

**Arroyo Colorado Agricultural Nonpoint Source Assessment**  
**FY 06 CWA 319(h)**  
**TSSWCB Agreement No. 06-10-07-05**

Quarter no. 2 From 4/01/07 Through 6/30/07

**I. Abstract**

Due to overlap of membership and to ensure coordination with the ongoing efforts of implementing the Arroyo Colorado Watershed Protection Plan, the Watershed Partnership Ag Issues Workgroup was revamped after almost a year of inactivity to serve as the Ag Monitoring Oversight Committee and guide future efforts to assist the ag sector with implementation of the watershed protection plan. The first meeting is scheduled for July 24, 2007 and will be held in coordination with the Arroyo Colorado Partnership and other work group meetings scheduled for that day. Extensive work has been completed to obtain information to be used to update the land use information for the watershed. The Spatial Sciences Lab is aggressively working to complete the development of this information in order to be able to provide it to the Arroyo SWAT Modeling effort expected to be initiated next quarter. TWRI has also worked hard to finalize the QAPP so that monitoring efforts may be initiated. In the meantime, project investigators have extensively worked on setting up the monitoring effort and coordinated these activities with the Watershed Coordinator and the regional TSSWCB office. TWRI, along with the project Investigators, will present the QAPP to the Ag Issues Workgroup on July 24. Once Workgroup comments have been incorporated, the QAPP will be submitted to the TSSWCB. Monitoring and evaluation of BMPs will be initiated immediately upon approval of the QAPP by the TSSWCB and EPA.

**II. Overall Progress and Results by Task**

**TASK 1: Project Coordination and Administration**

*Subtask 1.1: TWRI will organize an Ag Monitoring Oversight Committee to coordinate project efforts with all project participants. This Committee will be composed of TAES, TAMUK, TCE, TCEQ, TDA, Texas Sea Grant, TSSWCB, Nueces River Authority, producer groups, irrigation districts, and drainage districts. This Committee will meet at least semi-annually to discuss project status, provide input on monitoring design, coordinate project activities, and coordinate monitoring efforts with educational activities.*

The following actions have been completed during this reporting period:

- a. Members of the Arroyo Colorado Watershed Partnership Ag Issues Workgroup will serve as the Ag Monitoring Oversight Committee. This eliminates duplication of effort and ensures involvement of TAES, TAMUK, TCE, TCEQ, TDA, Texas Sea Grant, TSSWCB, Nueces River Authority, producer groups, irrigation districts, and drainage districts. The current membership list is included in Appendix A.

- b. A meeting of the Arroyo Colorado Watershed Partnership Ag Issues Workgroup has been scheduled for July 24, 2007 from 9:00 am till noon at the TAMU-Kingsville Citrus Center in Weslaco.
- c. The draft QAPP will be presented to the Ag Issues Workgroup at this meeting to obtain Workgroup comments on the document.

**17% Complete**

*Subtask 1.2: TWRI will prepare electronic quarterly reports for submission to the TSSWCB. All progress reports will be provided to the Ag Monitoring Oversight Committee [Final report provided under Task 8].*

The following actions have been completed during this reporting period:

- a. Submitted Year 1, Quarter 2 Report on July 16, 2007.

**17% Complete**

*Subtask 1.3: Monitoring results will be transferred to TCE and TAES for development of educational materials and presentation to stakeholders. Based on the results of the monitoring, TCE will hold workshops demonstrating the impacts of implementing BMPs in the watershed and coordinate periodic meetings of ag producers to bring awareness concerning the impact of the drainage ditches on the mitigation of pollutants from the fields (the educational activities are funded under a FY05 project).*

The following actions have been completed during this reporting period:

- a. Nothing to report at this time.

**0% Complete**

*Subtask 1.4: TWRI will attend meetings with the TSSWCB project manager and other meetings, as needed, to review project status, deliverables, etc. During quarters when no Ag Monitoring Oversight Committee are scheduled, TTVN meetings will be conducted with project participants to discuss project activities, project schedule, lines of responsibility, communication needs, and other requirements*

The following actions have been completed during this reporting period:

- a. Nothing to report at this time.

**10% Complete**

*Subtask 1.5: TWRI will participate in Arroyo Colorado Partnership and Arroyo Colorado Agricultural Issues Work Group Meetings.*

The following actions have been completed during this reporting period:

- a. Arroyo Colorado Partnership and Arroyo Colorado Agricultural Issues Work Group Meetings have been scheduled for July 24, 2007. TWRI will actively participate in both of these meetings.

**0% Complete**

*Subtask 1.6: TWRI will submit appropriate Reimbursement Forms.*

The following actions have been completed during this reporting period:

- a. TAES submitted an invoice in the amount of \$41,116.19 covering all TAES expenses to April 30, 2007.

**17% Complete**

*Subtask 1.7: TWRI will develop (Months 1-3), host and maintain (Months 3-36) an internet website for the dissemination of information on educational, monitoring and demonstration activities taking place across the Arroyo Colorado watershed. Website delivery of information will be the most time and cost effective way to disseminate information to interested people or groups.*

The following actions have been completed during this reporting period:

- a. A website is being developed covering all activities in the Arroyo Colorado. The Arroyo Colorado Ag Assessment Project will be one of the projects covered under this website. This will be more convenient for users to be able to find out all the activities in the watershed by accessing one site. To ensure consistency between the previously developed web site for the Arroyo Colorado, TWRI is working with Sea Grant to obtain the files and permission to transfer the site to TWRI's server. However, because Sea Grant originally developed the Web site, TWRI has not been able to obtain the files as quickly as desired and thus, getting the website online has been delayed. It is expected to be online next quarter.

**5% Complete**

## **TASK 2: Compilation and Evaluation of Prior Studies and Data**

*Subtask 2.1: TWRI, with assistance from members of the Ag Monitoring Oversight Committee, will compile historical water quality data and information from previous studies and conduct a detailed analysis of the most significant water quality parameters to investigate the trends and the different biological and physical process taking place in the watershed that contribute to changes in water quality in the Arroyo*

The following actions have been completed during this reporting period:

- a. Nothing to report at this time.

**0% Complete**

*Subtask 2.2: TWRI, with assistance from members of the Ag Monitoring Oversight Committee, will organize the results from the earlier non-point source pollution projects conducted in the Arroyo Colorado watershed and summarize the results and conclusions of these studies.*

The following actions have been completed during this reporting period:

- a. Nothing to report at this time.

**0% Complete**

*Subtask 2.3: TWRI, with assistance from members of the Ag Monitoring Oversight Committee, will identify critical data gaps that should be filled.*

The following actions have been completed during this reporting period:

- a. Nothing to report at this time.

**0% Complete**

*Subtask 2.4: TWRI will transfer results to TCE to be used to develop educational material through the FY05 Arroyo Education Project.*

The following actions have been completed during this reporting period:

- a. Nothing to report at this time.

**0% Complete**

### **TASK 3: Inventory Conservation Practice Implementation**

*Subtask 3.1: TAES-Temple, with assistance from TCE, USDA-NRCS, USDA-FSA, the TSSWCB Harlingen Regional Office, and the SWCDs, will identify all producers in the watershed.*

The following actions have been completed during this reporting period:

- a. Nothing to report at this time. A trip to the Valley is planned for next quarter to initiate data collection efforts.

**0% Complete**

*Subtask 3.2: TAES-Temple, with assistance from TCE, USDA-NRCS, USDA-FSA, the TSSWCB Harlingen Regional Office, and the SWCDs, will compile information on the location and types of Conservation Practices implemented in the Arroyo Colorado Watershed since 1995. This will include, but not be limited to, practices implemented through the Environmental Quality Incentives Program (EQIP) and the Water Quality Management Plan (WQMP) Program.*

The following actions have been completed during this reporting period:

- b. Nothing to report at this time. A trip to the Valley is planned for next quarter to initiate data collection efforts.

**0% Complete**

*Subtask 3.3: TAES-Temple will assemble a geo-referenced database and develop a map (hard copy and electronic) displaying conservation practice implementation information collected in Subtask 3.2.*

The following actions have been completed during this reporting period:

- c. Nothing to report at this time. A trip to the Valley is planned for next quarter to initiate data collection efforts.

**0% Complete**

*Subtask 3.4: TAES-Temple will transfer the information from Subtask 3.1 and Subtask 3.3 to TCE for use in targeting educational activities.*

The following actions have been completed during this reporting period:

- a. Nothing to report at this time.

**0% Complete**

*Subtask 3.5: TAES-Temple will identify areas needing priority implementation work through correlation with Task 4 and the results from Tasks 6-9.*

The following actions have been completed during this reporting period:

- a. Nothing to report at this time.

**0% Complete**

#### **TASK 4: Update Land Use/Land Cover Data**

*Subtask 4.1: The Spatial Sciences Lab (SSL) will obtain 1998 LULC for the Arroyo Colorado Watershed from TCEQ and all data used to produce it. Coordinate with TPWD and the Habitat Work Group to obtain relevant recent LULC data. Identify the major changes from 1998 to 2005.*

The following actions have been completed during this reporting period:

- a. NPDES permits were downloaded from the EPA Permit Compliance System website. Data downloaded included: air emissions, hazardous waste, toxic release, waste water facilities, waste water NHD locations, water dischargers and multi activity sites. See Appendix B.

**33% Complete**

*Subtask 4.2: SSL will obtain 2003 LANDSAT ETM+ Data, Path 26/ Row 42 and Path 27/ Row 42. Proceed to image classification at a level equivalent to the MRLC classification to level 2.*

The following actions have been completed during this reporting period:

- a. LANDSAT data was received from Bryan Crook of USDA FSA. Path/Row/Quad 271/054/B was dated 7/16/06. The imagery includes bands 2, 3, 4 and 5.
- b. LANDSAT data has been resized on all bands to a buffered border of the watershed boundary (Appendix B). Several different variations of unsupervised

classifications have been made on all the bands of the data. Included in Appendix B is an isodata classification on band 2 with twelve classes derived.

**33% Complete**

*Subtask 4.3: If available, SSL will obtain applicable digital data on cropland from USDA – FSA and add up to level 2 classification.*

The following actions have been completed during this reporting period:

- a. Digital data on croplands and crop history from USDA FSA is in the process of being gathered from Bryan Crook.

**10% Complete**

*Subtask 4.4: If available, SSL will obtain digital location data on citrus production from USDA-APHIS and add up to level 2 classification.*

The following actions have been completed during this reporting period:

- a. Wes Rosenthal from TAES-Temple and Andy Garza from TSSWCB were both contacted regarding information; however, neither had the data or knew of contacts.
- b. The Citrus Mutual general website was contacted as well as Ray Prewett the President. No response has been received from either to date.
- c. Reginald S. Fletcher from USDA – Weslaco sent SSL to David Bartels and Russell Sheetz of USDA APHIS PPQ. Both were emailed; however, no response has been received. Mr. Bartels and Mr. Sheetz appear to be the creators of the original layer.
- d. David Bartels was reached by phone and it appears that SSL can get the citrus file from him.

**5% Complete**

*Subtask 4.5: If available, SSL will obtain digital data on locations of sugarcane fields from sugar mill and add up to level 2 classification.*

The following actions have been completed during this reporting period:

- a. Sugarcane field data was obtained from Sam Gonzales, the Agricultural Services Coordinator of Rio Grande Valley Sugar Growers Inc. See Appendix B.

**33% Complete**

*Subtask 4.6: SSL will obtain 2004 1m DOQ for Cameron, Hidalgo and Willacy counties. Improve the level 2 classification to a level 4 classification by manual digitalization.*

The following actions have been completed during this reporting period:

- a. 2004 NAIP imagery was pulled from the archive of the Spatial Sciences Laboratory.

**33% Complete**

*Subtask 4.7: SSL will obtain most recent digital data from irrigation districts and add up to level 4 classification.*

The following actions have been completed during this reporting period:

- a. Irrigation districts, irrigation networks and water storage were obtained from Irrigation District Engineering and Assistance Program.
- b. Yearly crop yield data was received from UID, CCID#2 and Harlingen IDCC#1 irrigation districts. Many others were contacted with no return response.

**33% Complete**

*Subtask 4.8: SSL will obtain 1998 tile drainage data and if available, obtain updated data from TSSWCB and TCE.*

The following actions have been completed during this reporting period:

- a. Wes Rosenthal from TAES-Temple and Andy Garza from TSSWCB were both contacted regarding information; however, neither had the data or knew of contacts.
- b. SSL is having difficulty in obtaining tile drainage data.

**5% Complete**

*Subtask 4.9: SSL will obtain 1998 data on colonia and if available, obtain updated data from TWDB. Superpose colonia data to level 4 classification.*

The following actions have been completed during this reporting period:

- a. Colonia location data was sent by David Falk, Chief, Legal and Technical Support Division of the Texas Office of Attorney General. See Appendix B.

**33% Complete**

*Subtask 4.10: SSL will obtain 1998 data on non-colonia septic systems and if available, obtain updated data from Lower Rio Grande Valley Development Council (LRGVDC). Superpose non-colonia septic systems data to level 4 classification.*

The following actions have been completed during this reporting period:

- a. SSL emailed the LRGVDC general website as well as Kenneth Jones, the director, about the data and no response has been received to date.

**5% Complete**

*Subtask 4.11: SSL will obtain 1998 data on land Application and if available, obtain updated data from NPDES Permits. Superpose land application data to level 4 classification.*

The following actions have been completed during this reporting period:

- a. Land Application data was sent by Stephanie A. Saldana from Water Quality Assessment, Water Quality Division of TCEQ. See Appendix B.

**33% Complete**

## **TASK 5: Develop Quality Assurance Project Plan**

*Subtask 5.1: TWRI will develop a Quality Assurance Project Plan (QAPP) that will detail project goals and objectives relating to water quality monitoring activities; identify the data needed to fulfill those objectives; list field and laboratory methods; describe procedures and schedules to be followed; and specify a data management structure and the quality assurance protocols.*

The following actions have been completed during this reporting period:

- a. TWRI completed the first draft on April 10, 2007 and sent it to project Investigators to review by April 28, 2007.
- b. Comments were received from project investigators on May 10, May 24, May 31, and June 15, 2007.
- c. TWRI is currently incorporating all comments into the final draft which will be presented to the Arroyo Ag Issues Workgroup on July 24 prior to submission to the TSSWCB for review and approval.

**50% Complete**

*Subtask 5.2: TWRI will provide annual revisions and necessary amendments to the QAPP to the TSSWCB and EPA.*

The following actions have been completed during this reporting period:

- a. Nothing to report at this time.

**0% Complete**

## **TASK 6: Perform Sub-Watershed Monitoring and Measure Pollutant Attenuation in Drainage Ditches**

*Subtask 6.1.1: TAMUK will perform routine monthly grab sampling at four drainage ditch sites.*

The following actions have been completed during this reporting period:

- a. Awaiting approval of QAPP.

**5% Complete**

*Subtask 6.1.2: TAMUK will periodically operate automated samplers and water-level recorders at all four drainage ditch sites to characterize the effects of run-off generated by high storm flow pulses.*

The following actions have been completed during this reporting period:

- a. Awaiting approval of QAPP.

**0% Complete**

*Subtask 6.1.3: Stage-discharge relationships will be developed, maintained and updated, as necessary, for all drainage ditch sites.*

The following actions have been completed during this reporting period:

- a. Awaiting approval of QAPP.

**5% Complete**

*Subtask 6.1.4: TAMUK will conduct routine general maintenance of all automated sampling and water level equipment to help ensure that these instruments will operate properly during storm flow conditions.*

The following actions have been completed during this reporting period:

- a. Awaiting approval of QAPP.

**0% Complete**

*Subtask 6.1.5: TAMUK will develop a report summarizing the monitoring data.*

The following actions have been completed during this reporting period:

- a. Nothing to report at this time.

**0% Complete**

*Subtask 6.2.1: In coordination with the sub-watershed monitoring sites discussed in Task 6.1, TAMUK, with assistance from TAES, will assess nitrogen and phosphorous mitigation processes in drainage ditches.*

The following actions have been completed during this reporting period:

- a. Awaiting approval of QAPP.

**5% Complete**

*Subtask 6.2.2: TAMUK, with assistance from TAES, will develop a suite of suitable BMPs that incorporates the information obtained from the investigation of agricultural drainage ditches described in Subtask 6.2.1 above.*

The following actions have been completed during this reporting period:

- a. Nothing to report at this time.

**0% Complete**

## **TASK 7: Evaluate BMPs to Reduce NPS Pollution at the Farm Level**

*Subtask 7.1: Selection of sites. Texas Cooperative Extension (TCE), Texas Agricultural Experiment Station-Weslaco (TAES-Weslaco), and Texas A&M University-Kingsville (TAMUK) will select suitable demonstration sites to assess loadings from agricultural runoff and leachate produced by different BMPs and compare traditional practices with innovative*

*BMP for the three (3) most representative crops of the watershed. Six (6) representative sites will be characterized and physical characteristics of such as topography, soil texture, salinity and fertility levels, water quality and crops will be obtained and evaluated*

The following actions have been completed during this reporting period:

- a. Six sites have been selected and included in the QAPP.

**100% Complete**

*Subtask 7.2: Installation of sensors. Flow meters, rain gauges, piezometers, soil water sensors will be installed by TAES-Weslaco in the demonstration sites*

The following actions have been completed during this reporting period:

- a. Awaiting approval of QAPP.

**0% Complete**

*Subtask 7.3: Collection and analysis of Data. Runoff and leachate samples will be collected by TAES-Weslaco for the different practices and laboratory analyses will be performed to determine agricultural loadings such as nutrients and solutes. BMPs and traditional practices will be compared economically and their relationship with nutrient loadings will be established*

The following actions have been completed during this reporting period:

- a. Awaiting approval of QAPP.

**0% Complete**

*Subtask 7.4: Field Days and Result Demonstrations. TCE will conduct one field day and one result demonstration per year to demonstrate and transfer the result to farmers and interested persons. Newspaper and communications media will be used to divulge the results*

The following actions have been completed during this reporting period:

- a. Nothing to report at this time.

**0% Complete**

## **TASK 8: Develop Final Report**

*Subtask 8.1: TWRI, with assistance from TAES and TAMUK, will prepare final report for submittal to the TSSWCB.*

The following actions have been completed during this reporting period:

- a. Nothing to report at this time.

**0% Complete**

### **Related Issues/Current Problems and Favorable of Unusual Developments**

- None to report at this time

### **III. Projected Work for Next Quarter**

#### **Task 1**

- The Arroyo Colorado Watershed Partnership Ag Issues Workgroup will meet on July 24 and will provide input on the proposed monitoring
- Year 1, Quarter 3 Report will be submitted.
- TWRI will participate in Arroyo Colorado Partnership and Arroyo Colorado Agricultural Issues Work Group Meetings on July 24.
- The Arroyo Colorado website is expected to be updated and up and running next quarter.

#### **Task 2**

- Work will be initiated to gather and evaluate prior studies and data.

#### **Task 3**

- Data collection efforts will be initiated next quarter.

#### **Task 4**

- Data collection and analysis efforts will continue.

#### **Task 5**

- QAPP will be submitted to the TSSWCB for review and approval.

#### **Task 6**

- Upon approval of the QAPP, sub-watershed monitoring will commence.

#### **Task 7**

- Upon approval of the QAPP, BMP evaluation will commence.

## APPENDIX A

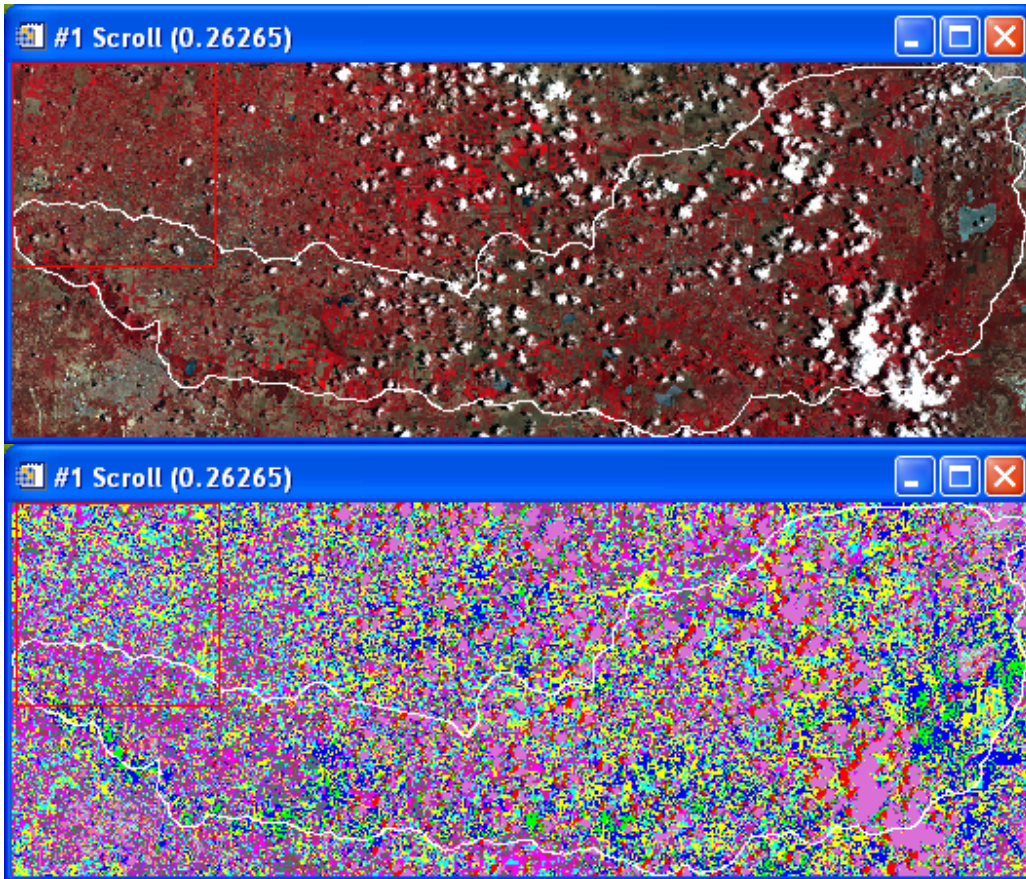
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Bob	Wiedenfeld	<a href="mailto:b-wiedenfeld@tamu.edu">b-wiedenfeld@tamu.edu</a>

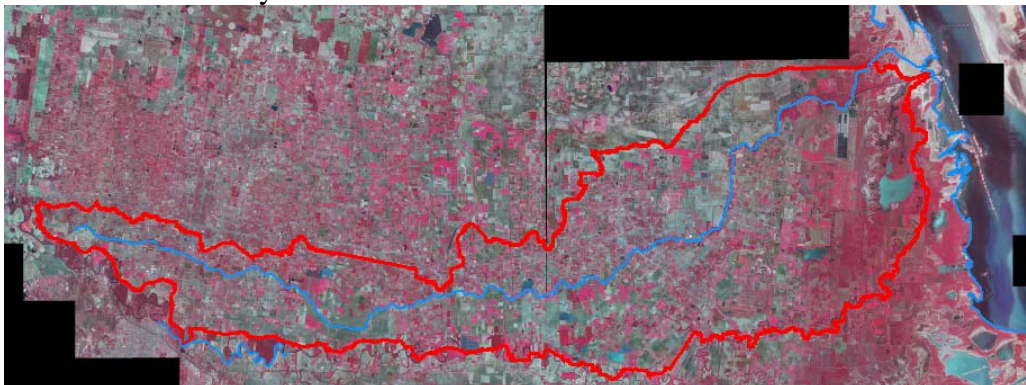
## APPENDIX B

### ARROYO LULC DATA

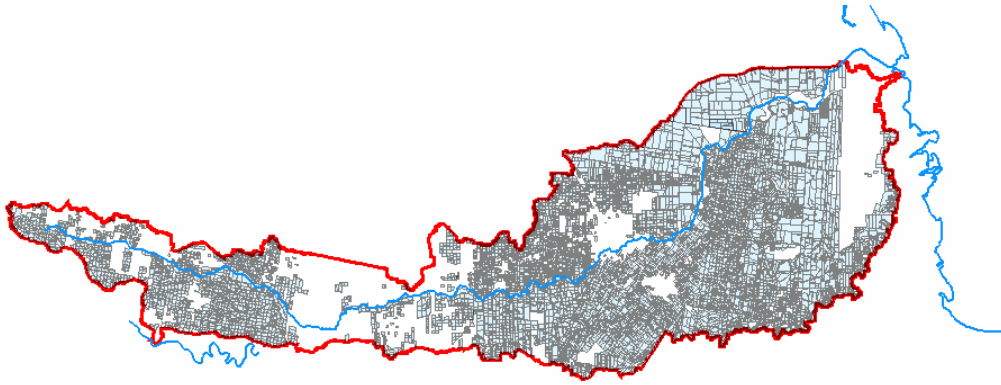
- Landsat data



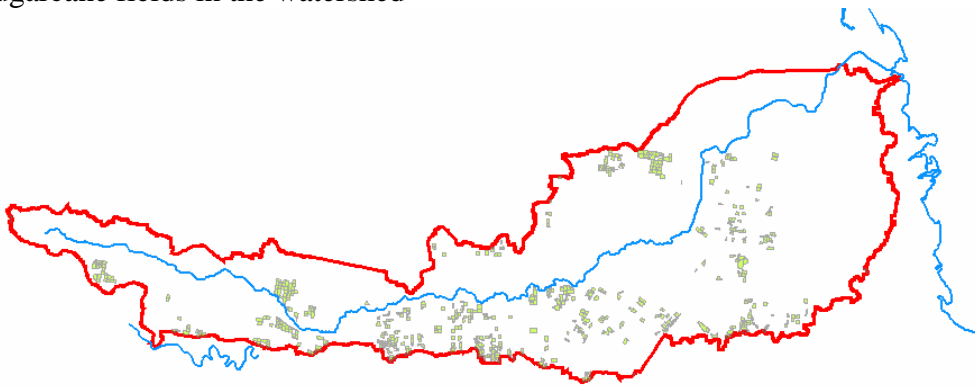
Watershed Boundary



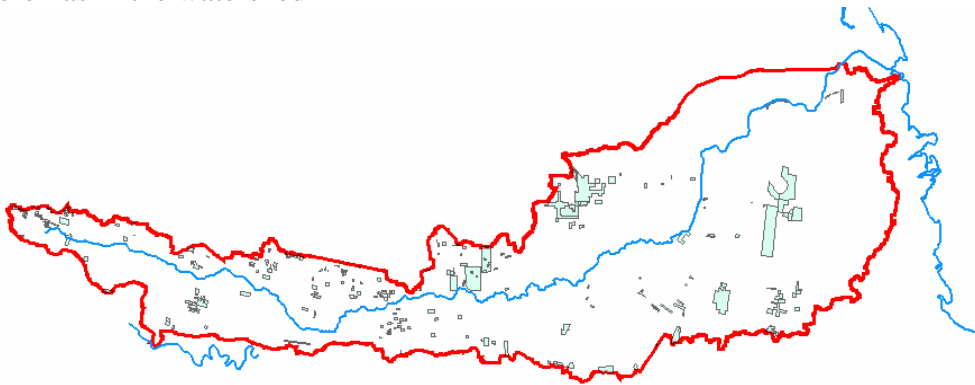
CLUs of the watershed



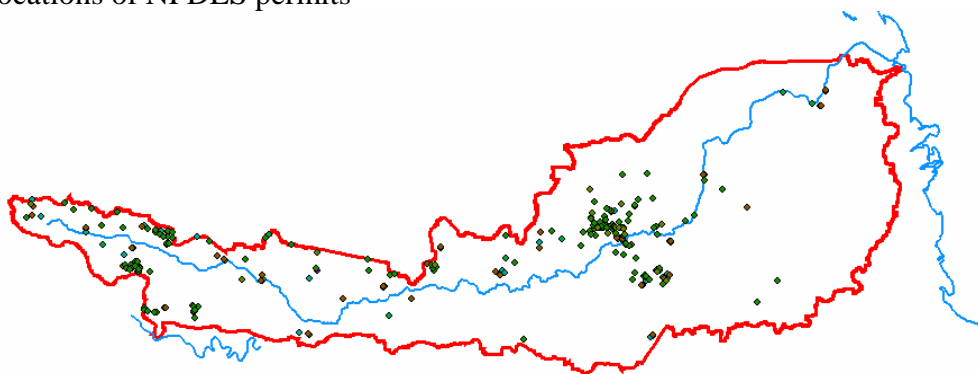
Sugarcane fields in the watershed



Colonias in the watershed



Locations of NPDES permits



Locations of Land Application Data

