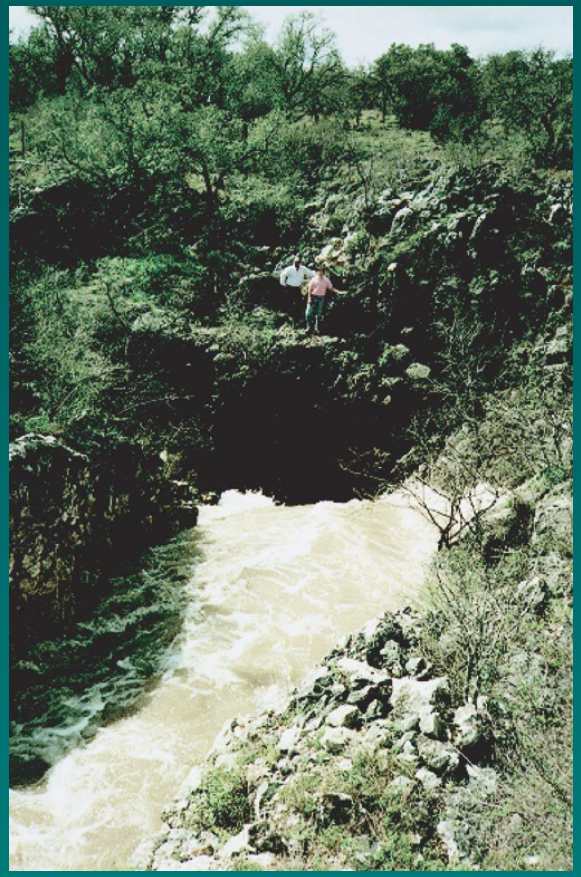
Making the Connections Between Ground Water and Surface Water

By Pixie Hamilton



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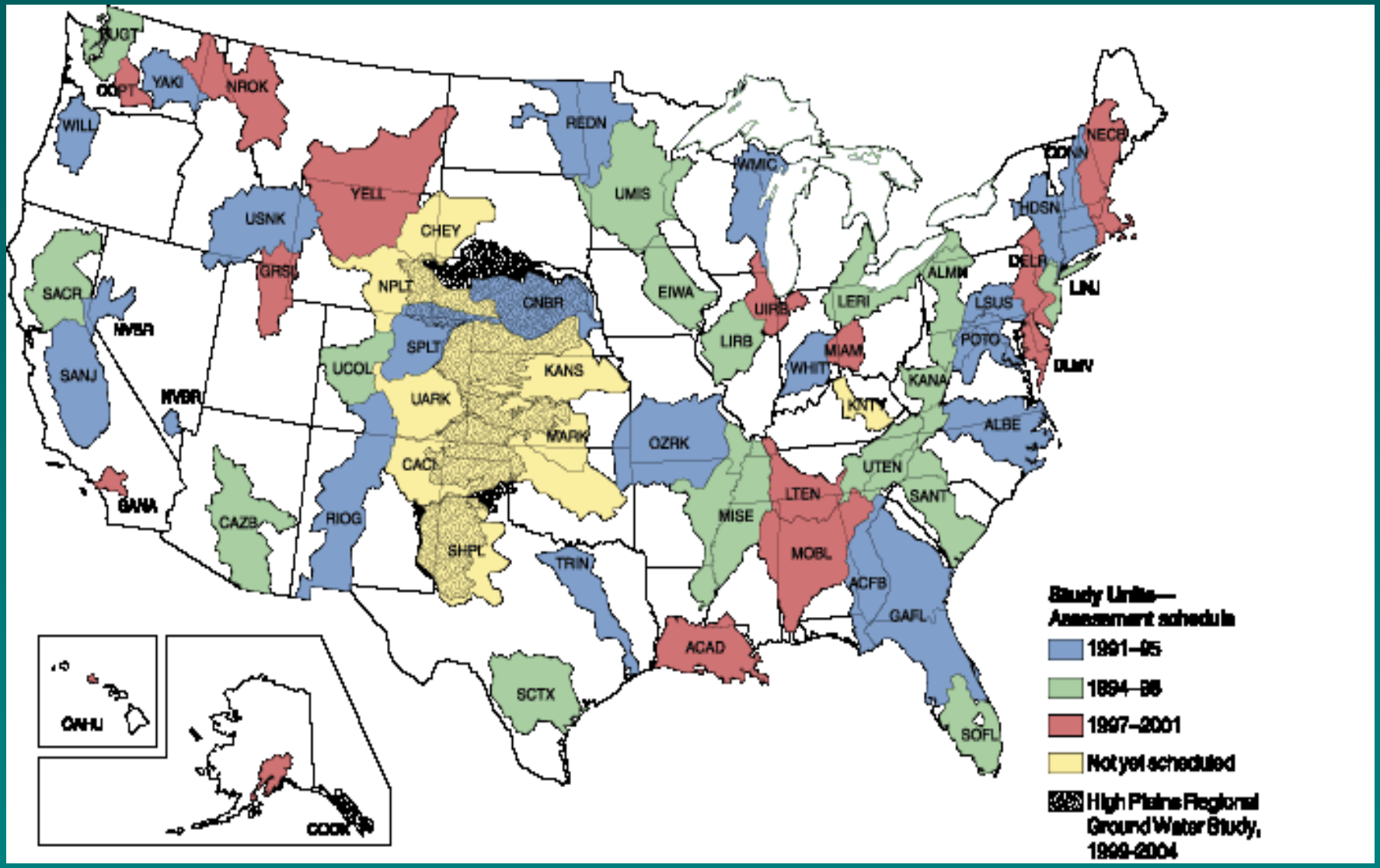
NAWQA Study Areas, 1991 - 2001



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Lay of the land matters

Exchanges are highly variable, and are governed by natural features, such as soils, geology, and hydrology.

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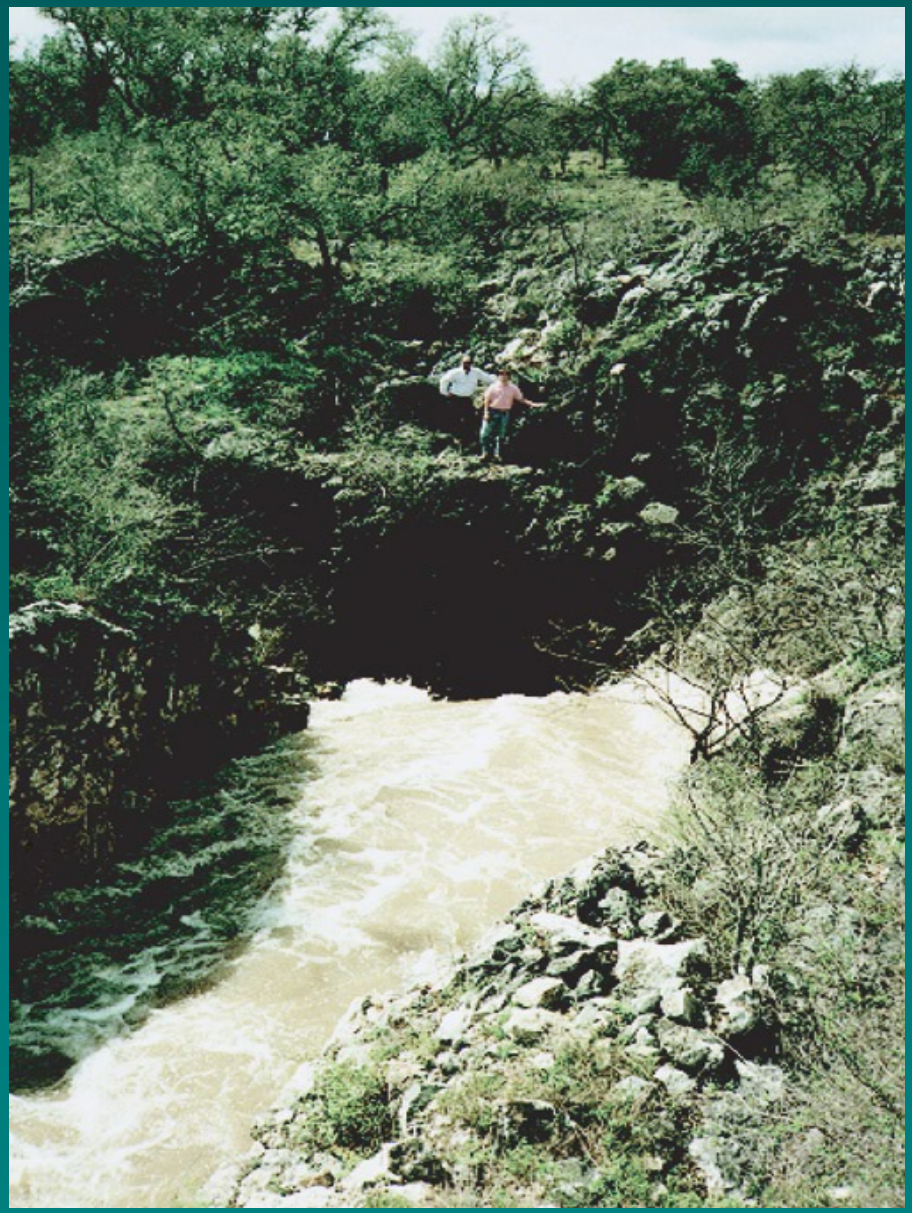
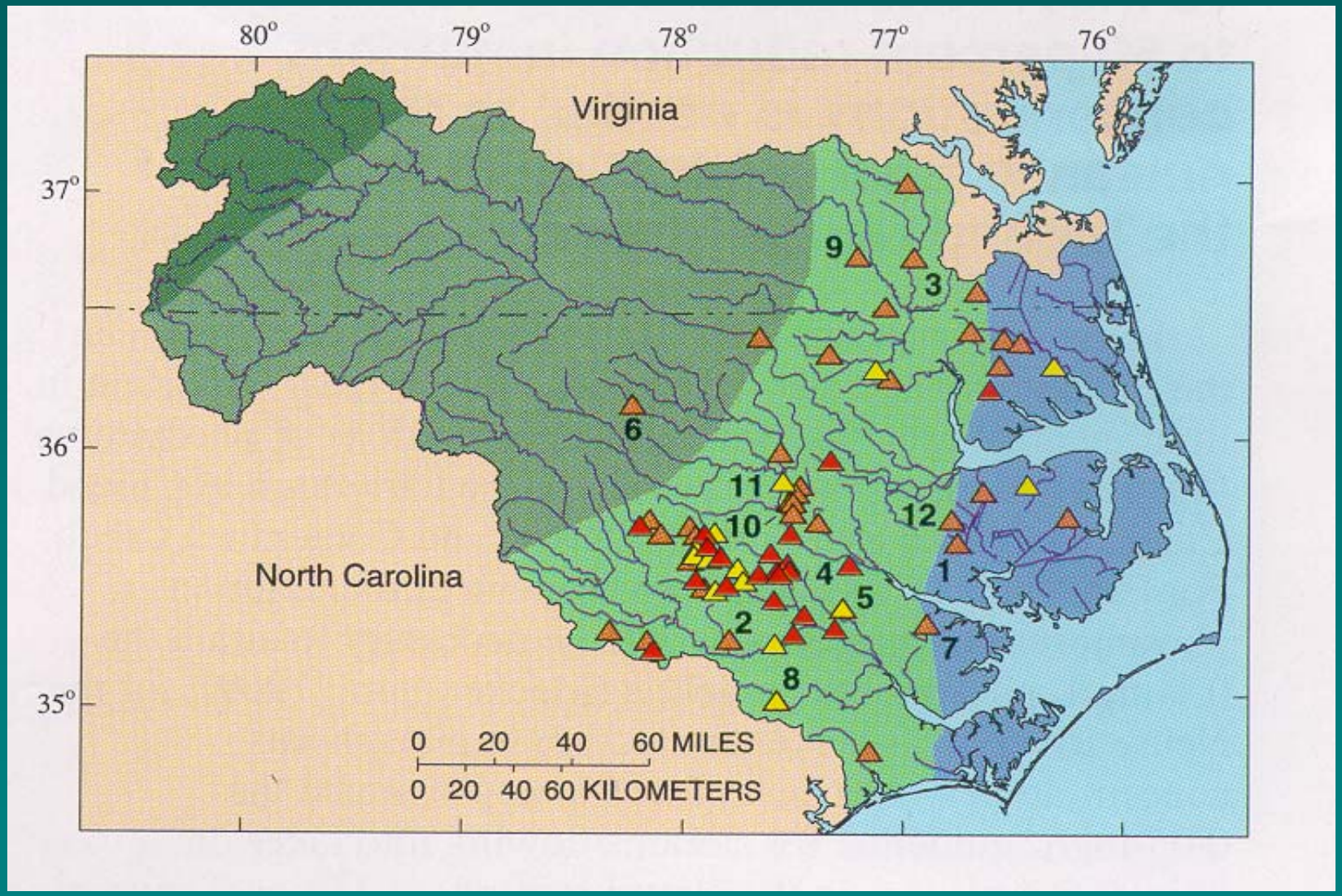
Exchanges are substantial in the highly permeable, faulted and fractured carbonate outcrop of the Edwards aquifer near San Antonio, Texas



Substantial exchanges in the carbonate system affect the aquatic health in parts of the Suwannee River in Florida

Naturally occurring phosphorus in ground-water discharge affects some streams in North Carolina



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The human impact

Pumping, land-management practices, and regulated water management can have large impacts on ground-water and surface-water interactions.

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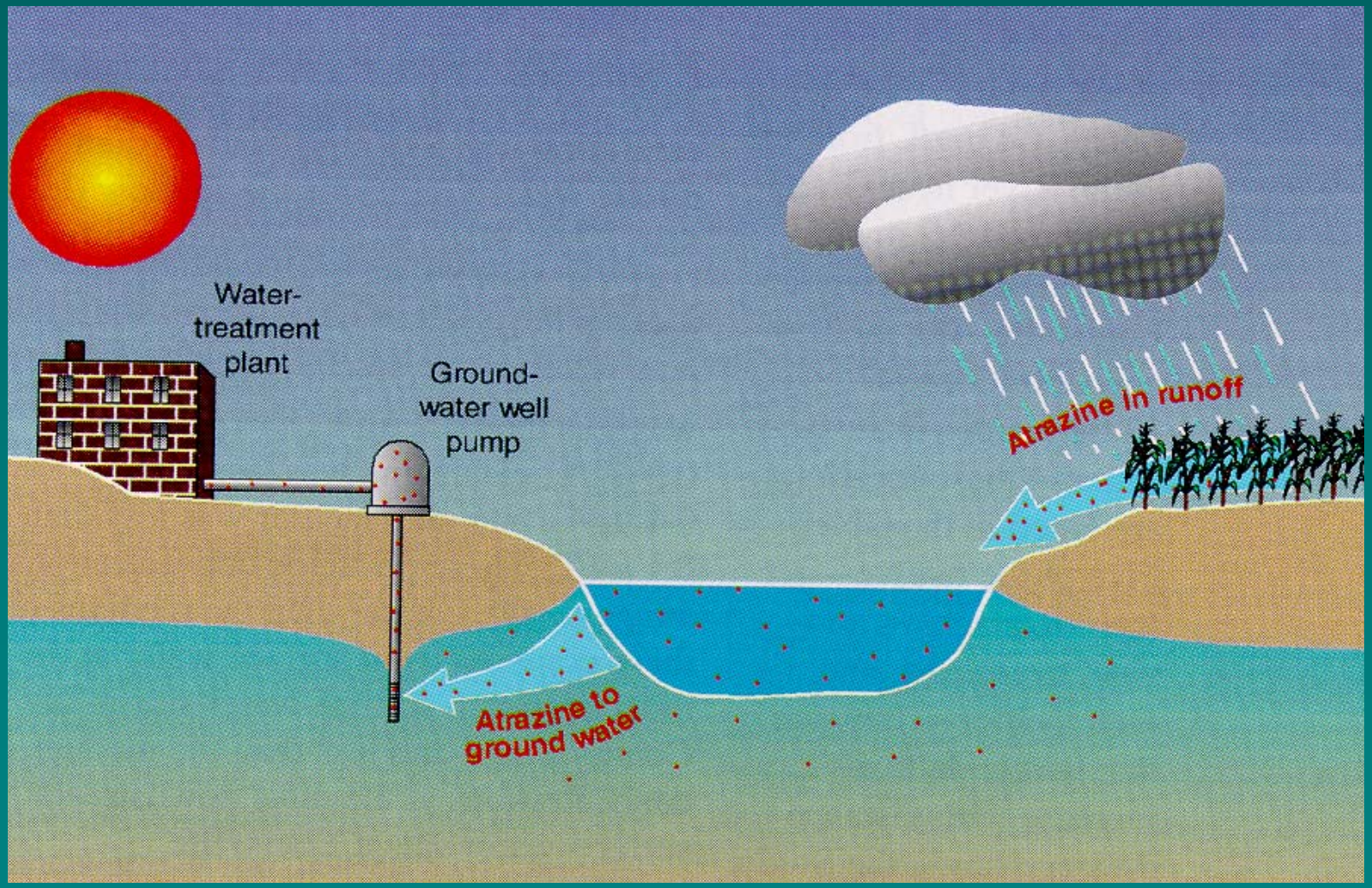
Large water-supply wells commonly are placed in alluvium adjacent to large streams and rivers in the Midwest



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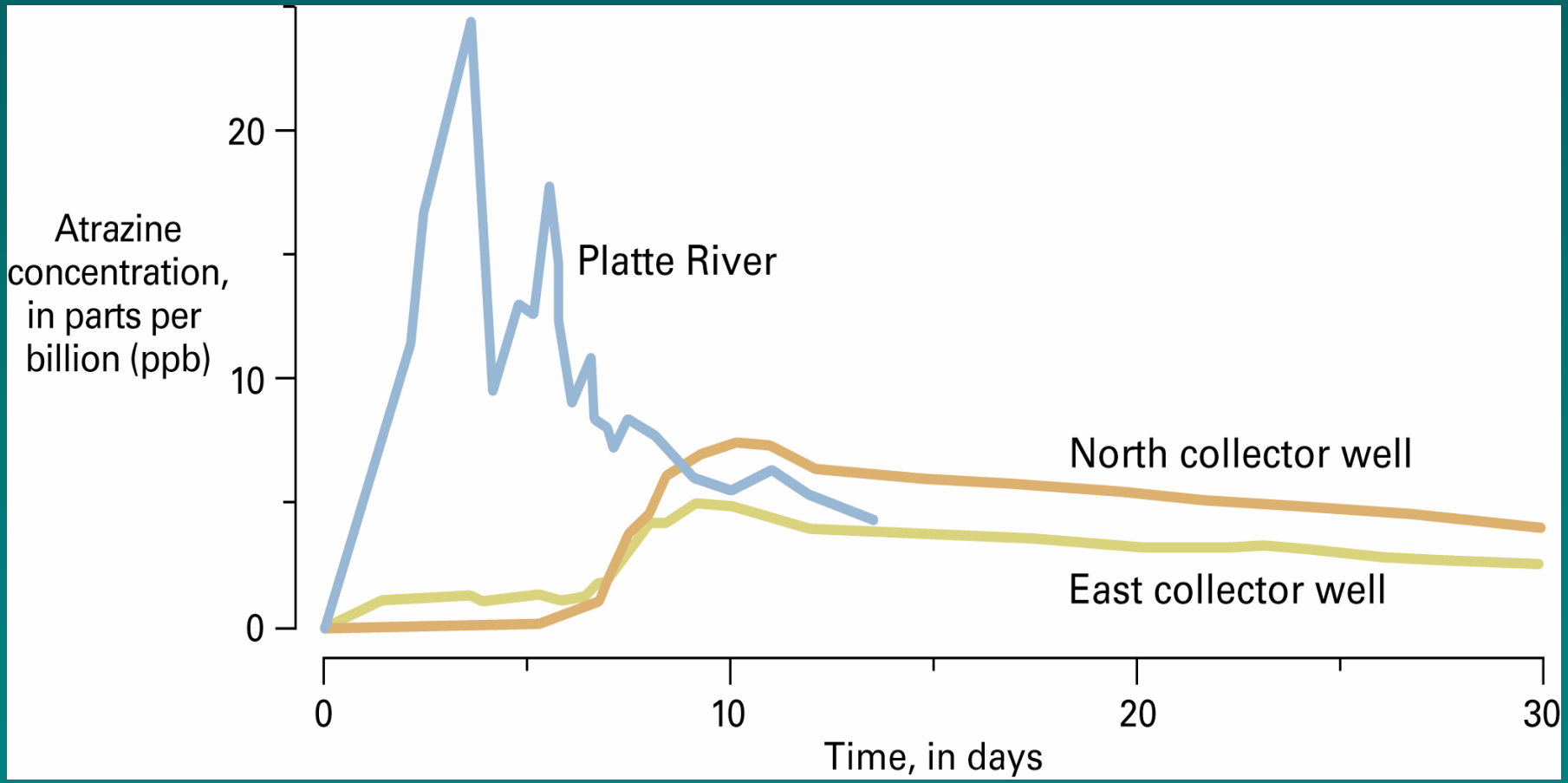
Platte River



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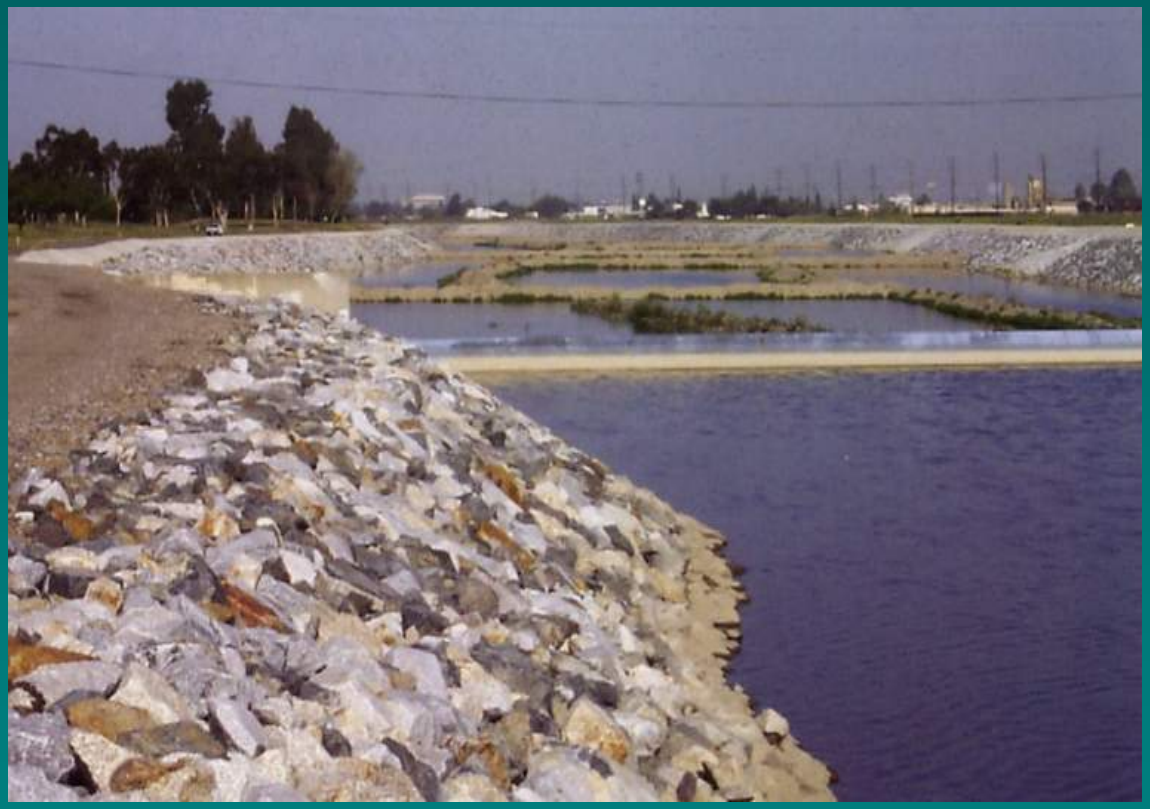
Land-management practices

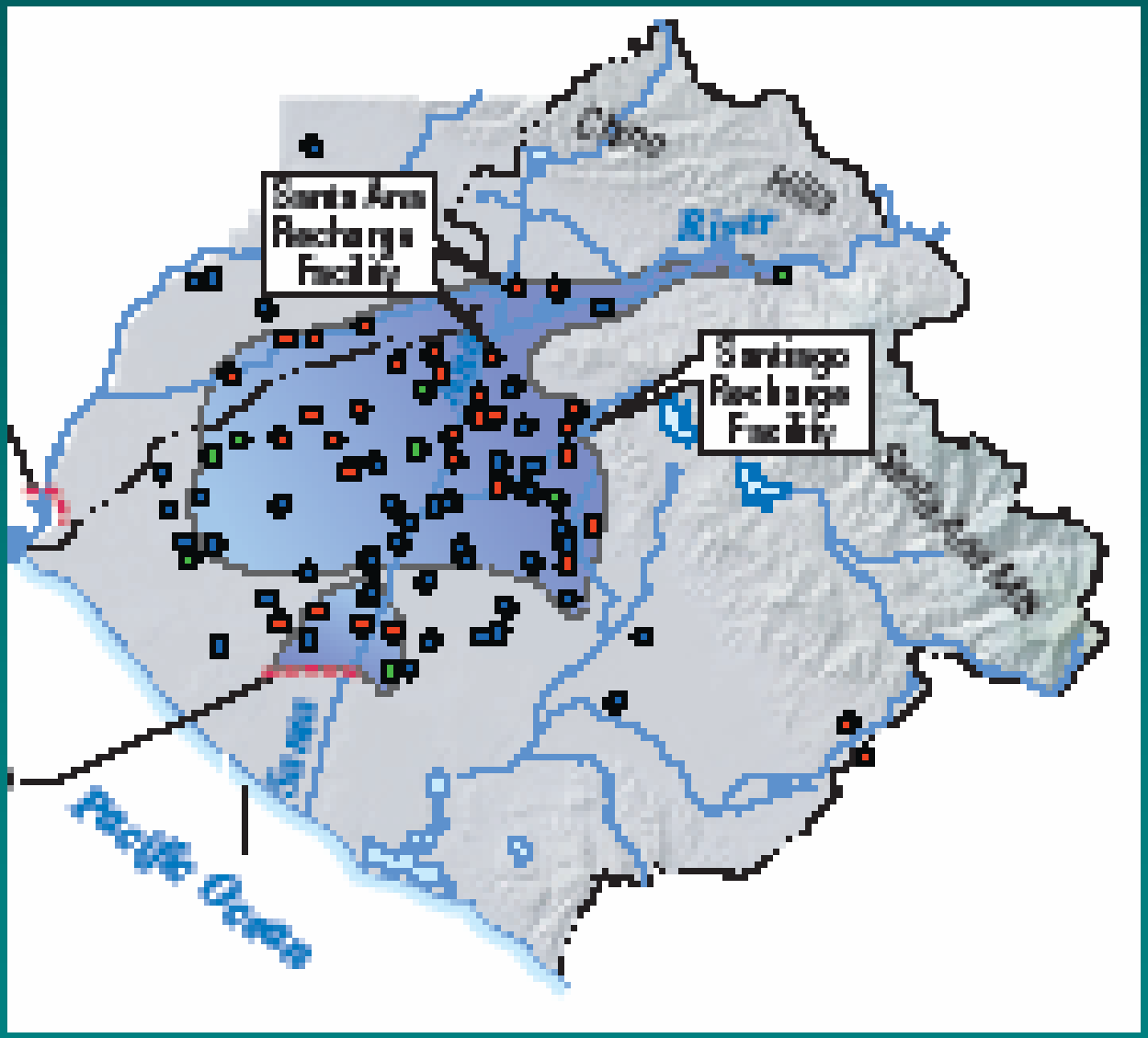
Tile drains and ditches, commonly used in the Midwest and southeast, can short-circuit the ground-water system

Regulated water management

Water managers capture flow in the Santa Ana River, California for recharging the ground-water system used for public supply.



Detectable chloroform is distributed throughout coastal ground water underlying the Santa Ana River Basin



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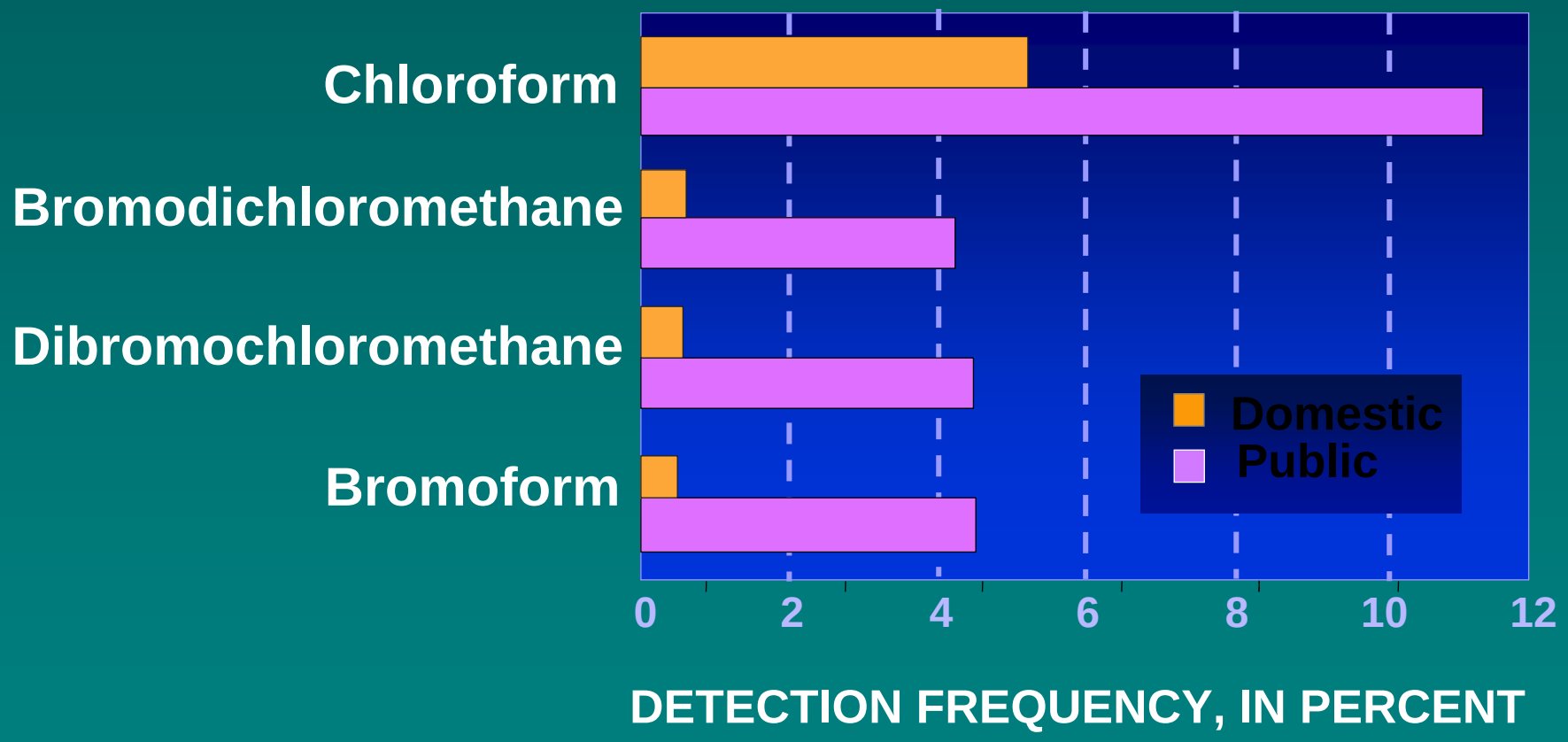
Chloroform and other THMs in domestic and public wells



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Message

Understanding the interactions of ground water and surface water is essential for protecting drinking water and stream ecosystems

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Ground water can be a major contributor to streams; quantifying the contribution is a critical step in meeting water-quality standards and criteria, issuing permits, meeting Clean Water Act goals for swimmable, fishable, and drinkable waters, and protecting ecosystem health.

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Surface water can be a major contributor and affect the quality of ground water, and should be considered in source-water management, artificial-recharge strategies, and well-head protection programs.

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Understanding the variability and complexities due to natural features and human impacts is critical in setting management and monitoring priorities to streams, aquifers, and watersheds most vulnerable to contamination.

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For More Information:

The NAWQA Program:

water.usgs.gov/nawqa

The USGS:

www.usgs.gov

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