

Texas Commission on Environmental Quality Environmental Monitoring and Response System

Targeting Field Investigations with
Continuous Water Quality Monitoring
in the Bosque/Leon River Watersheds

National Water Quality Monitoring Council

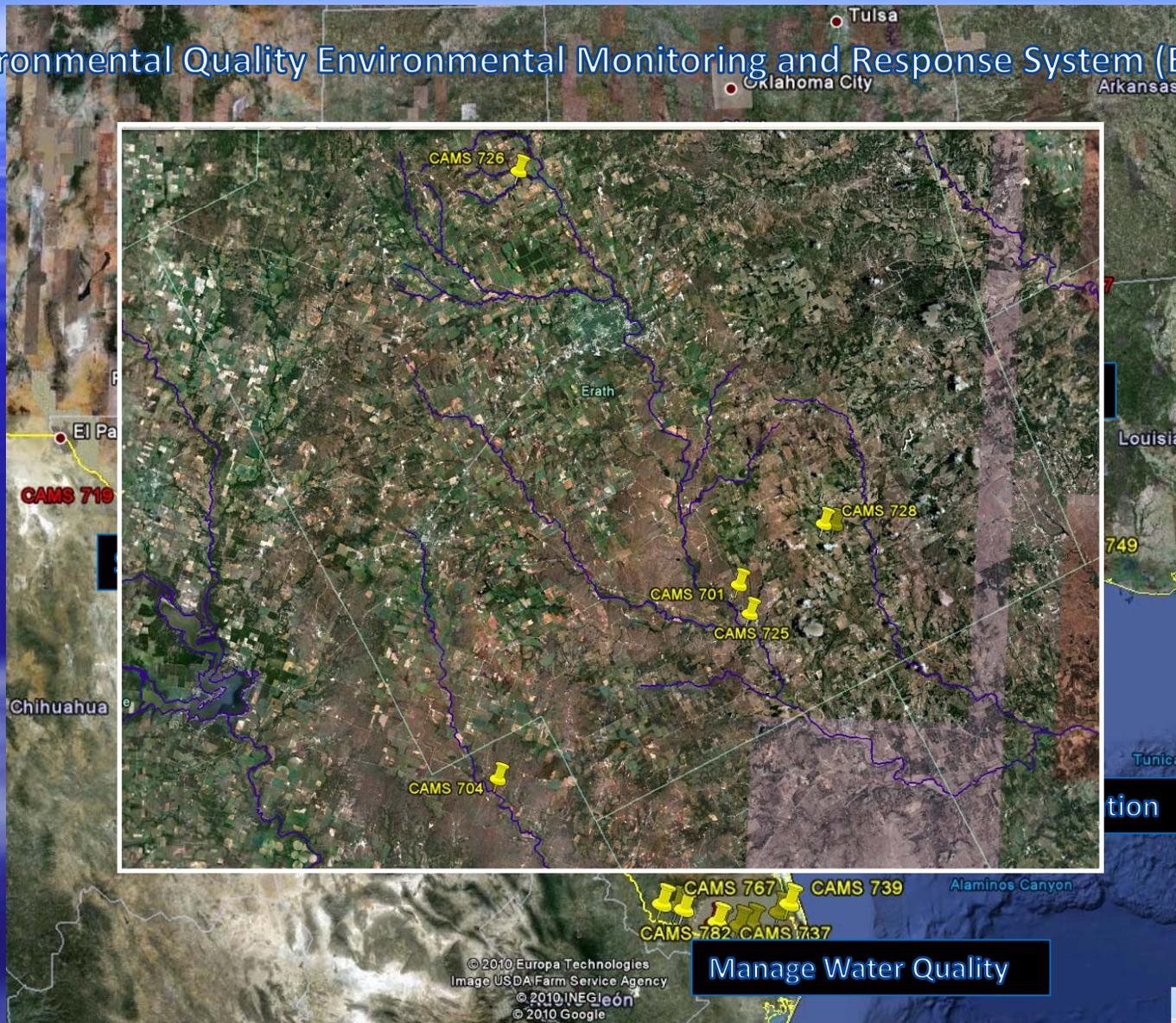
April 26, 2010

Seventh National Monitoring Conference - Monitoring From the Summit to the Sea



Continuous Water Quality Monitoring in Texas

Environmental Quality Environmental Monitoring and Response System (EMRS)



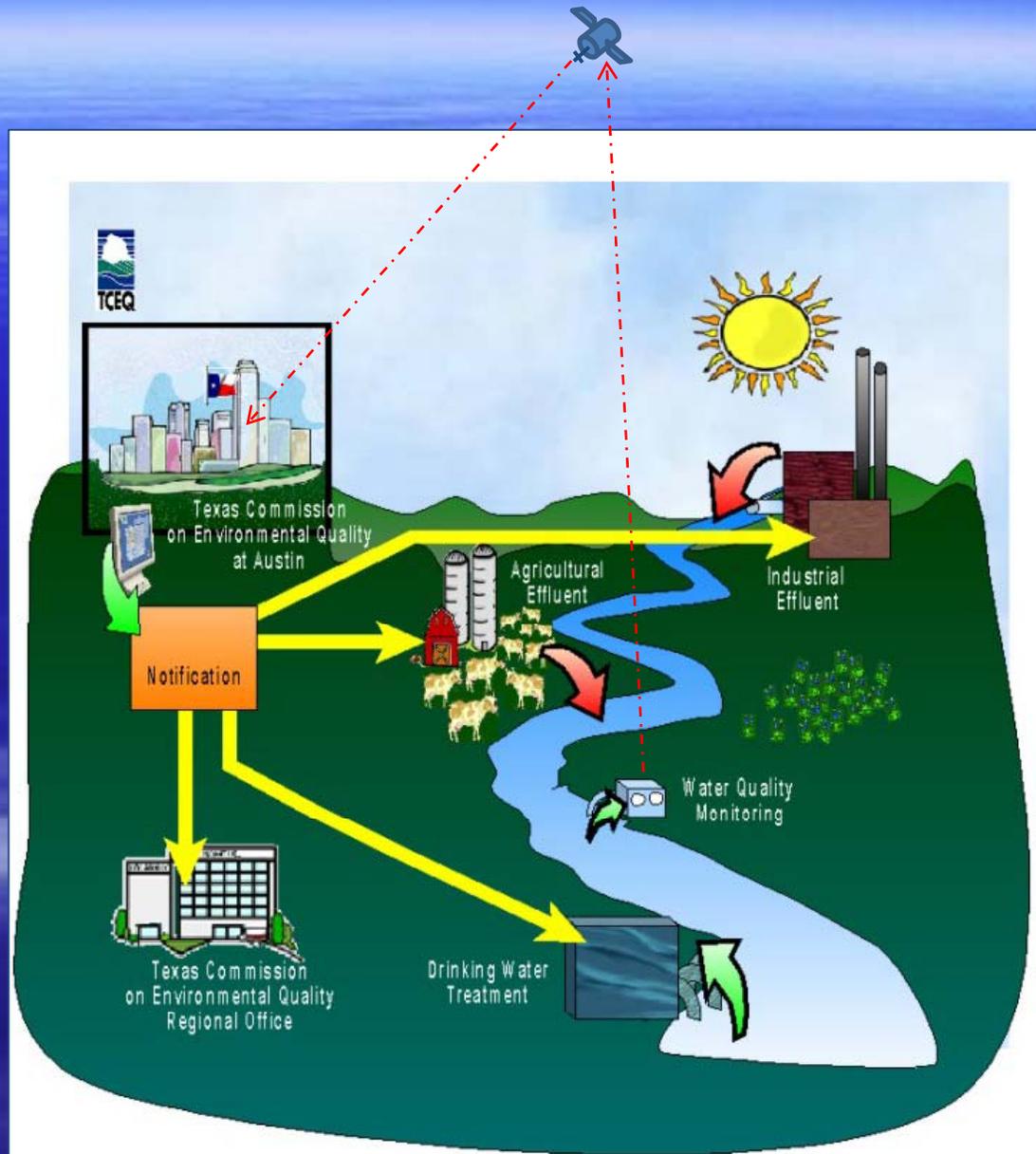
Environmental Monitoring and Response System Concept

Remote automated water quality monitoring systems collect and telemeter data to TCEQ.

Based on the data received, database sends electronic notifications to field staff to target AFO, CAFO, and WWTP investigations.

Data is not from NELAC Accredited lab and is not used directly for enforcement.

TAC Title 30, Part 1, Chapter 25,
Subchapter A, Rules 25.4 and 25.6



EMRS Phase I - Bosque/Leon Watersheds

First two sites deployed in the North Bosque River for physiochemical parameters (T, pH, DO, SC).

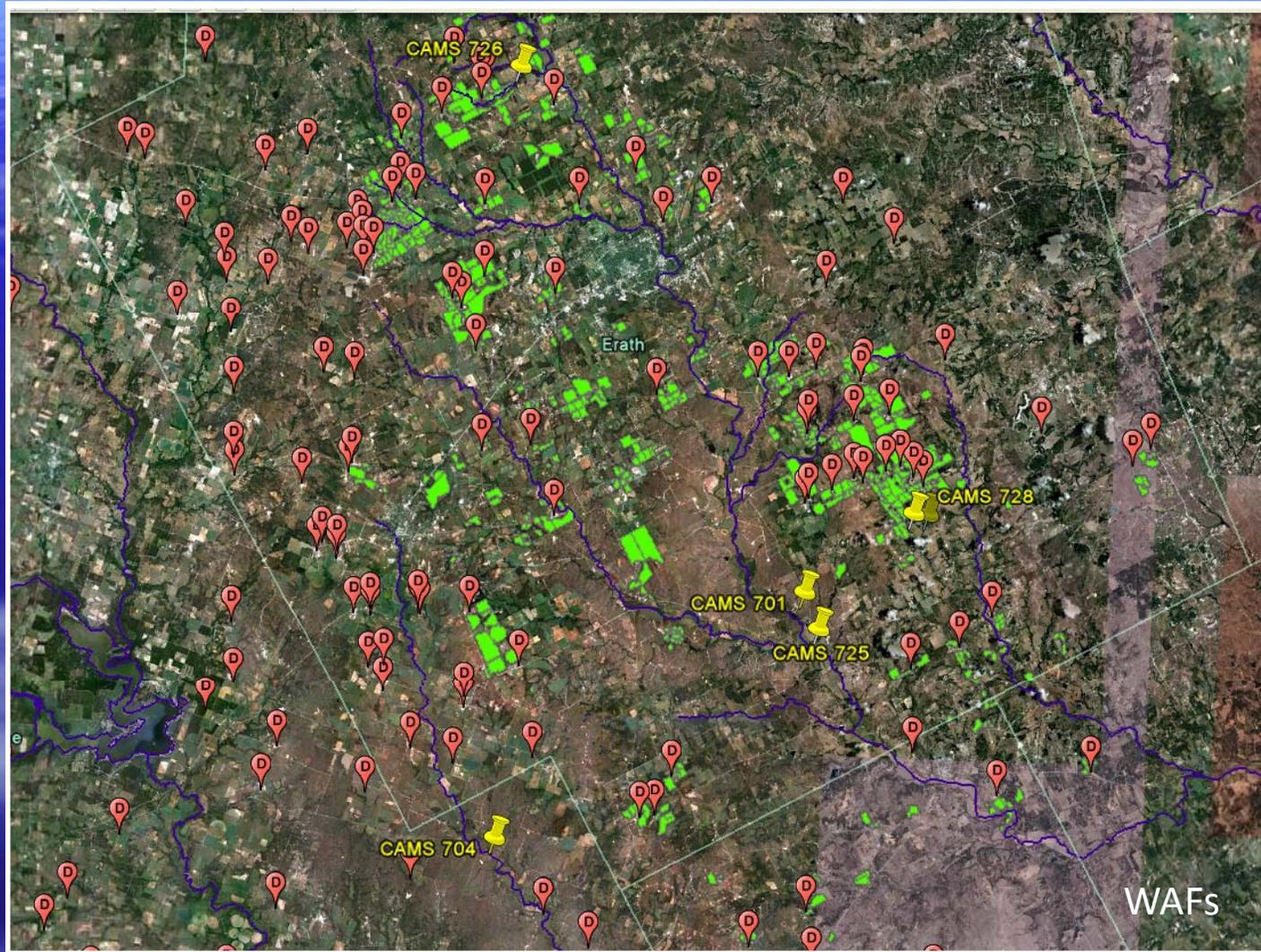
CAMS 701 at Green Creek deployed “near” multiple potential sources, and CAMS 702 at Clifton deployed as an integrator site near a TMDL index site in the N. Bosque River watershed.

CAMS 704 at Resley Creek deployed “near” multiple potential sources, and CAMS 703 at Gatesville deployed as an integrator site in the Leon River watershed.

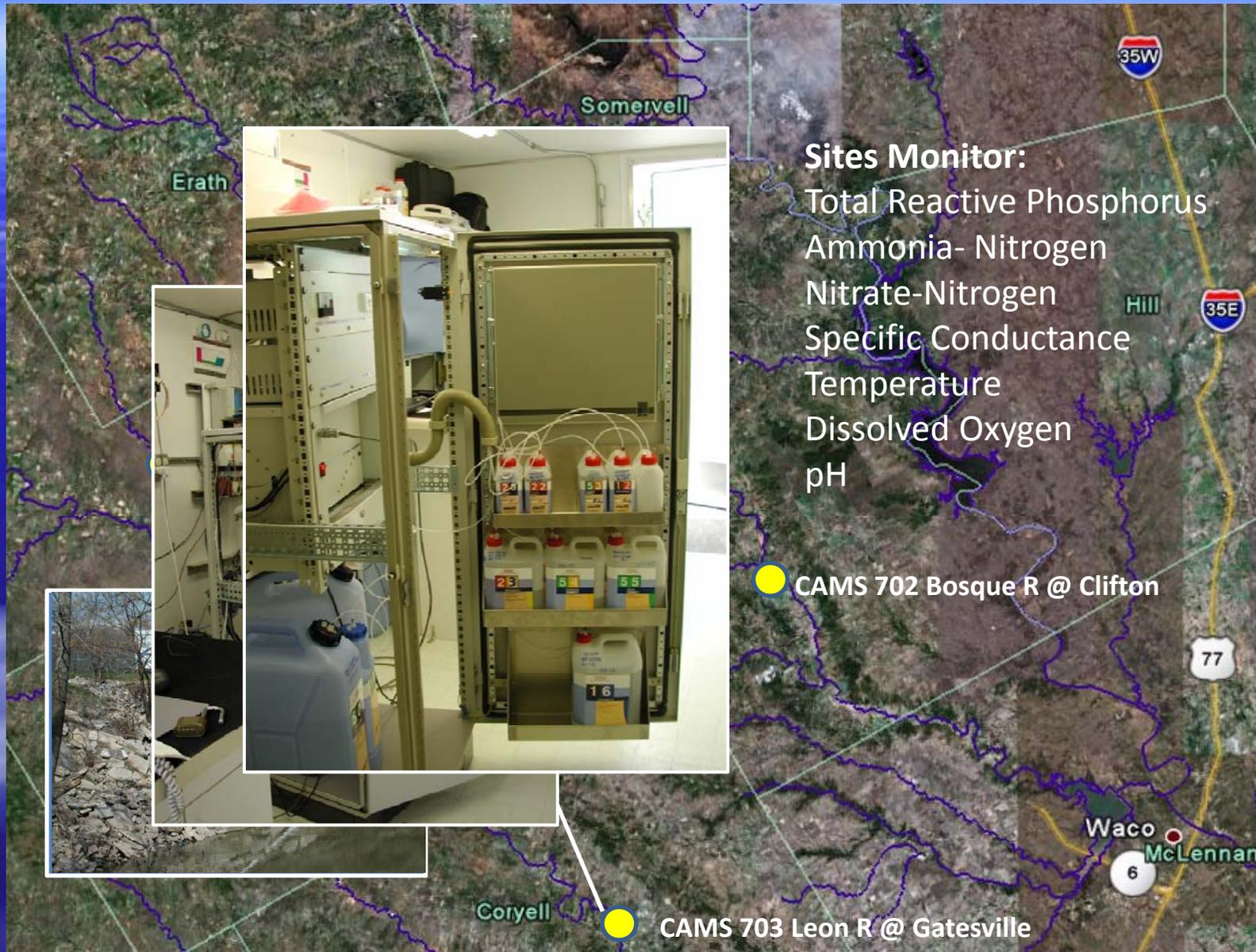
All four sites were later equipped with automated analysis of Total Reactive Phosphorus (TRP), Nitrate-Nitrogen (NO₃-N), and Ammonia-Nitrogen (NH₃-N).

“Trigger” levels were established for each site for nutrients.

Targeting Field Investigations with Continuous Water Quality Monitoring in the Bosque/Leon River Watersheds



Early Development of EMRS in the Bosque/Leon Watersheds



Early Results

EMRS sites were deployed and monitored nutrients and physiochemical parameters.

EMRS Data was telemetered to the TCEQ LEADS ingest and display system using wired or wireless communications.

EMRS email notifications were sent to field staff.

Field staff conducted field investigations in the watershed upstream of the source EMRS site.

Minimum of weekly Operation and Maintenance visits.

SUCCESS!

(Well, Sort of)

Early Results

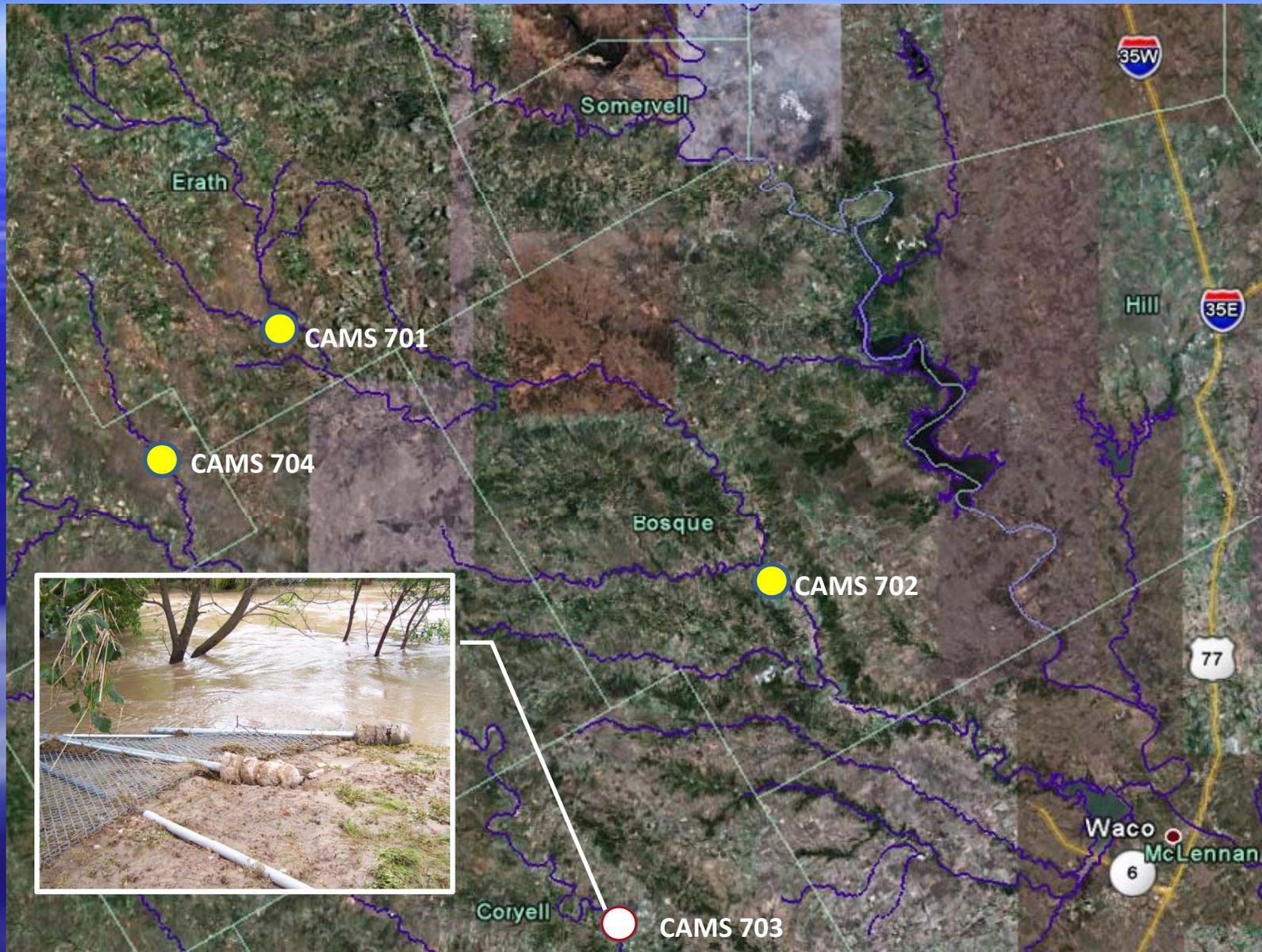
At this point, the successes were that continuous monitoring, telemetry, notification, and response were possible.

The watershed areas draining through the first four EMRS sites were far too large, with too many potential sources, and too many SCS impoundments to effectively target field investigations.

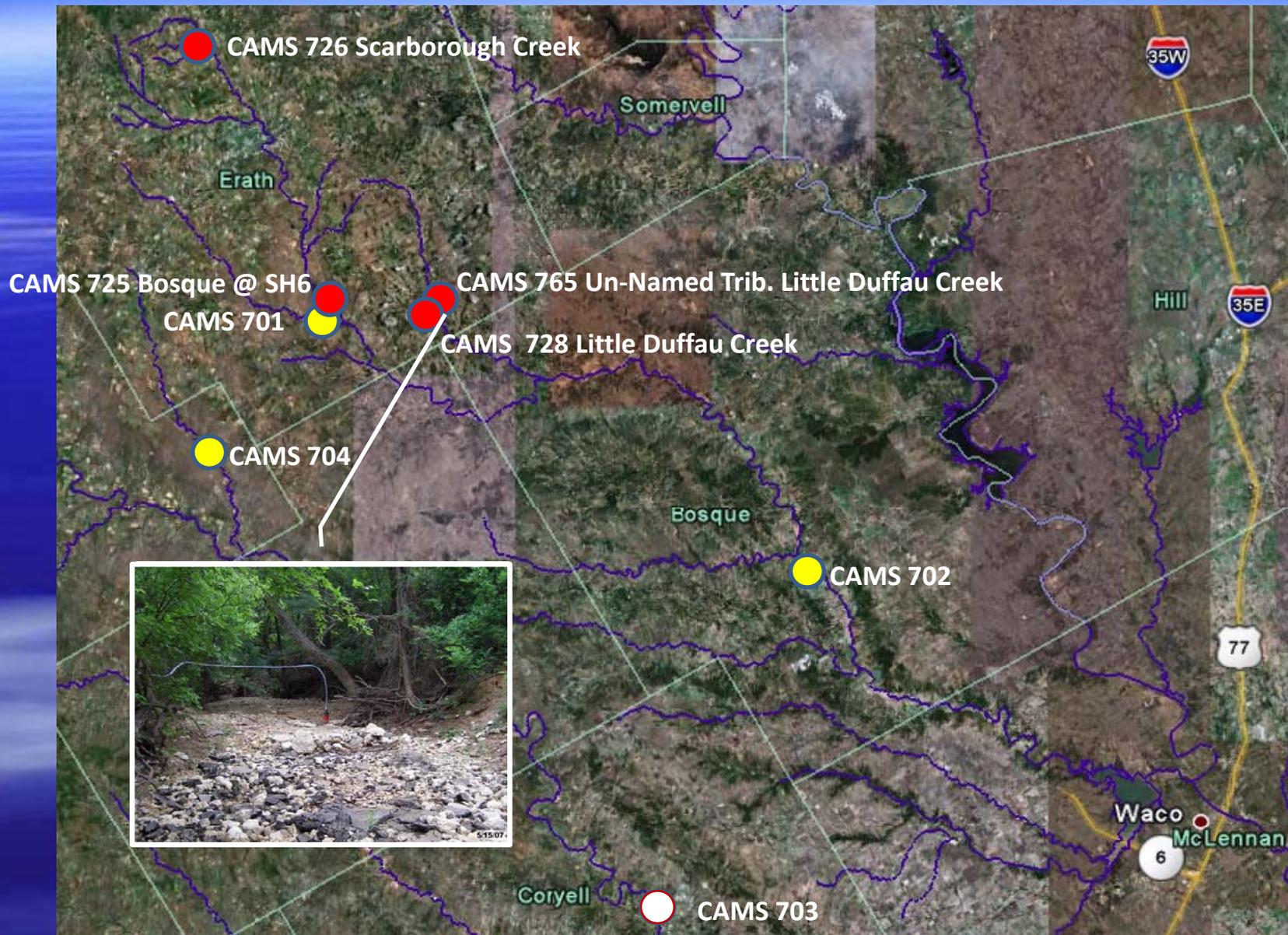
QA/QC was limited on the nutrient analyzers, relying on check-counts that provided a crude measure of analyzer performance.

Check-counts didn't tell us very much about the quality of the data.

Back To The Drawing Board



Back To The Drawing Board – EMRS Phase II



EMRS Phase II

EMRS sites on dry streams were designed and programmed to perform daily QC then goes to sleep unless the water rises.

Equipment Blank (EB) and Laboratory Control Samples (LCS) Capabilities were developed to document data quality.

EB and LCS reinforced need to perform routine maintenance.

EB and LCS data is accessed remotely to determine operational status prior to initiating investigations.

EMRS Phase II

Most common auto-analyzer problem is carry-over for TRP.

ISEs (NO₃-N and NH₃-N) are calibrated before each ambient measurement and verified after each ambient measurement.

Manufacturer's US rep is stretched pretty thin. Parts must often be ordered/shipped from Australia.

Targeted Field Investigations

The EMRS has been used effectively to target field investigations.

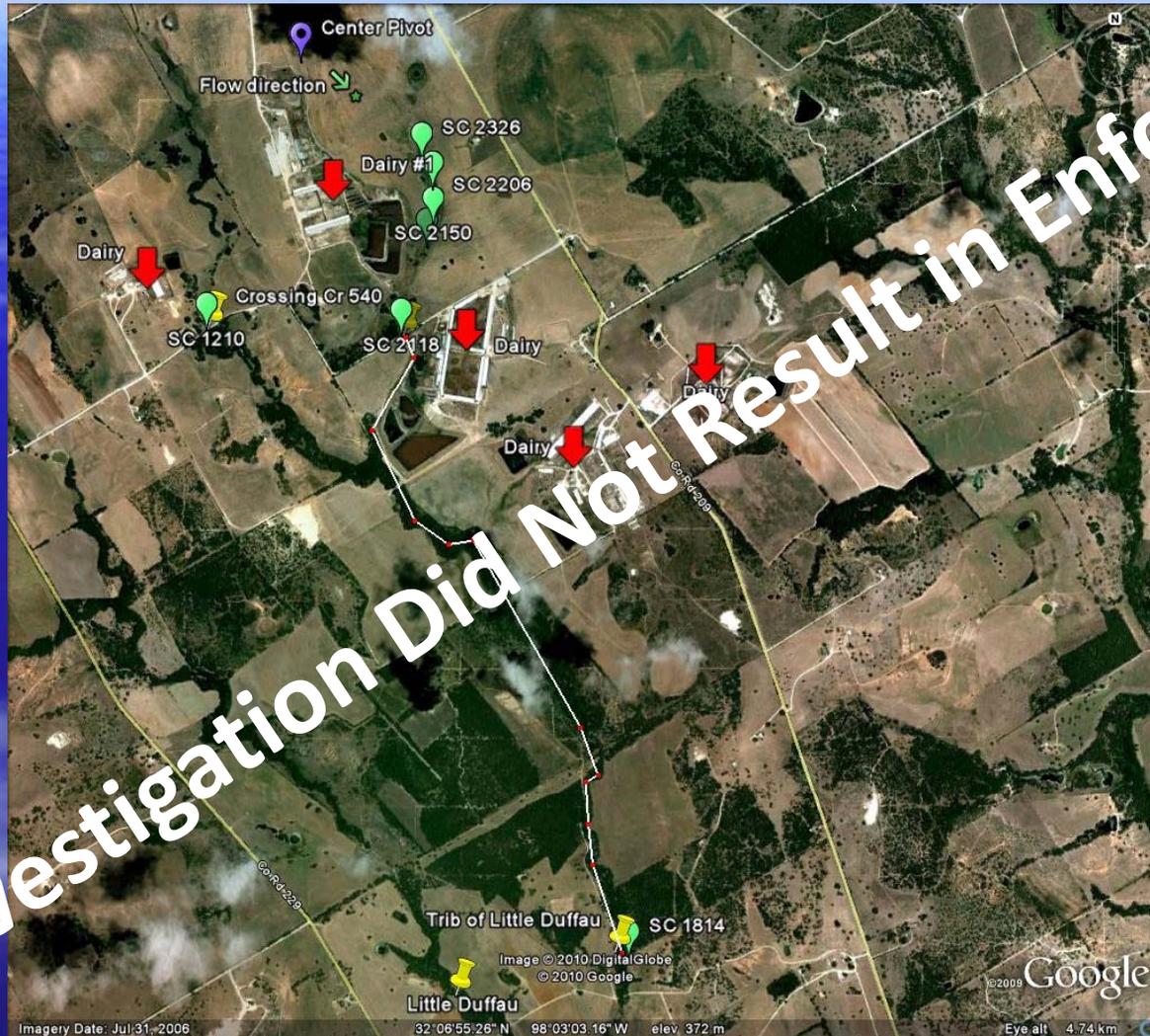
The successes have generally been from the Phase II micro-watershed sites.

Both Point and nonpoint sources have been identified by investigators using EMRS data to target field activities.

Several EMRS investigations have resulted in enforcement cases.

The EMRS data is not used in the enforcement cases; field investigators collect samples for laboratory analysis for enforcement.

Targeted Field Investigations



This Investigation Did Not Result in Enforcement

SC at These Sites is Normally 400-600 $\mu\text{S}/\text{cm}$

Results, Current, Status, and Plans

The CWQMN QAPP revisions indicate the data from EMRS sites are to target field investigations. Period.

The EMRS data is not appropriate for other assessment.

The EMRS data is not appropriate for enforcement.

Several successes in targeting field investigations in micro-watersheds.

SC could be an effective alternative to nutrients.

SC plus nutrients may be best to target investigations.

Results, Current, Status, and Plans

All CWQMN sites are now reviewed annually.

Based on reviews, sites may be:

- Continued
- Modified
- Deleted

Review of EMRS sites found strong support for:

- Scarborough Creek
- Little Duffau Creek
- Un-Named Tributary of Little Duffau Creek

Continue to pursue SC as alternative to nutrients.

Questions?

Chuck Dvorsky
CWQMN Coordinator
Texas Commission on Environmental Quality
Ph.: 512-239-5550
Email: cdvorsky@tceq.state.tx.us

