

# STATE OF NEBRASKA

## DEPT OF NATURAL RESOURCES

**Remit To:**

DEPT OF NATURAL RESOURCES  
INTERAGENCY BILLING # 290  
P.O. BOX 94676  
LINCOLN NE 68509-4676



## REMITTANCE COPY

Invoice Number: 234469  
Page: 1 of 1  
Invoice Date: 07/31/08  
Account: 558044  
Due Date: 07/31/08

**BILLING ADDRESS:**

GAME & PARKS COMMISSION  
NEBRASKA ENVIRONMENT TRUST  
700 SOUTH 16TH STREET  
PO BOX 94913  
LINCOLN NE 68509-4913

**CUSTOMER ADDRESS:**

GAME & PARKS COMMISSION  
ENVIRONMENTAL TRUST FUND  
700 S 16TH ST  
LINCOLN NE 68508-3703

<u>Item Number</u>	<u>Remark</u>	<u>Amount</u>
001	29202057.461500	43,323.19

Total Amount Invoiced

43,323.19

*PA 7/31/08*

**SUBMIT REMITTANCE COPY WITH PAYMENT AND KEEP ORIGINAL FOR YOUR RECORDS**

15, 15 15421



# The Nebraska Environmental Trust

preserving NATURAL NEBRASKA™ for future generations

## PERIODIC REPORT COVER SHEET AND INSTRUCTIONS

Please use this form to file periodic project reports as required in your Trust grant contract. These reports should consist of the following four parts:

- The Cover Sheet.** Please complete the information below as requested.
- Request for Reimbursement.** You must submit original invoices to document each expense for which you request reimbursement, unless otherwise provided in your grant contract. Each invoice must contain the name, address and social security or federal tax identification number of the vendor, and an itemized list of services or goods with costs and the dates of service or delivery. If invoices contain non-grant items, clearly note the exceptions. On the reverse of this page you will find a table entitled "Summary of Invoices Submitted for Reimbursement." List each invoice on the table, providing the information as requested. Be sure the expenditure description contains sufficient information to determine that the item or activity is a legitimate project expense. The column "Budget Category" references the categories you created in your contract budget outline: each invoice must identify which category name it falls under. Copy the table if you need additional reporting space. Clip the invoices in the order listed on the Summary sheet.
- Project Narrative.** On a separate page(s), describe project activities, partners and results of the project for this period. If modifications were made to the project, describe the changes and explain why they were necessary. Quantify any results you can, for example, acres restored, pounds recycled, etc.
- Report on Matching and In-Kind Expenditures.** Use this form to report all resources expended on the project other than those funded by the Trust. Examples of these costs could include materials, labor, donations, other matching funds or volunteer labor time.

**Project Sponsor:** Nebraska Department of Natural Resources

**Fiscal Agent:** Steve Gaul, Designated Project Representative, Rex Gittins, Fiscal Agent

**Fiscal Agent Address:** Nebraska Department of Natural Resources, 301 Centennial Mall South, PO Box 94676, Lincoln, NE 68509-4676  
(street address, city, state, zip code)

**Project Title:** Riparian Vegetation Impacts on Stream Quantity, Quality and Stream Ecology **Project No.:** 08-141

**Reporting Period:** April 4, 2008 to June 30, 2008 **Tax I.D. #** 47-0491233

**TOTAL AMOUNT REQUESTED FOR THIS PERIOD:** \$43,323.19  ACH or  CHECK

I certify that this report is correct and just; that all expenses were necessary expenses of the project and were incurred in accordance with the approved grant agreement, including any amendments thereto; and that progress of the work and services under grant contract is satisfactory and consistent with the amount billed. As the Sponsor named above, or agent thereof, I hereby claim reimbursement from the STATE OF NEBRASKA for the attached and itemized expenses, for which payment has not previously been made by the STATE OF NEBRASKA.

**FOR THE SPONSOR:** Robert Stephen Gaul **DATE:** 7/30/2008  
Signature

Steve Gaul **TITLE:** Designated Project Representative  
Typed or Printed Name

**REQUEST FOR REIMBURSEMENT**

*April 4, 2008 to June 30, 2008*

*Project 08-141 Riparian Vegetation Impacts on Water Quantity, Quality and Stream Ecology*

We request reimbursement of \$43,323.19 for the period of April 4, 2008 to June 30, 2008. For a breakdown of costs by budget category, please see the accompanying bill submitted to the Department of Natural Resources by the University of Nebraska.



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**FOR THE SPONSOR:** Robert Stephen Jay **DATE:** 7/30/2008  
Signature

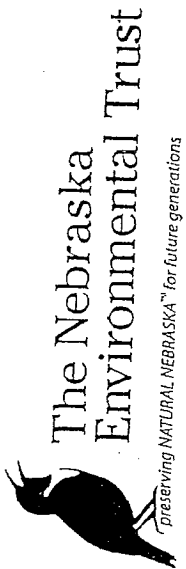
Steve Gaul **TITLE:** Designated Project Representative  
Typed or Printed Name

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*Project 08-141 Riparian Vegetation Impacts on Water Quantity, Quality and Stream Ecology*

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**SUMMARY OF INVOICES SUBMITTED FOR REIMBURSEMENT**

Invoice # or Date	Vendor	Description of Services	Budget Category	Invoice Amount
7/7/08 #2662380391-01	University of Nebraska Office of Sponsored Programs	See Attached Invoice	Attached Invoice Breaks Down by Budget Category	\$43,323.19
<b>TOTAL:</b>				<b>\$43,323.19</b>

Project #: 08-141 Project Sponsor: Nebraska Department of Natural Resources

Report for period from April 4, 2008 to June 30, 2008

Summary of Invoices 04/01/03



# The Nebraska Environmental Trust

preserving NATURAL NEBRASKA™ for future generations

## REPORT ON MATCHING AND IN-KIND EXPENDITURES

Please summarize all resources expended on the project other than those funded by the Trust. Examples of these costs could include materials, labor, donations, other grants, matching funds or volunteer labor time.

ITEM	SOURCE	\$ VALUE
Match for Salaries, Benefits, Indirect Costs	Univesity of Nebraska - See Attached Documentation	\$7,215.52
		\$0.00
		\$0.00
		\$0.00
		\$0.00
		\$0.00
		\$0.00
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		\$0.00
		\$0.00
		\$0.00
		\$0.00
		\$0.00
		\$0.00
		\$0.00
		\$7,215.52

Report for period from 04/04/08 to 06/30/08



The Nebraska Environmental Trust  
Preserving NATURAL NEBRASKA™ for future generations

**SUMMARY OF INVOICES SUBMITTED FOR REIMBURSEMENT**

Invoice # or Date	Vendor	Description of Services	Budget Category	Invoice Amount
7/7/08 #2662380391-01	University of Nebraska Office of Sponsored Programs	See Attached Invoice	Attached Invoice Breaks Down by Budget Category	\$43,323.19
<b>TOTAL:</b>				<b>\$43,323.19</b>

Project #: 08-141

Project Sponsor: Nebraska Department of Natural Resources

Report for period from April 4, 2008

to June 30, 2008

Summary of Invoices 04/01/03





The Nebraska Environmental Trust

preserving NATURAL NEBRASKA™ for future generations

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		\$0.00
		\$0.00
		\$0.00
		\$7,215.52

Report for period from 04/04/08 to 06/30/08

**PROJECT NARRATIVE/PERIODIC REPORT**

**April 4, 2008 to June 30, 2008**

*Project 08-141 Riparian Vegetation Impacts on Water Quantity, Quality and Stream Ecology*

Please see the attached progress report submitted by our contractor.

# Quarterly Report

**Reporting period:** April 4 – June 30, 2008

**Project:** Riparian Vegetation Impacts on Water Quantity, Quality, and Stream Ecology

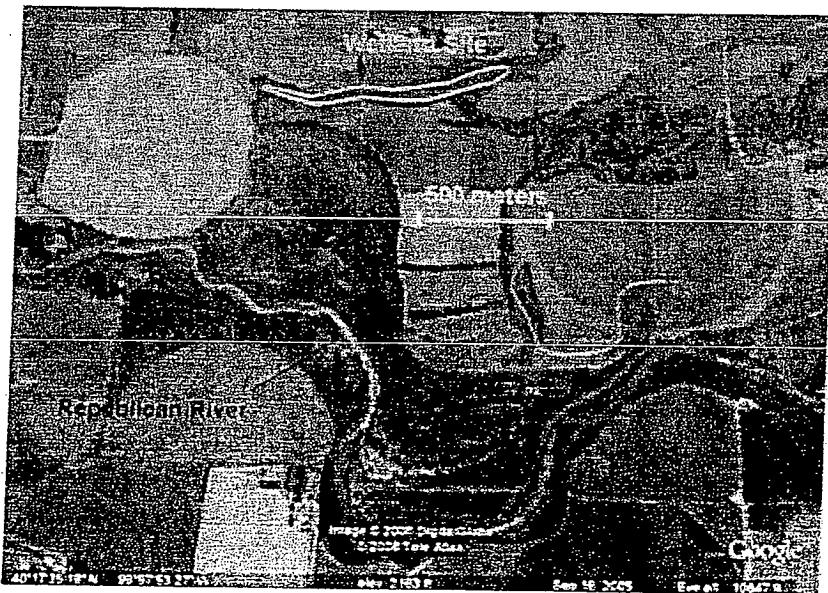
**Principal Investigators:** Durelle Scott, Erkan Istanbuluoglu, John Lenters

## Site Selection

Site selection for this project began in the fall of 2007. In order to estimate evapotranspiration and the impacts on water quality on a field scale we needed to identify a large aquatic site with a dense infestation of invasive species. The mainstem of the Republican River had already undergone vast herbicide treatments and all tributaries feeding into the mainstem did not have sufficiently dense populations of Common Reed (*Phragmites australis*), Russian Olive (*Elaeagnus angustifolia*), or Saltcedar (*Tamarix sp.*). In March of 2008, with the help of Todd Waverka (Furnas County Weed Superintendent), we located a flow-through wetland infested with *P. australis* on private land. We received permission from the land owner to install our equipment and to conduct invasive species removal when it is deemed necessary for the project.

## Site Description

The wetland is located approximately 10 miles east of Cambridge, NE and roughly 600 meters north of the Republican River (Figure 1). The site is classified as a riverine wetland and is most likely a remnant channel of the Republican River. It is roughly 1,000 meters in length and is fed by a groundwater spring in the far western edge. The width of the wetland varies from about 5 meters on the western end to roughly 30 meters on the eastern end. Water flows from west to east until it downwells into the soil on the eastern edge of the wetland.



**Figure 1.** Aerial image of the wetland site located approximately 10 miles east of Cambridge, NE.

The surface area coverage of the wetland can be estimated as: *P. australis* – 50%, Cattail (*Typha latifolia*) – 25%, Common rush (*Juncus effusus*) – 15%, and open water – 10%. Because *P. australis* does not cover the entire wetland and there is flowing water within the wetland, this site provides a controlled situation that mimics that of the Republican River. We have identified cells within the wetland where we can measure evapotranspiration rates in an area infested by *P. australis* and a “control” area in which native species are present. After adequate baseline data is gathered we will then remove *P. australis* and continue to monitor evapotranspiration rates. Likewise we have identified cells with *P. australis* and cells with native species. In these cells we can monitor how water quality is affected by the different plant species. After baseline data has been gathered we will remove the *P. australis* from one cell and continue monitoring water quality data. Using this approach on this particular wetland will allow us to make robust observations and more accurately determine how invasive species and their removal affect water use and water quality.

### **IBIS Modeling**

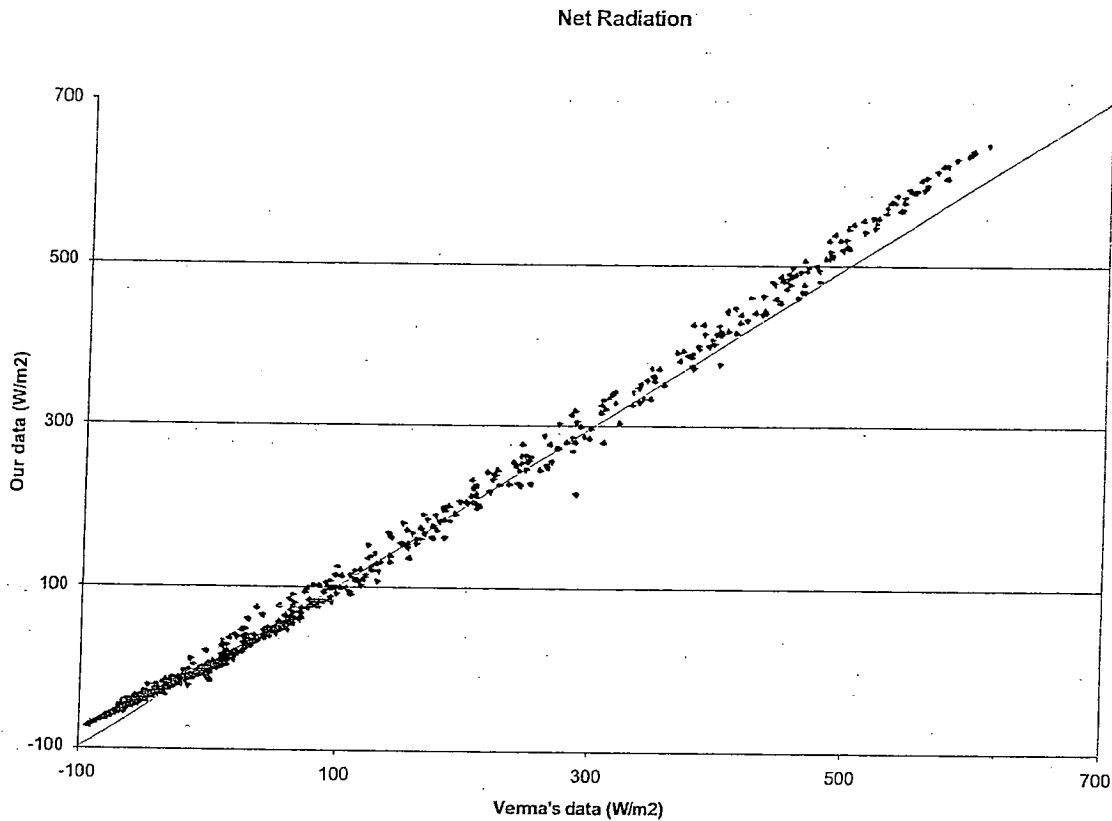
The modeling component of our project utilizes a terrestrial biosphere model known as the Integrated BIosphere Simulator, or IBIS. The model was developed at the University of Wisconsin-Madison over a decade ago and has been used in numerous studies of climate, land surface hydrology, and land use/land cover change. We are currently working with Dr. Christopher Kucharik at UW-Madison, who has been one of the lead developers of IBIS since 1998 and is providing consulting on the riparian vegetation project. Dr. Kucharik made a 3-day visit to UNL from February 11-14, 2008 to visit with our group and initiate the modeling phase of the project. During this time, we installed IBIS on one of our computer workstations and got it successfully compiled and running. Since that time we have been heavily involved in the field component of the project in order to have data with which to evaluate the IBIS model. We have also recruited two graduate students and a postdoc who will be starting in the fall of 2008. They will each be taking a role in the modeling component of the project, and Dr. Kucharik will be providing training during a visit to UNL in September, 2008.

### **Evaluation of Bowen Ratio / Scintillometer Instrumentation**

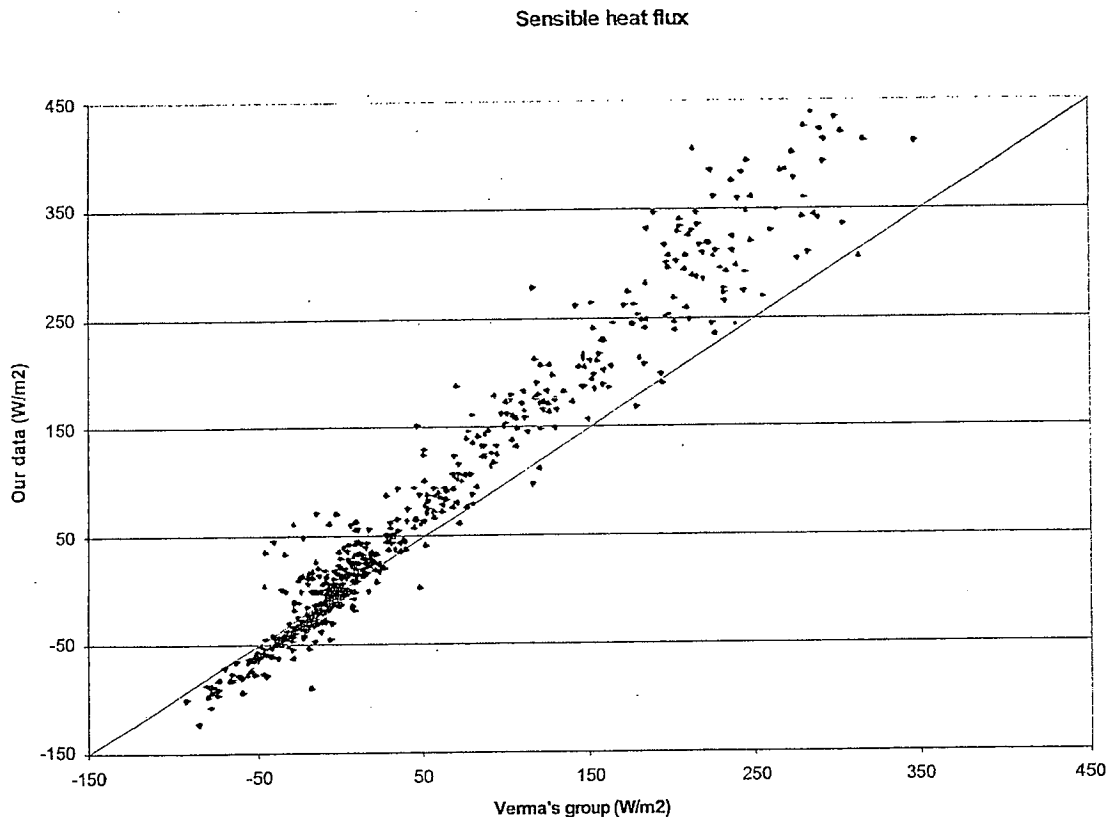
During the period March 20 – April 27, 2008, the Bowen ratio and scintillometer instrumentation were deployed at the UNL field site in Mead, NE. The purpose of this deployment was to compare our own data with existing measurements being collected by Dr. Shashi Verma (and collaborators) to ensure that all the instrumentation was operating properly. This comparison included hourly and daily averages of basic meteorological measurements (air temperature, humidity, barometric pressure, wind speed and direction, and precipitation) as well as more specialized measurements (net shortwave and longwave radiation, sensible heat flux, and soil heat flux).

It was determined that all of the basic meteorological measurements were nearly identical to those being collected by Dr. Verma’s instrumentation. No differences in the data were determined to be significant enough to be cause for concern. As far as the more specialized measurements, which are generally more difficult to measure accurately, we found the comparison to be very good. In particular, measurements of net radiation and sensible heat flux (which are most critical for calculating evapotranspiration rates) were in very close agreement. As an example, Figures 2 and 3 show scatterplots of hourly data for the 38-day period for both of these variables, along with the 1:1 line. The net radiation values fall very close to the 1:1 line (Figure 2), aside from some of the larger values of net radiation, for which our own data show values that are higher than the comparison data. This was found to be due to differences in net longwave radiation, which likely reflect differences in land surface temperature (the two sites are situated in nearby, but not identical locations). The sensible heat

flux values (Figure 3) also show a reasonably good comparison, particularly since the measurements are made using two different techniques. The data from Dr. Verma's group are based on the eddy covariance method, while our own measurements use the scintillometers. Each method measures sensible heat flux over a fairly wide "footprint," but the footprints for the two techniques can often be quite different (depending on weather conditions). The slightly higher values of sensible heat flux in our own measurements are consistent with the higher net radiation values seen in Figure 2.



**Figure 2.** Comparison of hourly net radiation data between our measurements and those of Dr. Verma's group.



**Figure 3.** Comparison of hourly sensible heat flux values from our scintillometer measurements and the eddy covariance data of Dr. Verma's group.

### Installation of Bowen Ratio / Scintillometer Stations at Field Site

In early May of 2008, the Bowen station and scintillometers were removed from the Mead, NE location and installed at the wetland site in the Republican River basin. During preliminary testing (May 7 – May 23), the instruments were installed on their original 8-foot tripods. In the wetland, however, the equipment needs to be located in *P. australis* dominated zones. Because this invasive species can easily grow higher than 10 feet, and adequate relief for placement of the scintillometers was limited, we had to order two 20-foot towers and re-install the instruments at a greater height. This was undertaken in late May and early June. The installation required 4 people, several guy wires, anchoring posts, and many hours of labor to install both 20-foot towers. Once the towers were secured, they were climbed with a harness, and the sensors were properly leveled and installed (Figure 4). Solar panels for the two towers were installed on the bank and wires were run from the panels to the datalogger. One of the scintillometer units was installed on the southern bank of the wetland and required several tree branches and vegetation to be cleared for a clear line of sight to the other unit (which was installed on one of the 20-foot towers in the wetland). The line of sight between the two units is approximately 225 meters and is almost entirely composed of *P. australis* (Figure 5). The Bowen tower is located between the two scintillometers, but slightly off center to ensure that it does not disrupt the scintillometry signal. Examples of some of the preliminary meteorological data collected during the early and mid summer periods are shown in Figure 6.

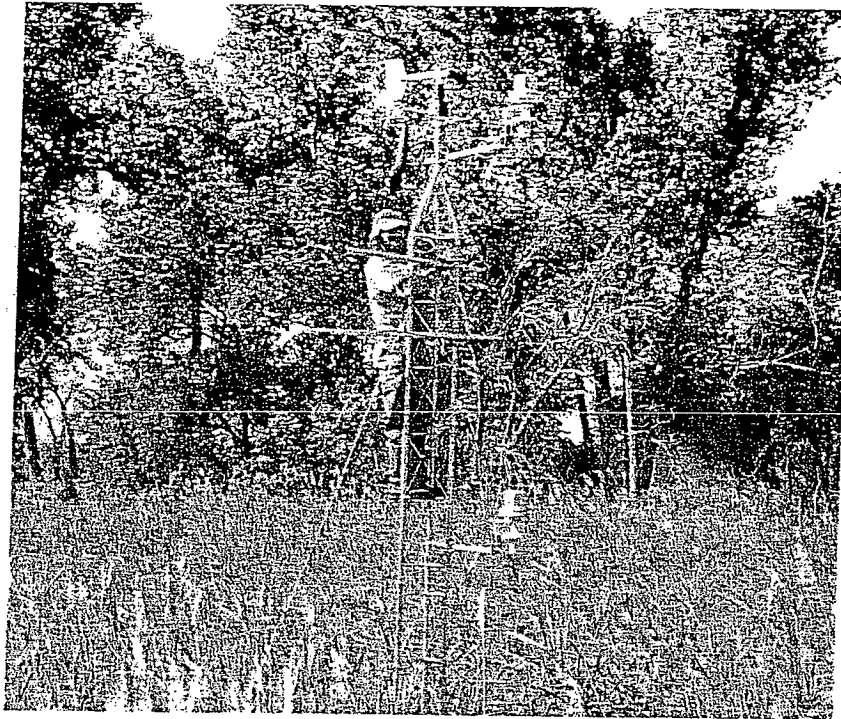


Figure 4. Installation of sensors for the Bowen ratio station on a 20-foot radio tower in *P. australis*.

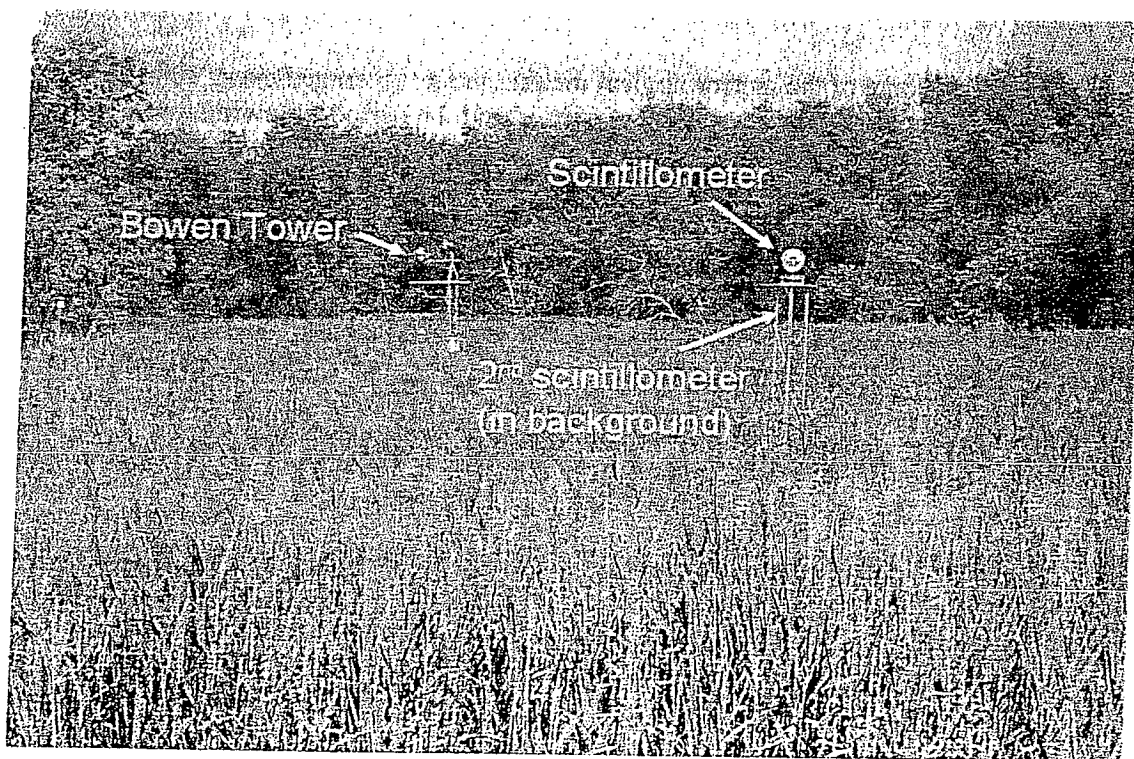
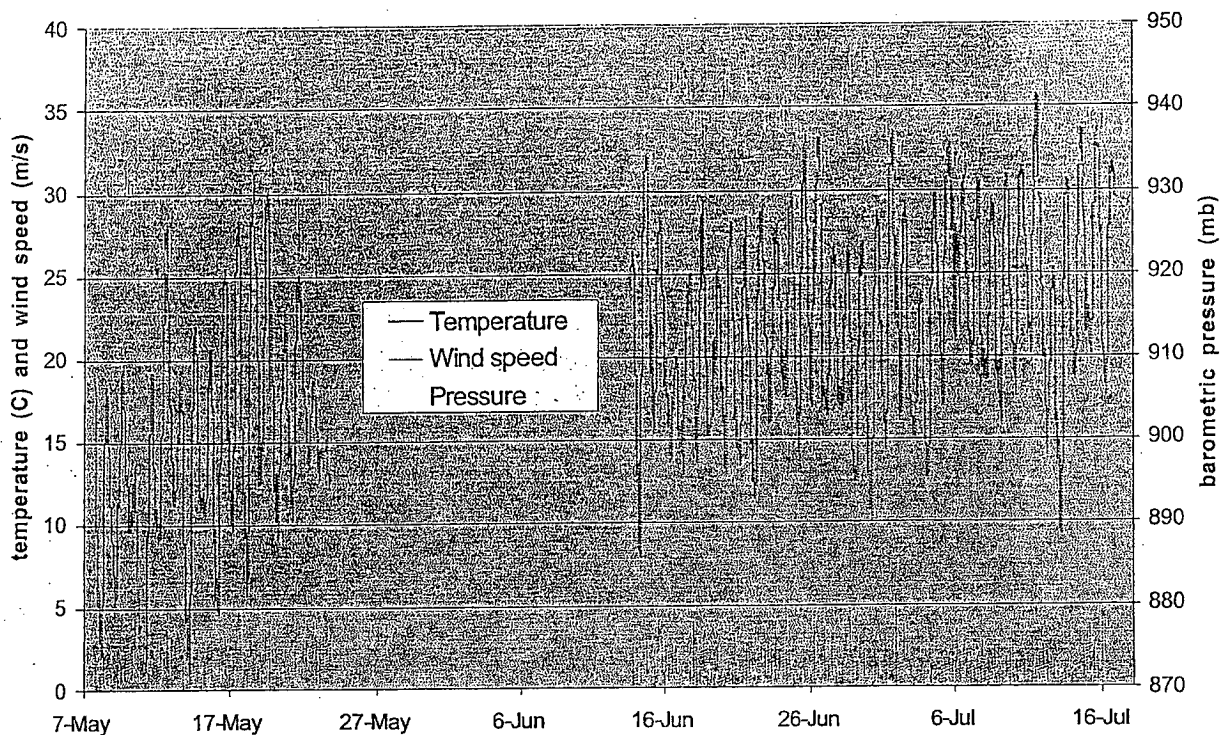


Figure 5. The Bowen tower and two scintillometers installed in the wetland. The 2<sup>nd</sup> scintillometer is located on the bank in the background of the picture and is difficult to see from 225 meters away.

## Meteorological measurements



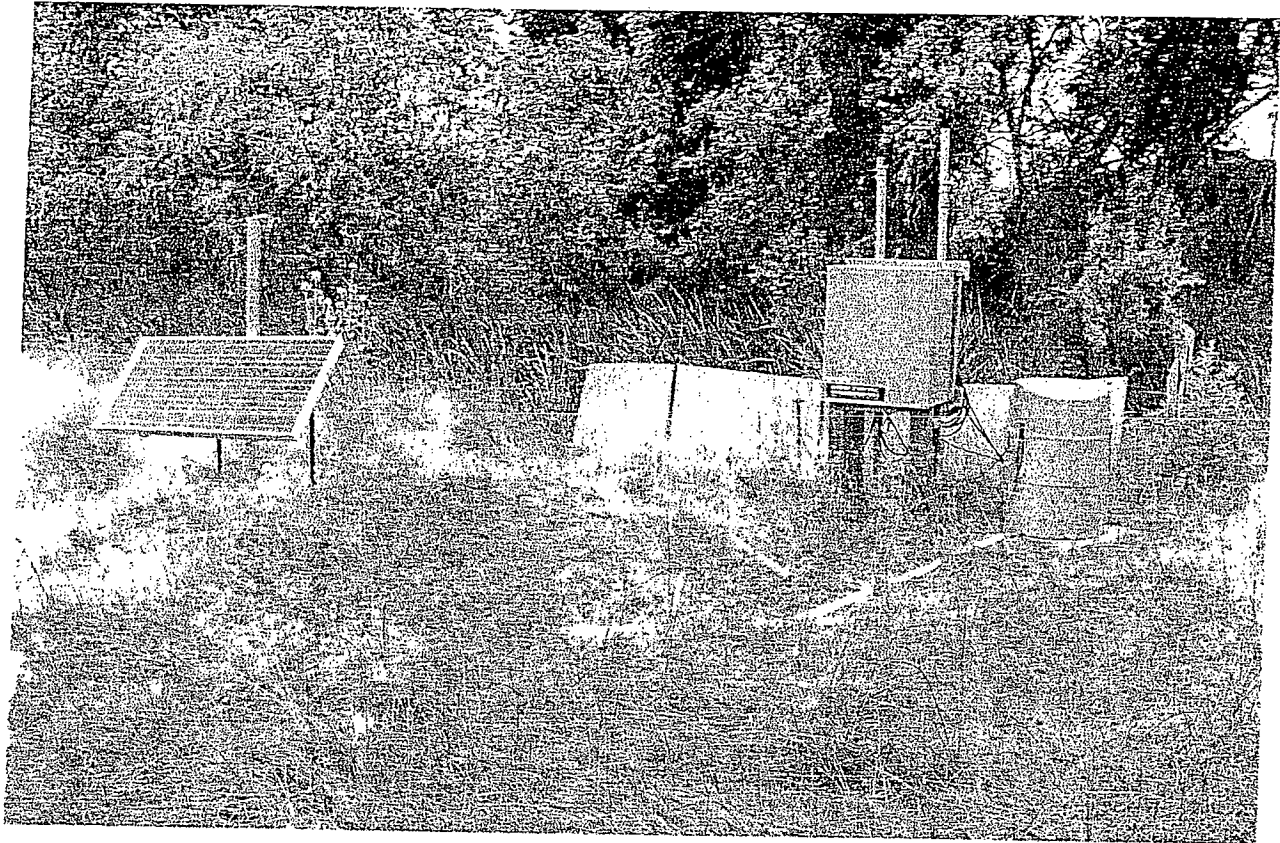
**Figure 6.** Examples of some of the meteorological measurements (averaged every 10 minutes) at the wetland site during the preliminary data collection period and the period following tower installation. (The data gap in late May and early June represents the period in which the 20-foot towers were being installed and the instruments had not yet been transferred to their new location.) All three atmospheric measurements show variations which are typical of the synoptic weather variability in central Nebraska.

### Installation of Water Quality Equipment

The water quality equipment consists of three individual stations located roughly 25 meters apart. Site 1 is the first station and is located farthest upstream, while site 2 is downstream, followed by site 3. At each station we have installed the following equipment (Figure 7):

- Nexsens datalogger (ISIC 3100) or Campbell datalogger (CR1000) equipped with either a Raven cellular modem (sites 1 and 3) or an RF modem (site 2) for data collection
- Level Logger – used to measure the water depth of the wetland and determine discharge
- YSI multiparameter sonde – used to measure water temperature, specific conductivity, pH, oxidation reduction potential, dissolved oxygen, and chlorophyll-a concentration
- ISCO – instrument that will automatically take a grab sample of the water column at specific times and dates





**Figure 7.** Picture showing the water quality field equipment installed at site 1 (in the foreground), as well as the wetland (shown in the background). Description of equipment from left to right: Solar panel, Nexsens datalogger equipped with cell modem, and ISCO sampler.

Because the water flow is diffuse in the wetland, fiberglass reinforced plastic (FRP) panels were installed to channelize the flow into the middle of the wetland (Figure 7). This allows us to concentrate the flow into a width of 1 meter or less. Probes and sensors are then positioned to sample within this pinch point.

To date we have preliminary data from 2 sites (site 1 and 3), beginning in middle of June 2008. These two sites are providing “real time” data via the cellular modems attached to the dataloggers. Thus, we can use the Nexsens website ([www.wqdata.com](http://www.wqdata.com); username: wrapuni; password: bessey) to examine the wetland data from any location with internet access. This is a powerful tool that allows us to monitor up-to-date conditions in the wetland and gain insight into any maintenance or sensor malfunctions that may occur. Our initial observations showed expected diurnal fluctuations in water temperature, as well as water level fluctuations after rain events. In Figure 8 (from site 1), a rain event occurred on June 19, 2008 causing the level to increase, while water temperature fluctuated with air temperature. Site 2 will be operational within a month, and data from all three sites will be compared and monitored throughout the course of the project. ISCO’s will be used to grab samples simultaneously from each site. Samples will be brought back to the laboratory in Lincoln and processed for concentrations of nitrate, ammonia, and ortho-phosphate. Ultimately, nutrient removal/production will be assessed within the various cells of the wetland.

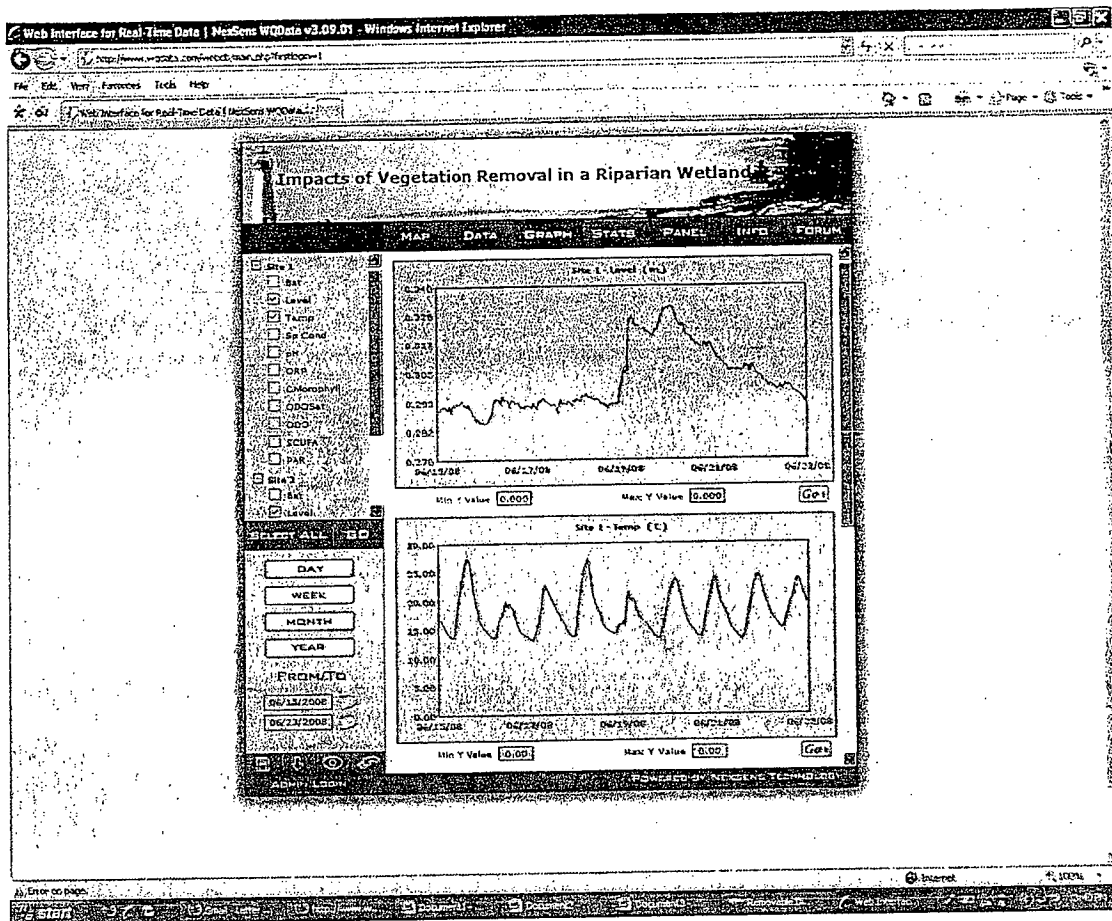
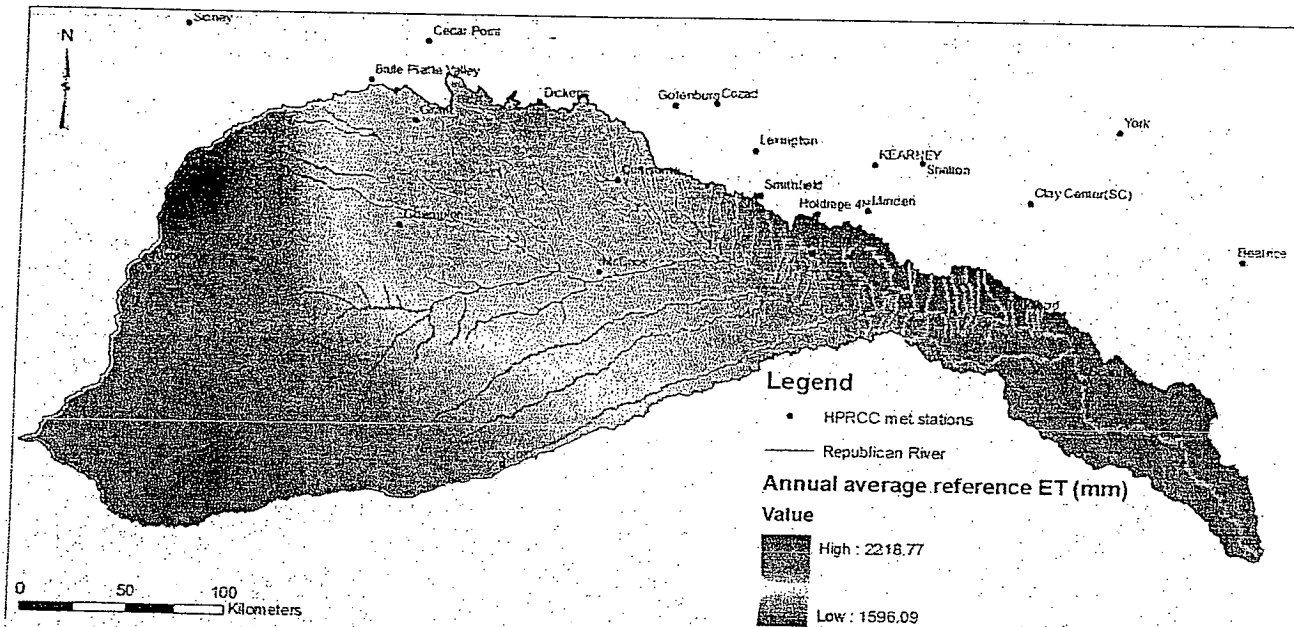


Figure 8. Real time data obtained from the Nexsens website. On June 19, 2008 the water level increased due to a rain event and the water temperature fluctuated diurnally with the changing air temperature.

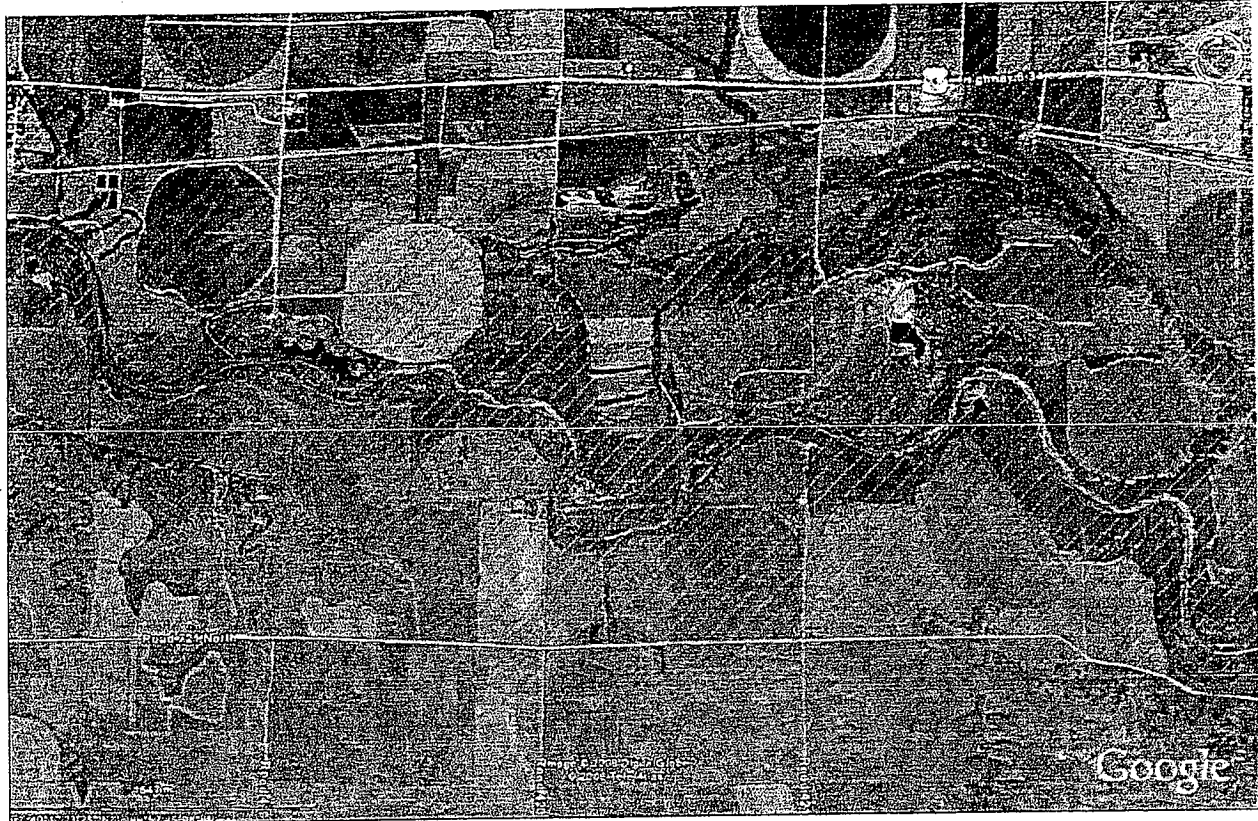
### First-order Estimate of Riparian Evapotranspiration

In this first reporting period we calculated a first-order approximation of mean annual grass evapotranspiration (ET) for the riparian zone, which was delineated using the 2001 National Land Cover Data (NLCD) in the Republican river basin. The purpose of this exercise was to see how much water, at a **maximum**, would be saved, if all the riparian vegetation were removed and no evaporation were allowed from the riparian zone after vegetation removal. Here, instead of actual riparian vegetation ET, we calculate reference grass ET. The reason for this is that we do not yet know the crop coefficients for the riparian plants that would allow us to obtain more accurate riparian ET estimates (which we expect to gain from our field measurements). As the idea is to present a maximum upper limit for ET, we make the assumption that vegetation does not go dormant, but instead continues to evapotranspire at a reduced rate in winter. At select High Plains Regional Climate Center (HPRCC) stations, we used available weather records to calculate daily grass reference ET. From daily values, a mean annual ET value was estimated at each station. These points were then interpolated using the Kriging method in ArcGIS to develop the basin wide ET map shown in Figure 9. A significant west-to-east mean annual ET gradient can be seen in the map, which is the opposite trend of the east-to-west mean annual precipitation gradient for Nebraska (i.e., higher precipitation, lower potential ET).



**Figure 9.** Mean annual reference ET interpolated over the Republican river basin using HPRCC stations.

After obtaining the first-order estimate of ET, we defined a buffer zone by extracting areas within 1 km of the Republican River channel network. Then we extracted the landscapes within the buffer that have the following land use types: Woody wetlands, evergreen forest, mixed forest, emergent herbaceous, and deciduous forest. This area, which we are assuming to represent our “riparian zone” corresponds to approximately 0.77 % of the Republican river basin area. As an illustrative example, the location of our experimental field site and the woody wetlands delineated from the NLCD data are shown in Figure 10.



**Figure 10.** Land use types and riparian buffer zone delineated in the vicinity of our wetland field site.

The end result of this first-order estimate of potential water savings is that the total **maximum** volume of water that is annually transpired from the extracted riparian zone is estimated to be 864,000,000 m<sup>3</sup>. When divided by the basin area (64486 km<sup>2</sup>), this gives a basin-average water depth of 13 mm. When the dormant season and potential water limitations are included, it is plausible that this number will go below 10 mm. If this 10 mm of water in the entire basin were collected and released into the Republican River at a constant rate, it would contribute 744 cubic feet per second (cfs) of year-round discharge. This assumes, of course, that the saved water does not recharge back into the aquifer below the channel, that the riparian corridor is kept clean of vegetation, and that any water loss (including soil evaporation) is not allowed. Clearly these are not very accurate assumptions, but they allow us to make a first-order estimate of the potential maximum water savings. As we continue to obtain field data, refine our assumptions, and incorporate more sophisticated modeling, we will be able to arrive at a more reasonable estimate of the **actual** water savings (if any), rather than just the maximum. In all likelihood, the final number will be significantly less than the maximum value of 744 cfs.



# UNL INTERAGENCY BILLING INVOICE

**REMIT TO:**

UNIVERSITY OF NEBRASKA-LINCOLN  
 INTERAGENCY BILLING # 512  
 P.O. BOX 880439  
 LINCOLN, NE 68588-0439

Invoice Number **90053224**

Page: 1 of 1

Invoice Date: 7/7/08

Due Upon Receipt

**BILLING ADDRESS:**

NEBRASKA DEPARTMENT OF NATURAL RESOURCES  
 301 CENTENNIAL MALL SOUTH  
 PO BOX 94676  
 LINCOLN, NE 68509-4676

**CUSTOMER/SHIP TO ADDRESS:**

NEBRASKA DEPARTMENT OF NATURAL RESOURCES  
 301 CENTENNIAL MALL SOUTH  
 PO BOX 94676  
 LINCOLN, NE 68509-4676

Item Number	Description of Charges	Amount
001	Requesting 1st payment for project entitled "Riparian Vegetation Impacts on Water Quantity, Quality and Stream Ecology, Durelle Scott and John Lenters, P.I.s Period: 4/4/08 to 6/30/08	43,323.19

**RECEIVED**  
 JUL 7 2008  
**UNL ACCOUNTING**

Balance Due 43,323.19

<b>Departmental Information:</b>	
Campus Billing Dept.	SPONSORED PROGRAMS
Contact Name:	BELINDA GILLAM
Phone:	472-7061

*Belinda Gillam 20882038*

<b>SAP Coding:</b>		
SAP Cost Object	G/L Account	Amount
26-6238-0391-001	462102	43,323.19
Total		43,323.19



TO:  
 Nebraska Department of Natural Resources  
 301 Centennial Mall South  
 PO Box 94676  
 Lincoln, NE 68509-4676

OFFICE OF SPONSORED PROGRAMS  
 Post-Award Administration  
 303 Canfield Administration Building  
 Lincoln, NE 68588-0431  
 FED ID # 47-0049123

AGREEMENT TITLE/CONTRACT NUMBER:  
 Riparian Vegetation Impacts on Water  
 Quantity, Quality and Stream Ecology

INVOICE/REPORT: 2662380391-01

INVOICE PERIOD: 4/4/08 to 6/30/08

Directed by Durelle Scott and John Lenters

REFERENCE NUMBER: 26-6238-0391-001

**ANALYSIS OF CLAIMED CURRENT AND CUMULATIVE COSTS**

MAJOR COST ELEMENTS	MATCH AMOUNT FOR CURRENT PERIOD	AMOUNT FOR CURRENT PERIOD	CUM. AMOUNT FROM INCEPTION TO DATE
Personnel and Benefits	\$0.00	\$12,045.39	\$12,045.39
Equipment	\$0.00	\$27,252.98	\$27,252.98
Travel-Domestic	\$0.00	\$0.00	\$0.00
Other Direct Costs	\$0.00	\$4,024.82	\$4,024.82
Indirect Costs	\$7,215.52	\$0.00	\$0.00
<b>Total Amount</b>	<b>\$7,215.52</b>	<b>\$43,323.19</b>	<b>\$43,323.19</b>

Payment Requested

\$43,323.19

NOTE: Payment due in 30 days - August 6, 2008

PLEASE REMIT A COPY OF THE INVOICE ALONG WITH THE PAYMENT.

"I certify that all expenditures reported (or payment requested) are for appropriate purposes and in accordance with the agreements noted above."

Belinda Gillam - Project Specialist

(402) 472-7061

[bgillam1@unl.edu](mailto:bgillam1@unl.edu)

Date:

July 7, 2008

UNFORM2 07-04

Effective Date	Account #	Document Description	Item Description	Account	Amount
20080521			CMP3 PYRANOMETER-FIELDWK IN REPUBLICAN RVR BASIN	Equipment	878.00
20080530		Account # correction	University Salary Payroll 05/30/08	Personnel and Benefits	3,118.16
20080530			University Salary Payroll 05/30/08	Personnel and Benefits	2,600.00
20080530			University Salary Payroll 05/30/08	Personnel and Benefits	249.45
20080530			University Salary Payroll 05/30/08	Personnel and Benefits	230.38
20080530			University Salary Payroll 05/30/08	Personnel and Benefits	346.46
20080609		CAMPBELL SCI INC	TCAV-L50 - 8731-4 - AVERAGING SOIL TC	Equipment	0.94
20080609		CAMPBELL SCI INC	FREIGHT TO LINCOLN,TOWER WILL NOT SHIP	Equipment	204.86
20080609		CAMPBELL SCI INC	IRR-P - 19119 - APOGEE INFRARED	Equipment	274.00
20080609		CAMPBELL SCI INC	CM230 - 17908 - ADJUSTABLE ANGLE	Equipment	679.78
20080609		CAMPBELL SCI INC	CM204 - 17904 - SENSOR CROSSARM W/ONE	Equipment	36.32
20080609		CAMPBELL SCI INC	UT10 - 7829 - 10FT TOWER W/BASE	Equipment	77.29
20080609		CAMPBELL SCI INC	CS100 - 8738 - SETRA 278 BAROMETER	Equipment	512.16
20080609		CAMPBELL SCI INC	TCAV-L50 - 8731-4 - TEXAS ELECTRONICS	Equipment	549.41
20080609		CAMPBELL SCI INC	SP65 - 18530 - 65W SOLAR PANEL,15FT CABLE	Equipment	367.63
20080609		CAMPBELL SCI INC	18529 - MORNING STAR SUNSAVER - 10 10A	Equipment	1,583.04
20080609		CAMPBELL SCI INC	4386 - BATTERY TERMINAL BUS STUFFED	Equipment	121.06
20080609		CAMPBELL SCI INC	CR3000-ST-SW-NB-NC-17852-47-MICROLOGGER	Equipment	38.80
20080609		CAMPBELL SCI INC	CFM100-ST-SW - 17345-13 - COMPACT FLASH	Equipment	2,724.69
20080616		MOOSES TOOTH	ENC16/18-SC-TM - 15873-44 - WEATHER	Equipment	325.92
20080616		TRACTOR SUPPLY #766	HARNES AND QUICKWIRE QUICK DRAW	Equipment	325.92
20080616		LOWES #02739*	TAPE, CLAMPS, AND SNAPS	Other Direct Costs	65.00
20080616		MENARDS 3179 LINCOLN SOUT	EMT CONDUIT AND POST LINE	Other Direct Costs	215.54
20080623			DRILL BIT, FIRST AID KIT, AND TOTES	Other Direct Costs	62.94
20080623			1.6MHZ N200 C2D/1G/120G/DVDRW/15.4"XPP	Other Direct Costs	168.81
20080624		THE HOME DEPOT #3209	MACBOOK PRO/15"/2.4GHZ/2GB/160GB/SD	Other Direct Costs	599.00
20080624		THE HOME DEPOT #3209	nuts, bolts, wire rope, plastic bags	Other Direct Costs	1,699.00
20080624		LOWES #02739*	cinder blocks	Other Direct Costs	172.16
20080626		CASES4LESS COM	ladder, pvc divider	Other Direct Costs	9.97
20080626		OTHER WORLD COMPUTING	CASE AND LID ORGANIZER FOR LAPTOP	Other Direct Costs	320.16
20080627		MS CAMPUS AGREEMENT FEE	MEMORY FOR LAPTOP	Other Direct Costs	126.27
20080627		MS CAMPUS AGREEMENT FEE	CUSTOM MAC PRO/320GB/2GB/WBKWMM	Other Direct Costs	460.97
20080627		OTHER WORLD COMPUTING	4300218101	Equipment	2,649.00
20080627		YSI INC	4300218101	Equipment	125.00
20080627		YSI INC	MEMORY AND HRD DRIVE FOR MAC	Other Direct Costs	125.00
20080627		KIPP & ZONEN USA	Part # 006565	Equipment	460.97
20080627		YSI INC	Part # 006096	Equipment	325.79
20080627		R.M. YOUNG COMPANY	CNR2 NET RADIOMETER - FIELDWK-REPUBLICAN RVR BASIN	Equipment	80.20
20080630			Part # 606025	Equipment	2,935.00
			INV #95303 ASPIRATED TEMPI/RH SENSOR,ANEMOMETER,	Equipment	8,059.55
			University Salary Payroll 06/30/08	Equipment	3,918.59
				Personnel and Benefits	5,500.00
					43,323.19

Riparian Vegetation Impacts on Water Quantity, Quality and Stream Ecology

Detail

26-6238-0391-001

cost object	account	item description	amount	effective date	document description
2662380391001	533910	CMP3 PYRANOMETER-FIELDWK IN REPUBLICAN RVR BASIN	878.00	20080521	Account # correction
2662380391001	511100	University Salary Payroll 05/30/08	3,118.16	20080530	
2662380391001	515210	University Salary Payroll 05/30/08	2,600.00	20080530	
2662380391001	519100	University Salary Payroll 05/30/08	249.45	20080530	
2662380391001	519200	University Salary Payroll 05/30/08	230.38	20080530	
2662380391001	519300	University Salary Payroll 05/30/08	346.46	20080530	
2662380391001	519400	University Salary Payroll 05/30/08	0.94	20080530	
2662380391001	553820	TCAV-L50 - 8731-4 - AVERAGING SOIL TC	204.86	20080609	CAMPBELL SCI INC
2662380391001	553820	FREIGHT TO LINCOLN, TOWER WILL NOT SHIP	274.00	20080609	CAMPBELL SCI INC
2662380391001	553820	IRR-P - 19119 - APOGEE INFRARED	679.78	20080609	CAMPBELL SCI INC
2662380391001	553820	CM230 - 17908 - ADJUSTABLE ANGLE	36.32	20080609	CAMPBELL SCI INC
2662380391001	553820	CM204 - 17904 - SENSOR CROSSARM W/ONE	77.29	20080609	CAMPBELL SCI INC
2662380391001	553820	UT10 - 7829 - 10FT TOWER W/BASE	512.16	20080609	CAMPBELL SCI INC
2662380391001	553820	CS100 - 8738 - SETRA 278 BAROMETER	549.41	20080609	CAMPBELL SCI INC
2662380391001	553820	TCAV-L50 - 8731-4 - TEXAS ELECTRONICS	367.63	20080609	CAMPBELL SCI INC
2662380391001	553820	SP65 -18530 - 65W SOLAR PANEL, 15FT CABLE	1,563.04	20080609	CAMPBELL SCI INC
2662380391001	553820	18529 - MORNING STAR SUNSAVER - 10 10A	121.06	20080609	CAMPBELL SCI INC
2662380391001	553820	4386 - BATTERY TERMINAL BUS STUFFED	38.80	20080609	CAMPBELL SCI INC
2662380391001	553820	CR3000-ST-SW-NB-NC-17852-47-MICROLOGGER	2,724.69	20080609	CAMPBELL SCI INC
2662380391001	553820	CFM100-ST-SW - 17345-13 - COMPACT FLASH	325.92	20080609	CAMPBELL SCI INC
2662380391001	553820	ENC16/18-SC-TM - 15873-44 - WEATHER	325.92	20080609	CAMPBELL SCI INC
2662380391001	533100	HARNESS AND QUICKWIRE QUICK DRAW	65.00	20080616	MOOSES TOOTH
2662380391001	533100	TAPE, CLAMPS, AND SNAPS	215.54	20080616	TRACTOR SUPPLY #766
2662380391001	533100	EMT CONDUIT AND POST LINE	62.94	20080616	LOWES #02739*
2662380391001	533100	DRILL BIT, FIRST AID KIT, AND TOTES	168.81	20080616	MENARDS 3179 LINCOLN SOUT
2662380391001	531955	1.6MHZ N200 C2D/1G/120G/DVDRW/15.4"XPP	599.00	20080623	
2662380391001	531955	MACBOOK PRO/15"/2.4GHZ/2GB/160GB/SD	1,699.00	20080623	
2662380391001	533100	nuts, bolts, wire rope, plastic bags	172.16	20080624	THE HOME DEPOT #3209
2662380391001	533100	cinder blocks	9.97	20080624	THE HOME DEPOT #3209
2662380391001	533100	ladder, pvc divider	320.16	20080624	LOWES #02739*
2662380391001	531951	CASE AND LID ORGANIZER FOR LAPTOP	126.27	20080626	CASES4LESS COM
2662380391001	531952	MEMORY FOR LAPTOP	460.97	20080626	OTHER WORLD COMPUTING
2662380391001	531955	CUSTOM MAC PRO/320GB/2GB/WBK/WMM	2,649.00	20080626	
2662380391001	523401	4300218101	250.00	20080627	MS CAMPUS AGREEMENT FEE
2662380391001	531952	MEMORY AND HRD DRIVE FOR MAC	460.97	20080627	OTHER WORLD COMPUTING
2662380391001	533910	Part # 006565	325.79	20080627	YSI INC
2662380391001	533910	Part # 006096	80.20	20080627	YSI INC
2662380391001	533910	CNR2 NET RADIOMETER - FIELDWK-REPUBLICAN RVR BASIN	2,935.00	20080627	KIPP & ZONEN USA
2662380391001	533910	Part # 606025	8,059.55	20080627	YSI INC
2662380391001	533910	INV #95303 ASPIRATED TEMP/RH SENSOR, ANEMOMETER,	3,918.59	20080627	R.M. YOUNG COMPANY
2662380391001	515210	University Salary Payroll 06/30/08	5,500.00	20080630	
			43,323.19		

Payroll Detail

cost object	account	employee name	amount	post date	account desc
2662380391001	511100	Scott, Durelle T (Scotty)	1,941.50	20080530	Faculty - Permanent
2662380391001	511100	Scott, Durelle T (Scotty)	1,176.66	20080530	Faculty - Permanent
2662380391001	515210	Walters, Steven G	2,600.00	20080530	Graduate Assistants
2662380391001	519100	Scott, Durelle T (Scotty)	249.45	20080530	Retirement Contribution
2662380391001	519200	Scott, Durelle T (Scotty)	230.38	20080530	FICA Contribution
2662380391001	519300	Scott, Durelle T (Scotty)	346.46	20080530	Health Insurance Contribution
2662380391001	519400	Scott, Durelle T (Scotty)	0.94	20080530	Life Insurance Contribution
2662380391001	515210	Walters, Steven G	1,300.00	20080630	Graduate Assistants
2662380391001	515210	Soylu, Mehmet E	4,200.00	20080630	Graduate Assistants
			12,045.39		