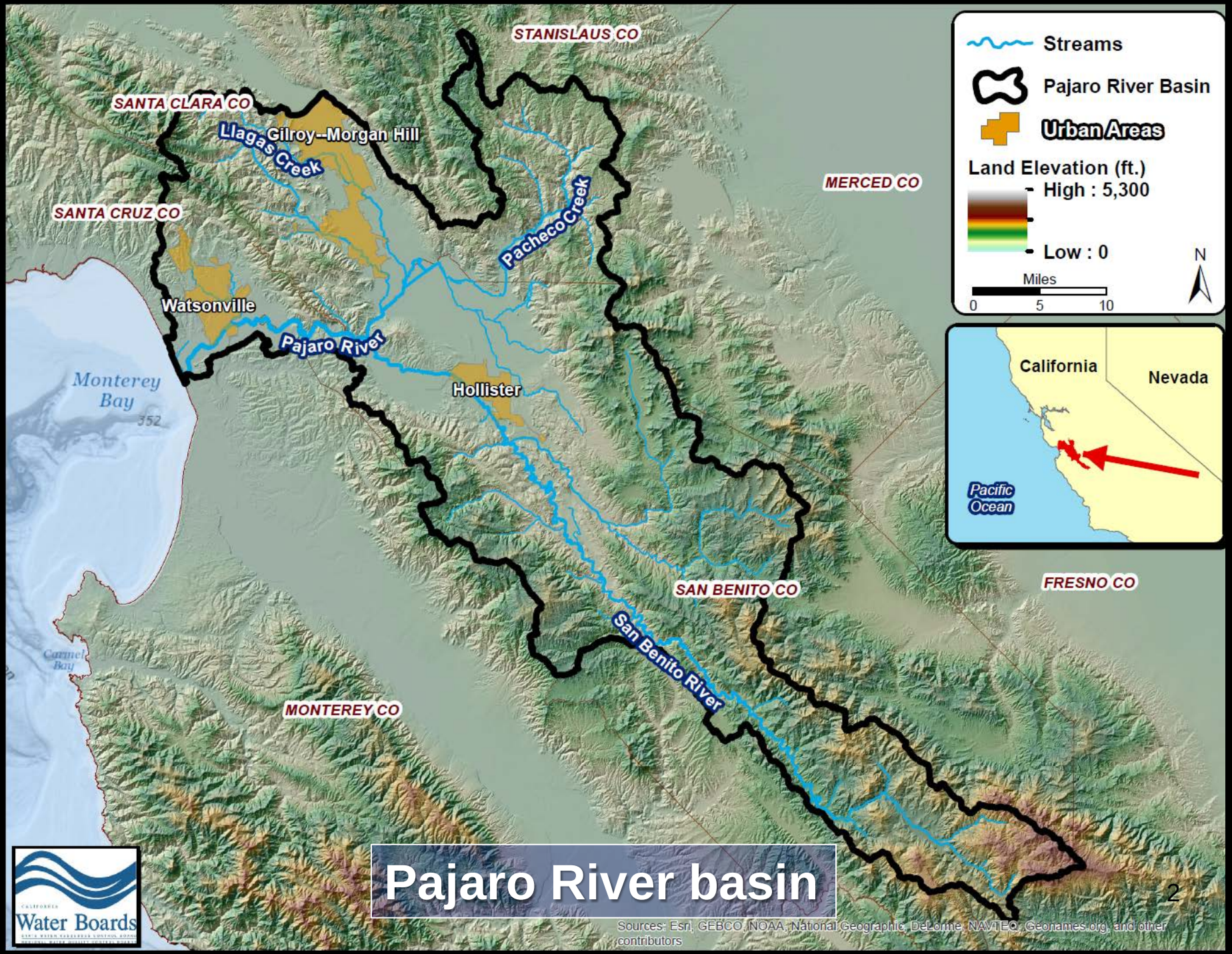
TMDLs for Nitrogen Compounds & Orthophosphate *in* Streams of the Pajaro River Basin

Agenda Item 13

Pajaro River @ Thurwatcher Rd.
April 2007
Photo credit: Mary Hamilton

Peter Osmolovsky
Jennifer Epp
Shanta Keeling
Water Board TMDL Program

California Water Boards
State Water Resources Control Board
Regional Water Quality Control Boards



Pajaro River basin

Staff Recommendation…

Adopt Resolution No. R3-2015-0004

Amend Basin Plan to incorporate…

TMDLs and an associated implementation strategy addressing nutrient pollution in streams of the Pajaro River basin

algae mats
lower Pajaro River
July 6, 2015
photo credit: Robert Ketley, City of Watsonville

TMDL Highlights...

- TMDLs are plans to improve water quality & are required by CWA
- TMDLs use existing , planned, or new regulatory measures to implement TMDL water quality goals
- Proposed implementation strategy for this TMDL:
  - ✓ Leverage existing permits, orders, & prohibitions in the river basin
- Applicable water quality objectives may take many years to achieve
- USEPA recommends and supports TMDL adoption

Confluence of Swanson Creek & Uvas Creek
Pajaro River basin
Photo courtesy of Ron Horri

Nutrient Pollution (nitrogen & phosphorus)…

- What is the environmental problem?

Nutrients
(nitrogen, phosphorus)

Physical factors
(stream hydraulics, substrate, temperature)

Sunlight availability
(turbidity, tree canopy)

Plant growth

Excess algal biomass

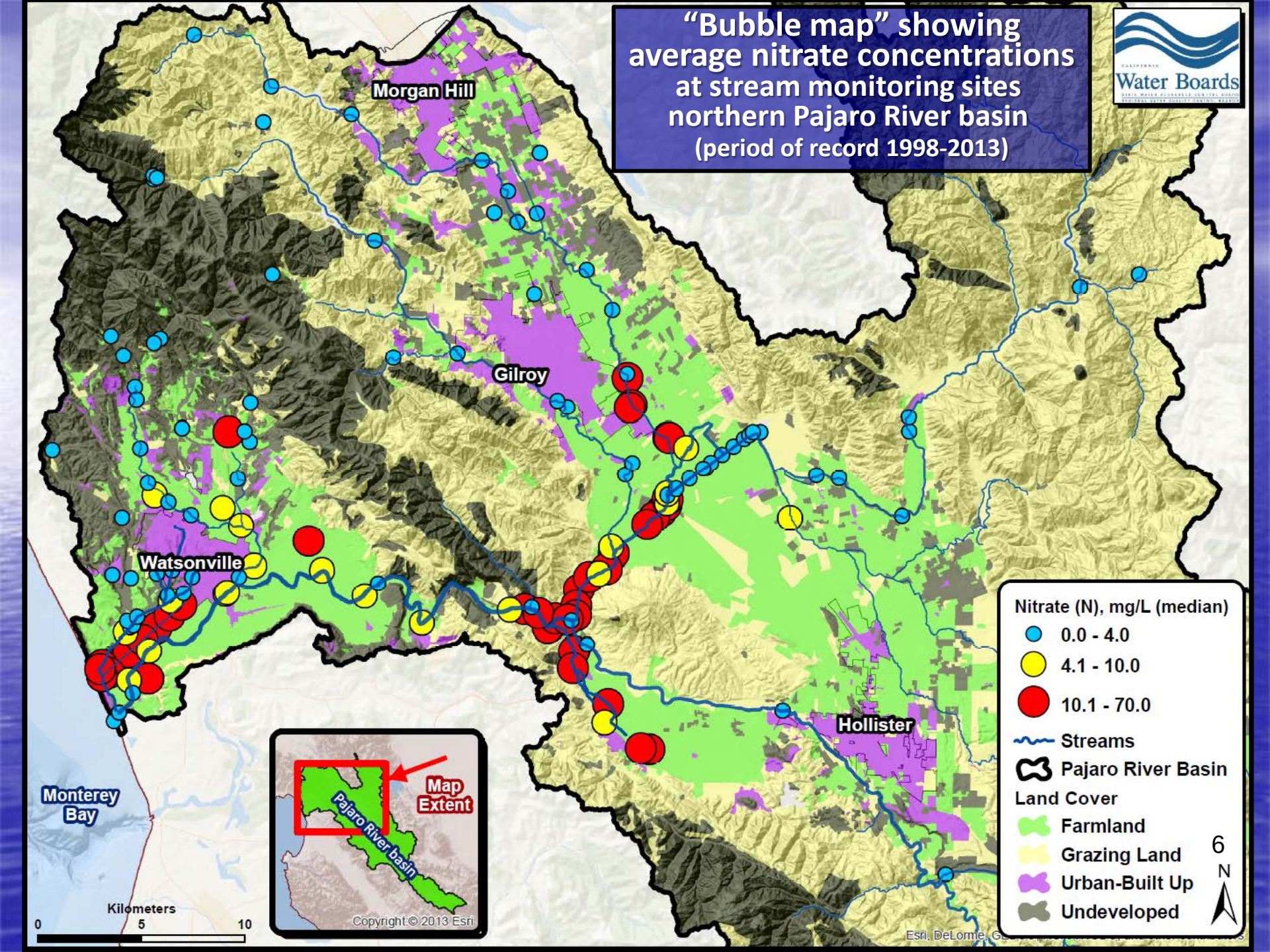
Dissolved oxygen (DO) imbalances

Decreased biological diversity

Public nuisance – public health risks

Hypoxia (DO crashes), fish kills, disruption of aquatic food web

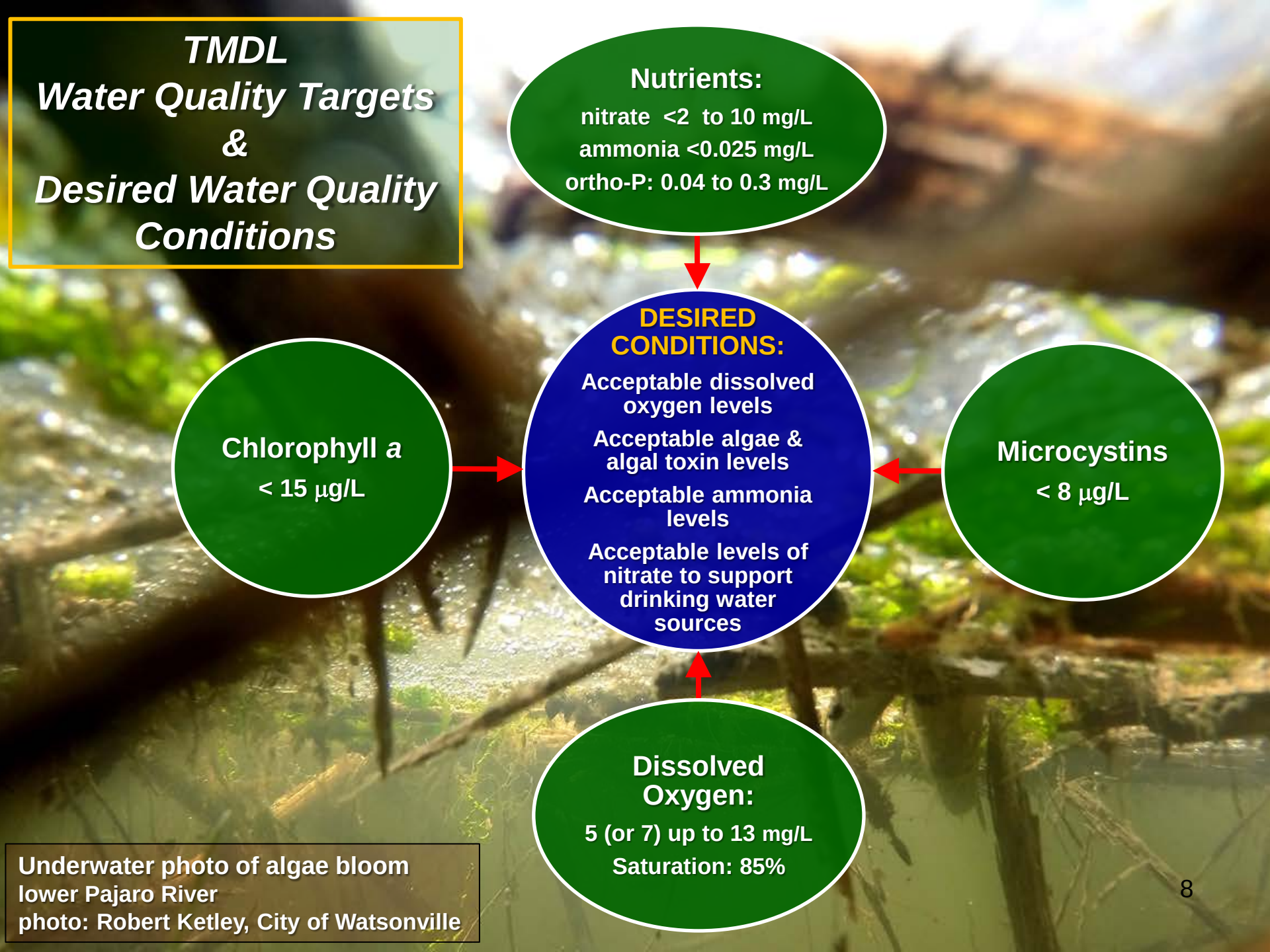
Pajaro River, June 2002
Photo credit: Mary Hamilton, CCRWQCB


"Bubble map" showing average nitrate concentrations at stream monitoring sites northern Pajaro River basin
(period of record 1998-2013)
Water Boards
Morgan Hill
Gilroy
Watsonville
Hollister
Monterey Bay
Map Extent
Pajaro River basin
Copyright © 2013 Esri
Kilometers
0
5
10
Nitrate (N), mg/L (median)
0.0 - 4.0
4.1 - 10.0
10.1 - 70.0
Streams
Pajaro River Basin
Land Cover
Farmland
Grazing Land
Urban-Built Up
Undeveloped
N
Esri, DeLorme, GE

Major Controllable Sources of Nutrients to Streams in the Pajaro River Basin…

Source Category
Agricultural fertilizer
Municipal runoff
Shallow groundwater

Carnadero Creek, August 2011
Pajaro River basin
photo credit: Mary Hamilton



Underwater photo of algae bloom
lower Pajaro River
photo: Robert Ketley, City of Watsonville

Priority Areas & Pollutant Load Reductions Anticipated…

- Primary focus is on nitrogen (N) loading reductions, but reducing P loads may also help to reduce risks of impairments to aquatic habitat.
- High Priority Areas:
  - ✓ Lower Pajaro River & Watsonville Slough subwatersheds
  - ✓ Upper Pajaro River & Lower Llagas Creek subwatersheds
  - ✓ San Juan Valley subwatershed
- Estimated N load reductions needed:
  - ❖ 20 assessed streams in the river basin…
    - ✓ Average N load reduction needed: 19% (wet season), 53% (dry season)
    - ✓ Range of N load reductions needed: 0% to 91%

How will we measure TMDL progress?

- TMDL contemplates flexibility and use of various metrics to assess progress;
- Improvements in *biological-response parameters* (dissolved oxygen, chlorophyll, biomass) may constitute proxy indicators of progress.

Pajaro River, July 2007
Photo credit: Mary Hamilton

Recommended TMDL Implementation Strategy…

TMDLs do not self-implement

- **Agricultural Order**
  - ✓ Surface and groundwater monitoring
  - ✓ Farm water quality plans
  - ✓ Report total N applied (tier 2 & 3, high risk crops)
  - ✓ Irrigation & nutrient management plans (tier 3)
- **NPDES stormwater permits**
- **NPDES wastewater permits**
- **Animal waste discharge prohibition**

algae mats. lower Pajaro River
June 2015
photo credit: Robert Ketley, City of Watsonville

Success Stories…

- Pajaro River Basin Prop 50 INM grant program – achieved substantial nitrogen load reductions via improved irrigation efficiency
- Environmental and water quality improvements in the Watsonville Slough system through conservation practices
- Nursery water reuse: tailwater recovery systems reduced water use and reduces nutrient runoff (Watsonville)
- Low flow sprinklers and soil moisture monitoring: reduced water use, reduced runoff and reduced erosion (Gilroy)

Growers and irrigation specialists discussing improving irrigation efficiency
Pajaro River basin INM workshop
Photo courtesy of: Dr. Michael Cahn, UC Cooperative Extension

Proposed TMDL Milestones…

10 year Interim Goal
Attain nitrate drinking water standard and toxicity objective in surface waters

TMDL re-opener:
Re-visit, re-consider, revise TMDL in 8 years, as appropriate based on new research and data

15 year Interim Goal
Attain wet-season biostimulatory targets in surface waters

25 year Final Goal
Attain more-stringent dry season biostimulatory targets in surface waters

San Juan Creek, June 2011
Pajaro River basin
Photo credit: Mary Hamilton

Public Comments…

1) **South County Regional Wastewater Authority (SCRWA)**

Mr. Saeid Vaziry, P.E., SCRWA Environmental Programs Manager

Requested a more generalized and management-oriented approach to implementing orthophosphate loading reductions

2) **U.S. Environmental Protection Agency (USEPA)**

Ms. Janet Parrish, USEPA Region IX TMDL liaison

Stated that USEPA supports and recommends adoption of these TMDLs

Millers Canal @ Frazier Lake Rd.
Pajaro River basin
June 2011
Photo credit: Mary Hamilton

Wrapping Up…

What are we trying to improve *and* protect?

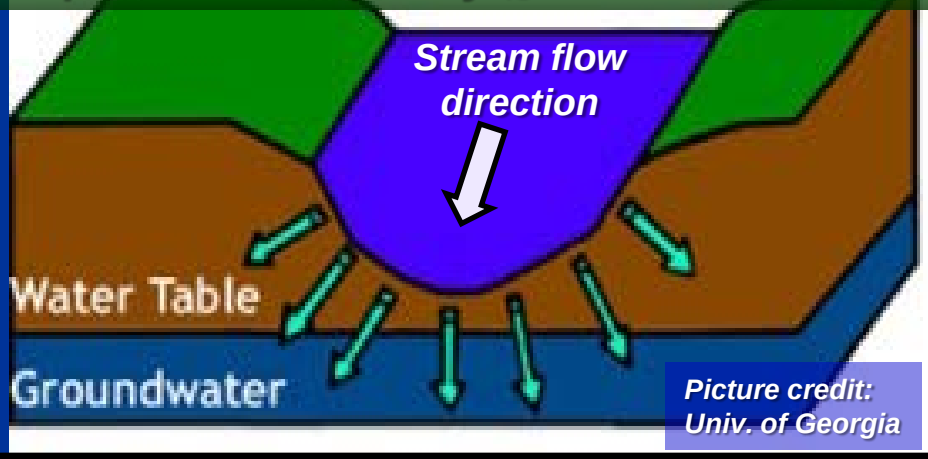
Viable freshwater habitat for fish, wildlife, invertebrates

Struve Slough
Pajaro River basin
Photo: M. Hamilton

Drinking water supply

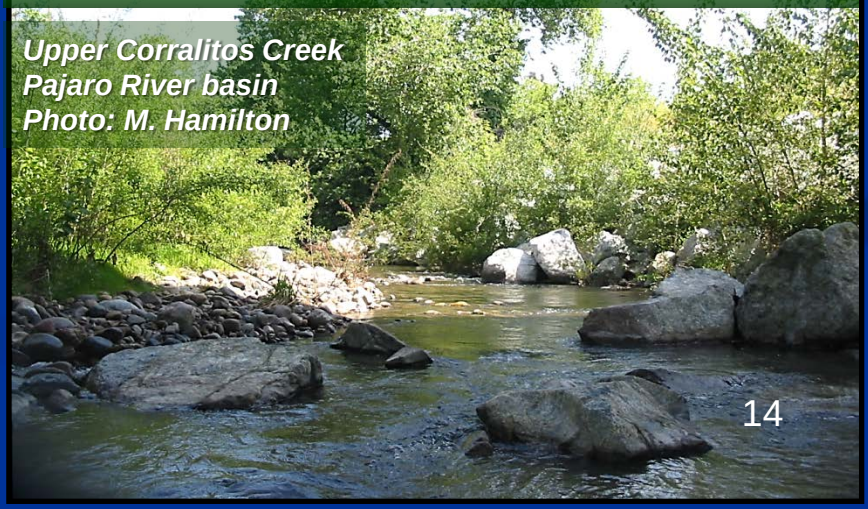
Photo Credit: USEPA

Aquifer water quality (groundwater recharge)



Picture credit: Univ. of Georgia

Protect existing high quality waters
Prevent any further degradation



Upper Corralitos Creek
Pajaro River basin
Photo: M. Hamilton

We Recommend Adoption of Resolution No. R3-2015-0004

Amend Basin Plan to incorporate…

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Pajaro River Estuary @ Pacific Ocean

Questions & Discussion…

Upper Uvas Creek
Pajaro River basin
Photo courtesy of Ron Horri