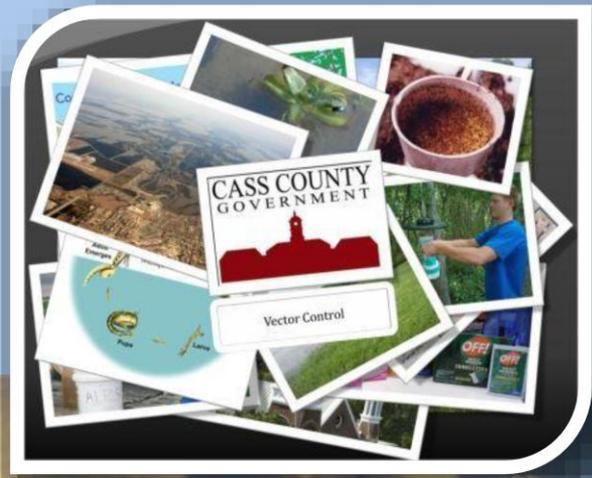


# 2010 Year End Review



Vector Control Board Meeting  
Wednesday, November 3<sup>rd</sup>, 2010  
9:30 AM  
Cass County Highway Department  
1201 Main Ave. West  
West Fargo, ND 58078

Note: Meeting will be conducted by Cass County Vector Control Board, but all persons/organizations involved in area mosquito abatement efforts are encouraged to attend.

Agenda	
Call to Order	
2010 Vector Control Season Review	Prather
2011 Draft Contracts- Fargo & West Fargo	Prather
2011 Meeting Schedule:	Prather/All
Discussion, Questions, & Comments	All
Adjourn	

# Material Usage In Standing Water

## 2010 Treatments to Standing Water Compared to Past Seasons:

- **232%** more material used than in 2009
- **175%** more material used than in 2008
- **168%** more material used than in 2007
- **295%** more material used than in 2006
- **295%** more material used than in 2005
- **435%** more material used than in 2004
- **385%** more material used than in 2003



**CCVC**  
Cass County Vector Control

Material totals were determined from inventory numbers and previous Vector Control Director year end reports.

Overall this season saw the largest use of larval control insecticides ever.

The following numbers represent material usage from the prior years.

Actual material applied:

**2010** (to Sept 17<sup>th</sup>): 55,421.8 Lbs

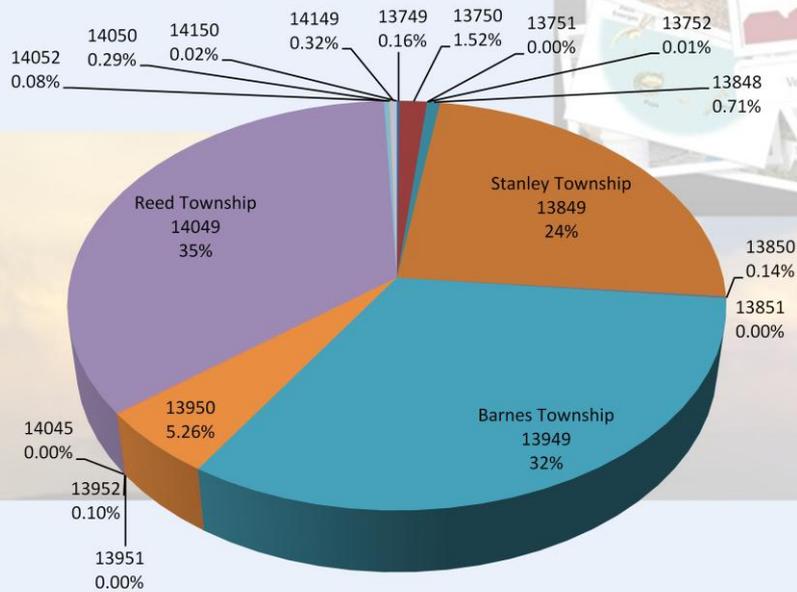
**2009:** 23,888.6 Lbs

**2008:** 31,633.2 Lbs

**2007:** 32,921 Lbs

**2006:** 15,351 Lbs.

# Allocation of Larviciding Materials Percentage

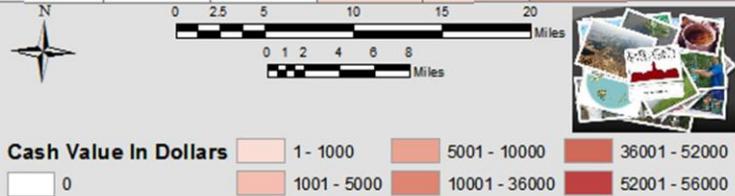
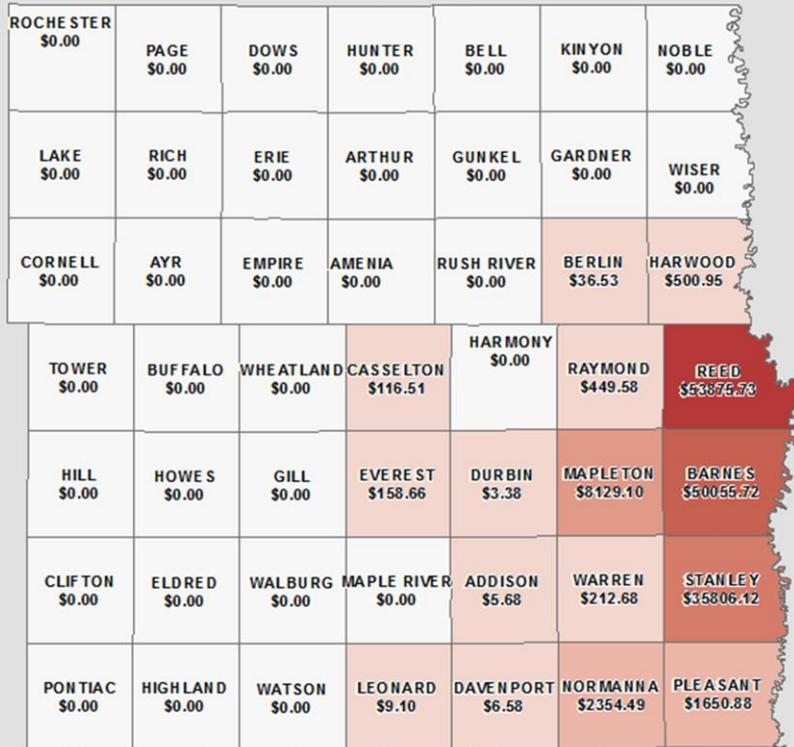


**CCVC**  
Cass County Vector Control

Figures here represent the cash value of larviciding materials placed into standing water through various townships designated by their number.

Fargo and West Fargo occupy all of Barnes Township and portions of both Stanley and Reed Townships

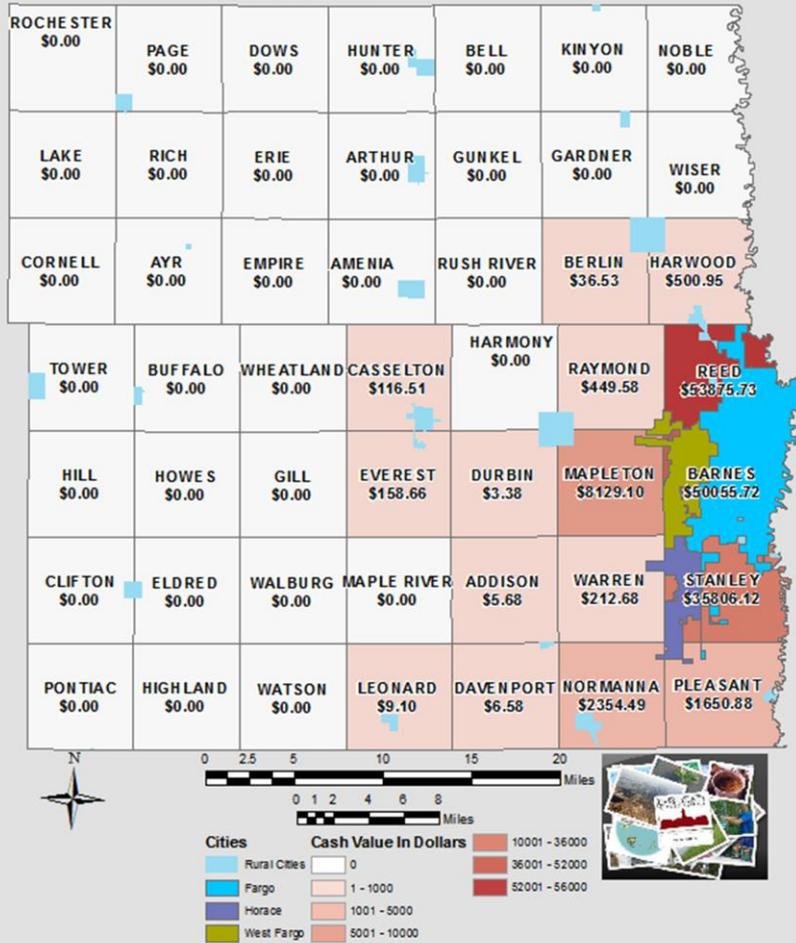
## 2010 Cost of Larvicides Applied in Townships



This map is a geographic representation of the cash value of materials that were applied to standing water as is proportionate to both population and revenue.

Township	Totals		
Reed - 14049	\$ 53,875.73	Casselton - 14052	\$ 116.51
Barnes - 13949	\$ 50,055.72	Berlin - 14150	\$ 36.53
Stanley - 13849	\$ 35,806.12	Leonard - 13752	\$ 9.10
Mapleton - 13950	\$ 8,129.10	Davenport - 13751	\$ 6.58
Normanna - 13750	\$ 2,354.49	Addison - 13851	\$ 5.68
Pleasant - 13749	\$ 1,650.08	Durbin - 13951	\$ 3.38
Harwood - 14149	\$ 500.95	<b>Total</b>	<b>\$ 154,544.88</b>
Raymond - 14050	\$ 449.58		
Warren - 13850	\$ 212.68		
Everest - 13952	\$ 158.66		

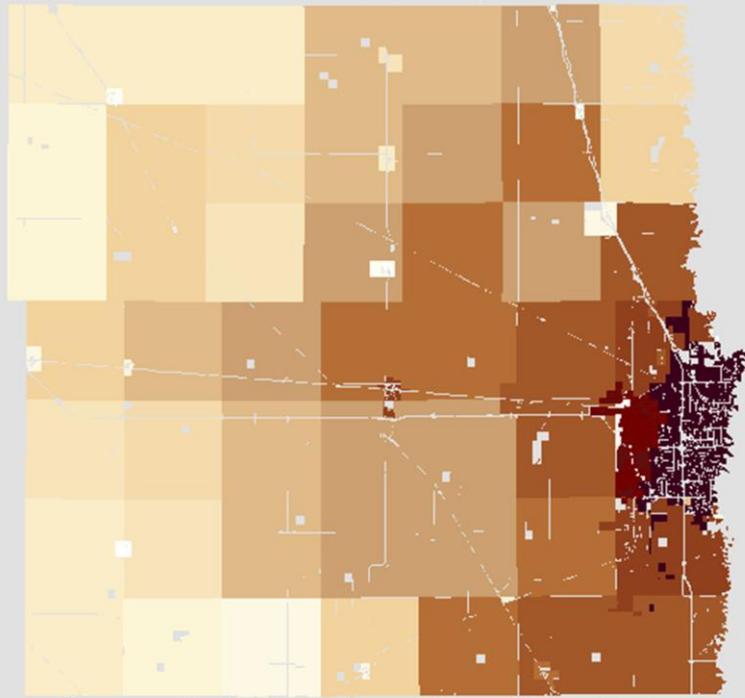
## 2010 Cost of Larvicides Applied in Townships



Here again is a geographic representation of the cash value of larviciding materials applied by Cass County Vector Control with cities represented.

Cities not represented her by larval control materials received applications of adult control materials at some point during the season.

## 2010 Vector Control Revenue by Tax Jurisdiction



Revenue In Dollars	423.83 - 510.63	510.64 - 563.20	563.21 - 635.86	635.87 - 673.17	673.18 - 769.60	769.61 - 845.20	845.21 - 1,039.04	1,039.05 - 1,418.22	1,418.23 - 2,294.07	2,294.08 - 7,783.15	7,783.16 - 135,814.83	135,814.84 - 659,345.10
2.97 - 65.64	65.65 - 272.98	272.99 - 423.82										

Vector Control revenue by tax jurisdiction.

Please note that these figures do not contain adult spraying revenue for cities other than Fargo and West Fargo. Contracted services for adulticiding in rural cities equals approximately 2% of the total budget and is not represented here.

A detailed list of revenue by cities and townships as well as this map are available at :

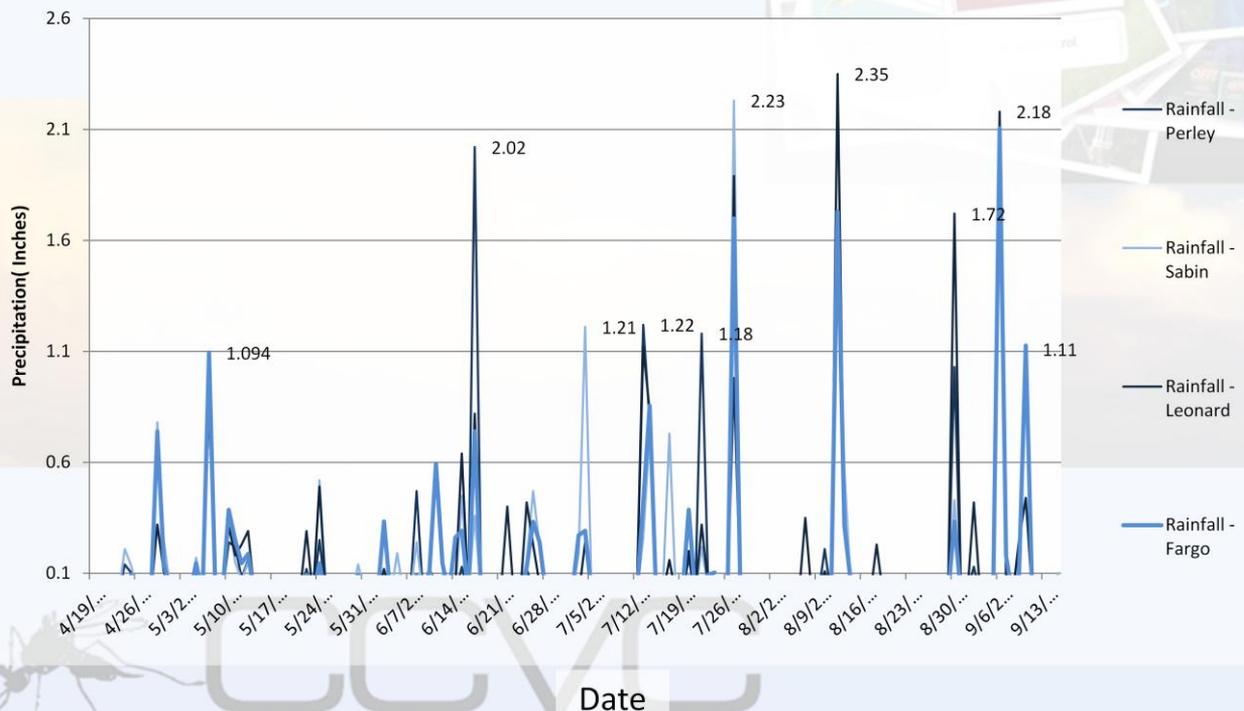
<http://www.casscountynd.gov/county/depts/Vector/residents/Pages/Revenue.aspx>

# Cause and Effect: Conditions, Weather, And Adult Mosquitoes



**CCVC**  
Cass County Vector Control

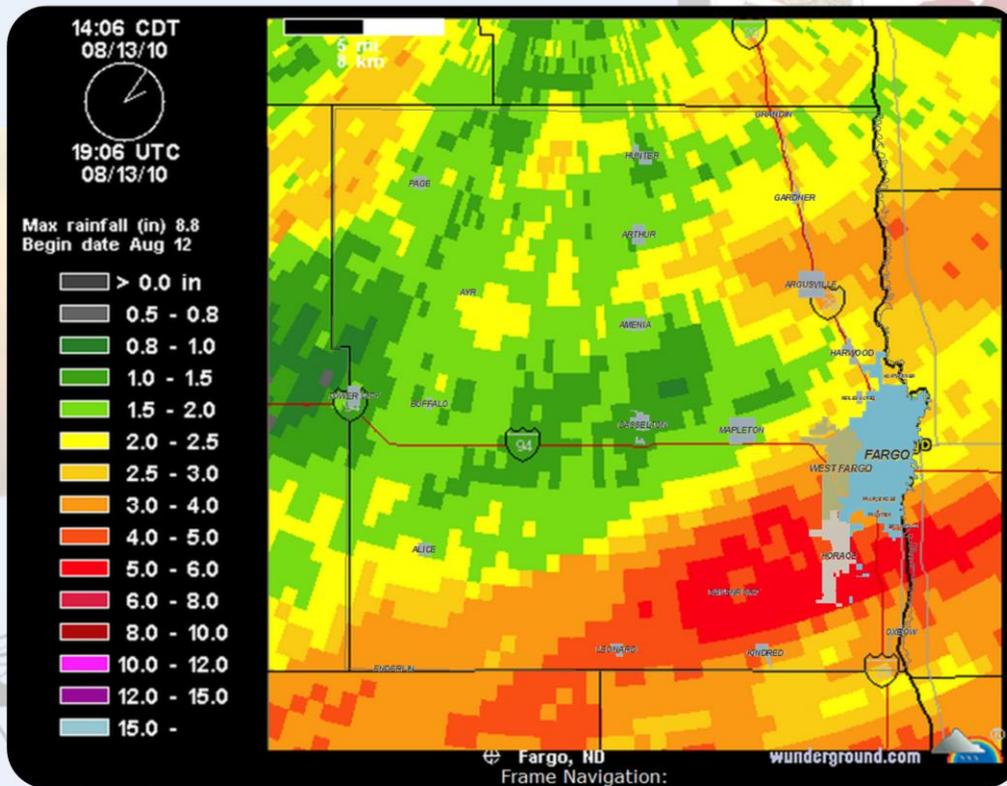
# Region Wide Recurring Significant Rain: Number of Events



The information displayed in this graph was collected from NDAWN, the North Dakota Agricultural Weather Network. The graph represents a number of different weather stations around Fargo including some located across the river in Minnesota. Overall there were several significant events in 2010. “Significant” in terms of vector control is approximately one inch of rain from any storm system over a few days.

Many weather events tracked north or south of the official Hector International weather station, therefore the closest four regional sites were selected for demonstration purposes. For example: a weather system that impacted Sabin (8 miles from S. Fargo) produced significant rainfall totals near the metro particularly south and west of the airport on 7/5/2010.

# Region Wide Recurring Significant Rain: Scope



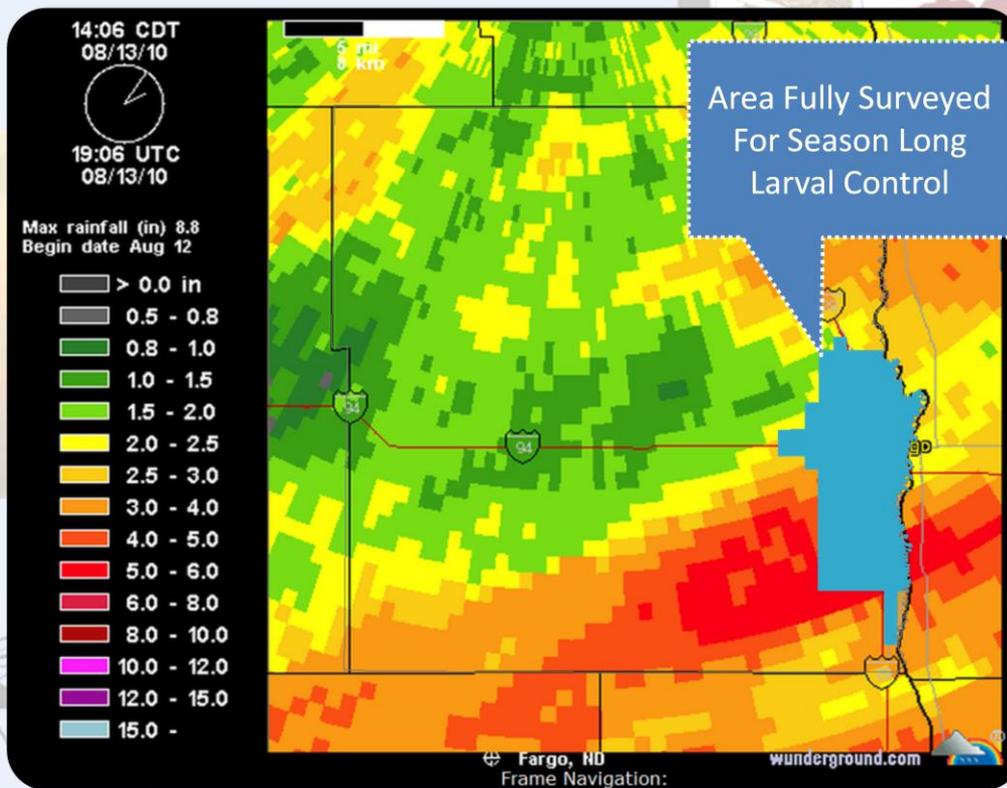
One visual example: A powerful storm system passed through the area in mid August.

The image above shows radar indicated rainfall totals from 8/13/2010 in Cass County. Cities are on top of the image.

During this event almost the entire county received rain totals over one inch. Several hundred square miles received rainfall totals in excess of 3 inches or more.

Most of the Metro area received well over 2 inches of rain.

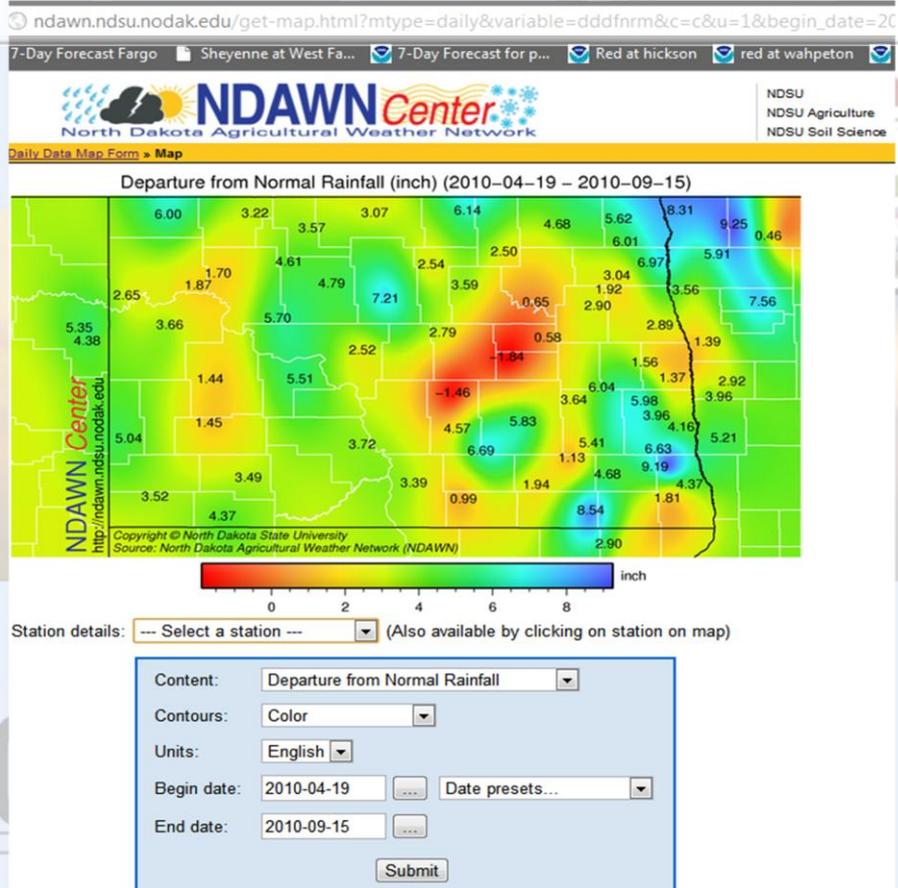
# County Wide Larviciding Not Possible



In context of that single event, the area that receives full larval control is quite small in comparison to the scope of the area that was affected.

This one event created several weeks of high adult counts into mid September for all residents of Cass County.

# Climate: Departures From Normal

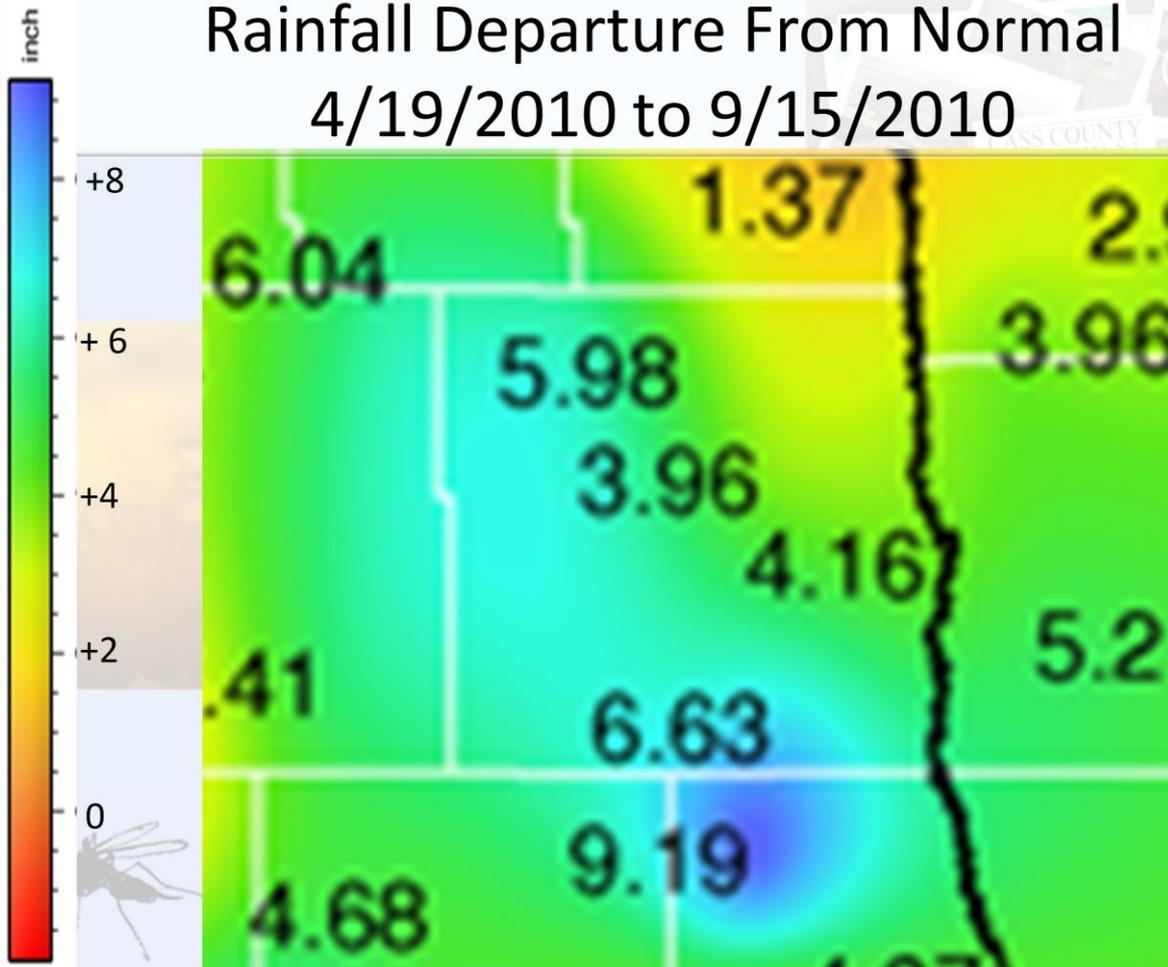


Overall, regional rainfalls varied from almost 10 inches over average for the season (Richland & Cass Counties) to about 2 inches under average for the center of the state.

Places like the Twin Cities saw over a dozen significant rain events for the season.

Fortunately, none of the storm events were severe enough along the Red and Sheyenne tributaries to flood to a depth needed to create mosquito breeding from river overflow.

## Rainfall Departure From Normal 4/19/2010 to 9/15/2010



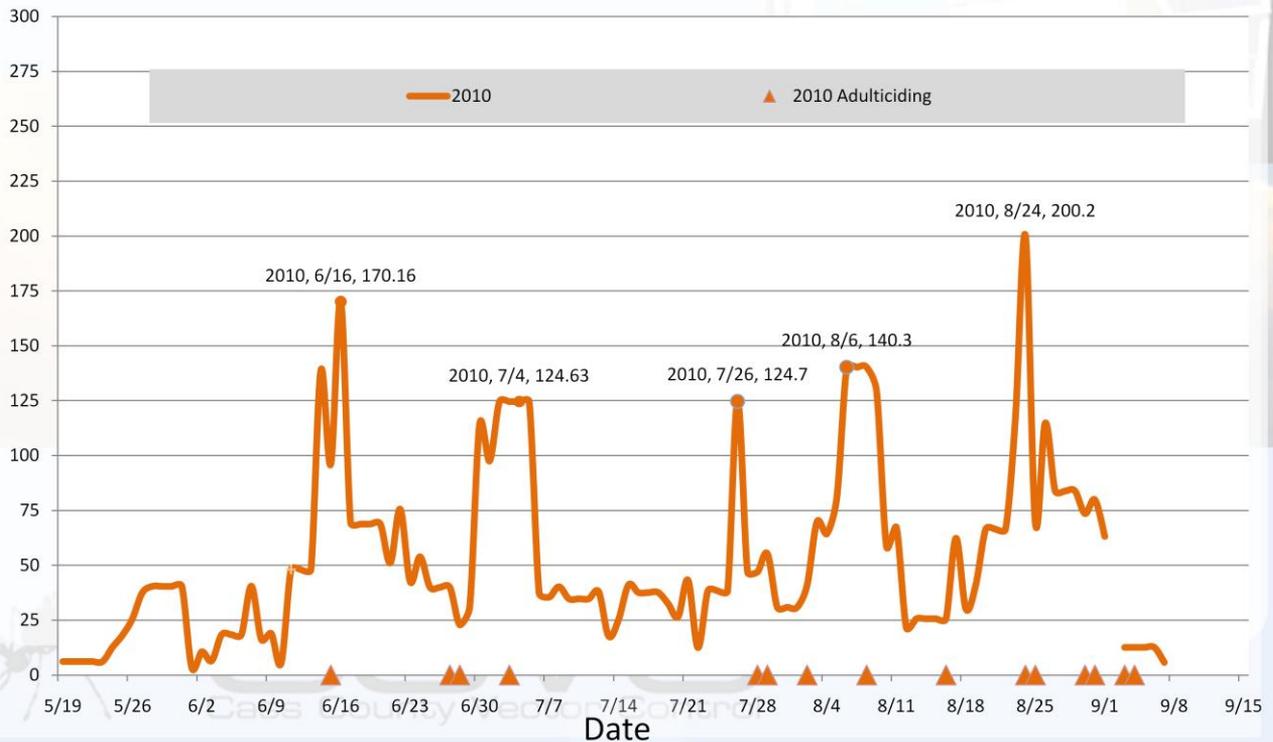
Even though there was no significant flooding, rainfall locally was significantly above average.

Fargo Hector International saw an additional 4 inches of precipitation for the growing season. Other areas: Leonard, ND 6.6 inches above average. Sabin, MN 5.2 inches above average.

Mosquito problems were felt up and down the valley. Numerous cities in the region were actively spraying for adult mosquitoes into September via aircraft and other means.

# Ultimately Adult Mosquitoes Still Emerged and Caused Annoyance

Male and Female Combined Citywide Average 2010

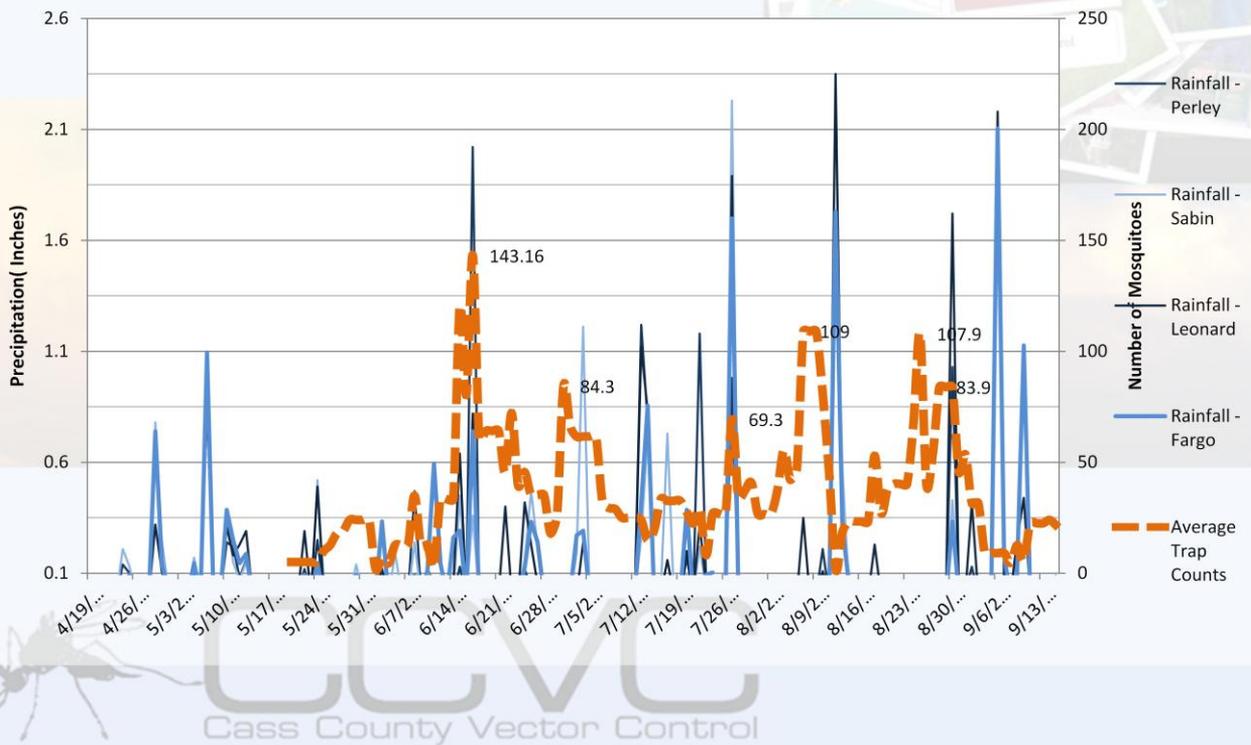


This graph represents BOTH female and male mosquito counts. Currently only female counts are used for threshold purposes and public information. Here, combined totals are used for comparison to previous seasons. In the future female counts will be the consistent measure.

The frequent spikes of adult mosquitoes seen here were proportionate to recurring severe rainfall events. Development was also pushed by consistent heat and sunshine after each severe weather event. Weather conditions were generally quite pleasant, warm, and still for a North Dakota summer.

Adult mosquito migration did become an issue late in the season- August to September that required numerous adult control applications to mitigate them.

## Out Breaks of Adult Mosquitoes Trailed Weather Events by 12-14 days:



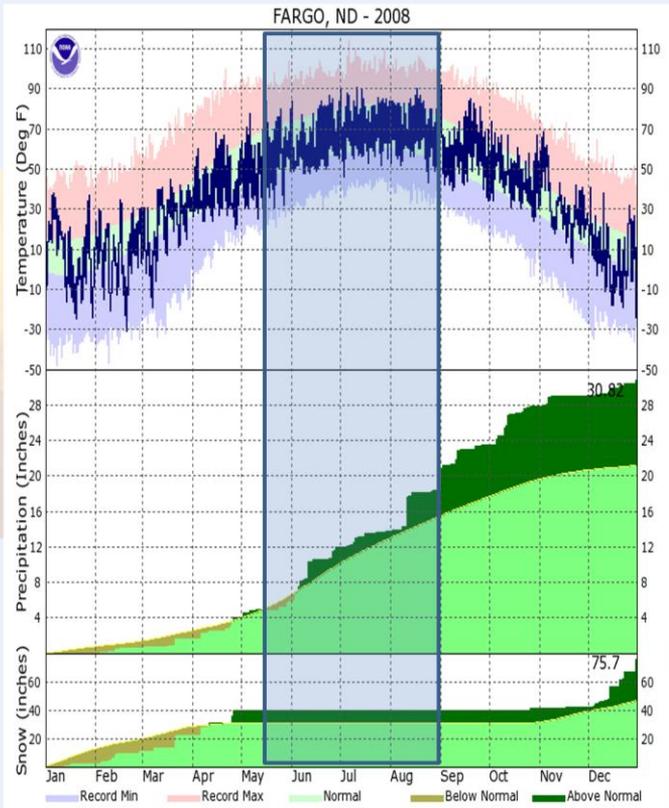
High counts of adult mosquitoes in 2010 are consistent with rainfall events experienced and mosquito ecology. Above is the metro female trap count average for the 2010 season applied over the precipitation data seen earlier.

This cycle is the nature of mosquito population dynamics. However, this season conditions were particularly challenging given the regularity and frequency of events compared to recent seasons.

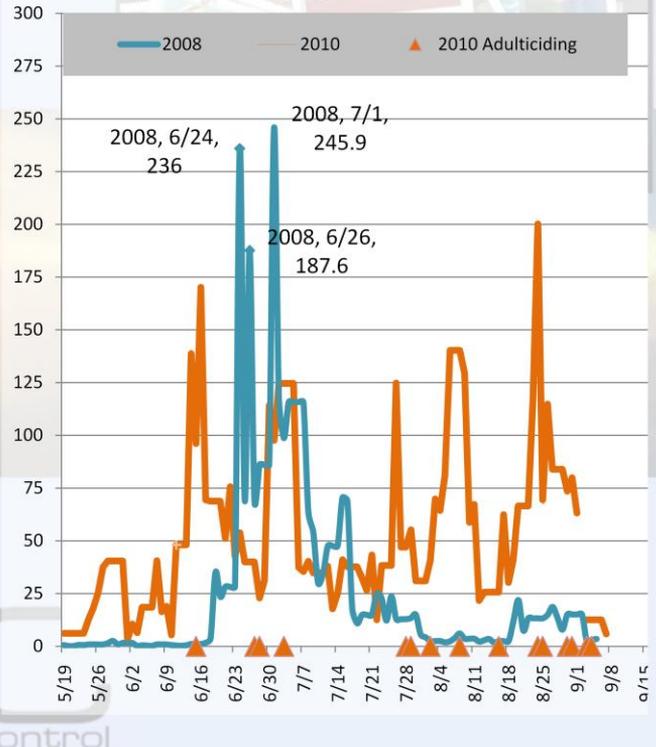
July through August rainfall occurred on a weekly basis which never allowed the ground to dry. Thus, every rain pooled over saturated soils and created breeding habitat.

A good example of the rainfall/mosquitoes cycle can be seen over the last several years:

# 2008 Weather Conditions And Mosquitoes



## Male and Female Combined Citywide Averages 2008 & 2010



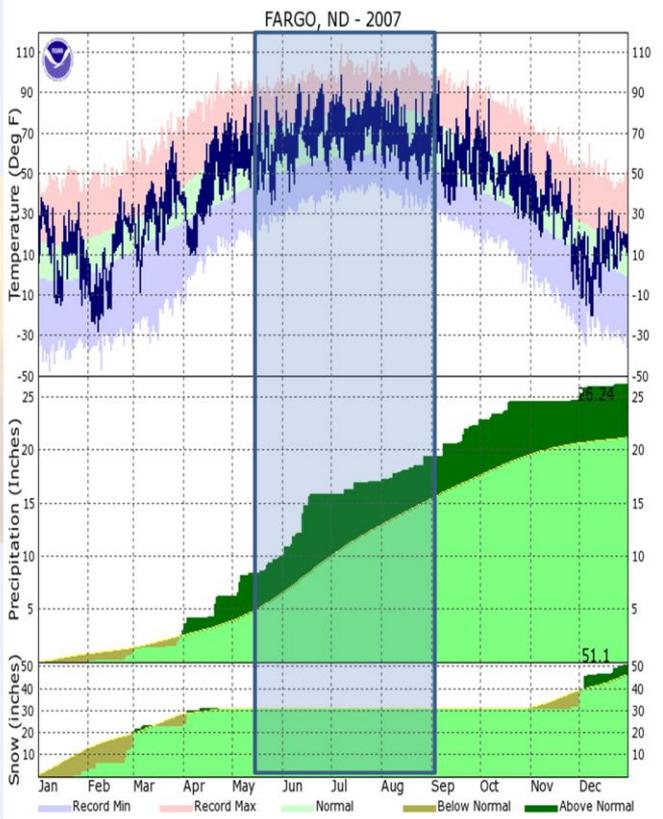
The graph on right displays daily average mosquito counts from 2008 (blue line) compared to same measurement in 2010 (orange line).

To the left is a National Weather Service graph representing temperature (top row), precipitation (middle), and snowfall (bottom). The shaded rectangle on top of all rows highlights our typical mosquito season. The top row of the graph shows observed temperature (dark blue zig-zag line) overlaid on the average temperature range (thick yellow line barely visible). Above and below show record high temp and low temp ranges are red and light blue regions, respectively.

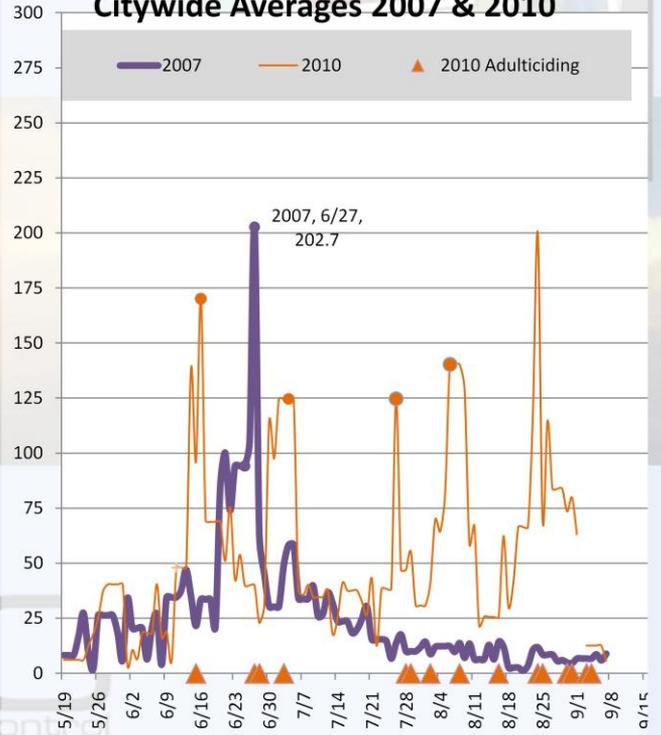
Most interestingly, the middle row shows rainfall events and totals. Each vertical jump the line makes indicates an increase in precipitation. Note that from June 5<sup>th</sup> to June 15<sup>th</sup> there are at least two major rainfall events, each about two inches or more.

Coincidentally on the right hand graph of adult mosquito population- there is a major outbreak of adults approximately two weeks after the first major rain and again a week later- mirroring the same rainfall/mosquito cycle.

# 2007 Weather Conditions and Mosquitoes



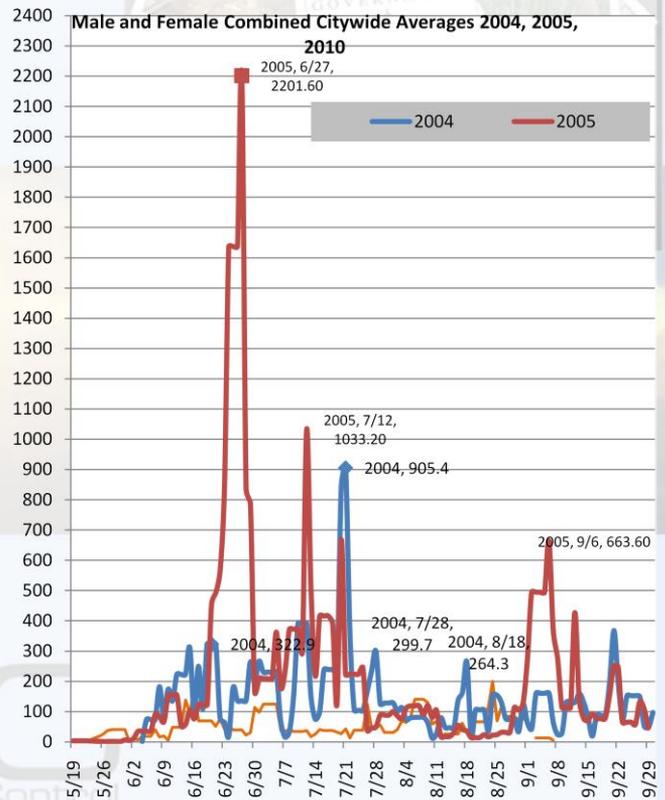
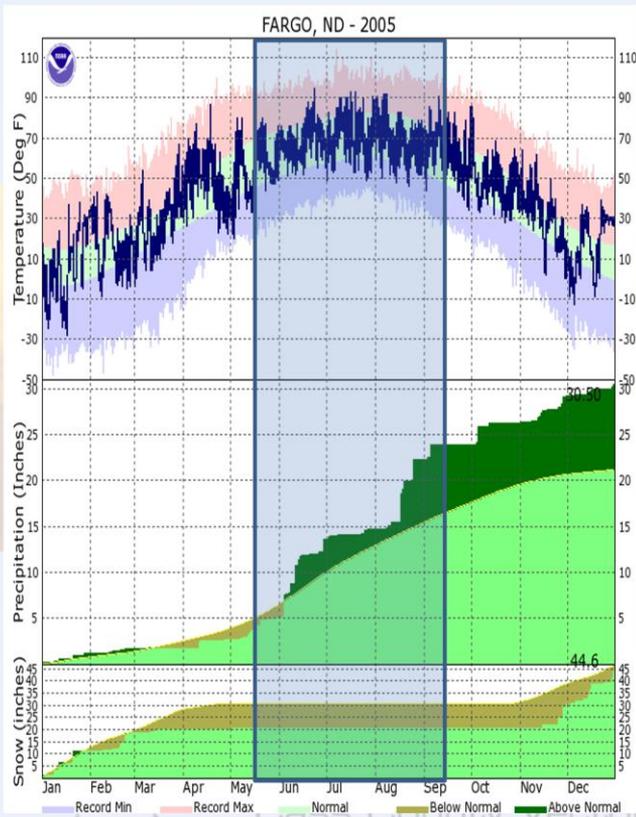
## Male and Female Combined Citywide Averages 2007 & 2010



Again, in 2007 the relationship is obvious. Note the very pronounced increase in precipitation around the 15 of June on the NWS graph on the right.

Approximately 12- 14 days later, a major increase in the adult mosquito population on June 27, 2007 occurred.

# 2005 Weather Conditions and Mosquitoes



A last example of this cycle of rainfall and mosquitoes is Summer 2005- an extremely challenging year.

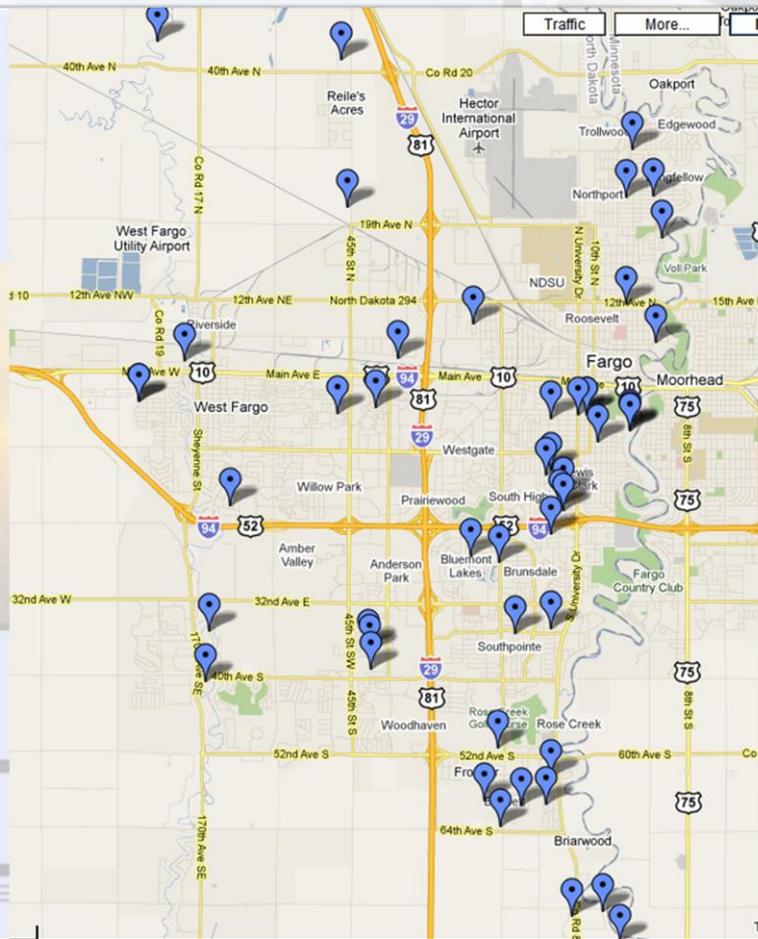
On the right, adult collection average in red on the right paired with the weather graph on the left. That season over 6 inches of rain fell over a few days in early June followed by a massive spike of over 2200 mosquitoes per trap average on June 27<sup>th</sup> 2005.

Again, in the last week in June, another 2 or more inches fell followed by a 1,000 mosquito average on July 12<sup>th</sup> 2005.

Finally, another severe downpour resulting in almost five inches of rain in mid August of that year created a 600 average on Sept. 6<sup>th</sup>.

Ultimately, rain produces mosquitoes. Over the years, statistically we have seen a decrease in the amplitude of the mosquito population. However this season the frequency was unavoidable.

# Resident Complaints to 9/21/2010



\*Only callers who left an address

The public noticed elevated mosquito counts numerous times throughout the season. This graphic represents residents who called this season with complaints of adult mosquitoes and left an address.

The intention was to help identify possible hotspots for any one event. In general there was no major trend for any given week or event when these addresses were mapped. More often than not, a complaint when investigated, did not match an elevated New Jersey Light Trap count or CO2 trap count. The clusters seen indicate human population more than mosquito population.

The most calls tallied from a particular area in a weeks time was about three.

Nonetheless, it could be said that the public felt that conditions were challenging regardless of effort.

# Completed ULV Applications Fargo And West Fargo - 2010



 Aerial Application  
 Ground Application  
 Combined Application



  
 Cass County Vector Control

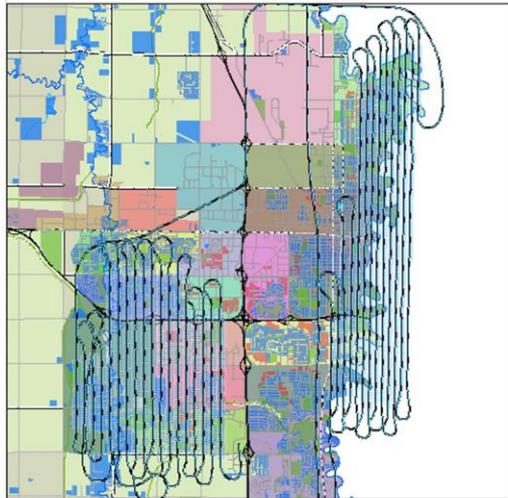
## All Adult Control Applications in 2010 up to September 16<sup>th</sup>

Reed Twp Sub.		1
Aerial and Ground Control Applications For Fargo and West Fargo		1
Aerial Application Fargo, West Fargo, and Cass County Urban Fringe Subdivisions		2
Bakke Subdivision		10
Braaten Subdivision		4
Brooktree Park Subdivision		1
Butch-R-Block Subdivision		4
Cities of Fargo and West Fargo		11
	Sunday, July 04, 2010	1
	Thursday, July 29, 2010	1
	Friday, July 30, 2010	1
	Tuesday, August 03, 2010	1
	Monday, August 09, 2010	1
	Tuesday, August 17, 2010	1
	Tuesday, August 31, 2010	1
	Saturday, September 04, 2010	1
	Tuesday, September 14, 2010	1
	Thursday, September 16, 2010	1

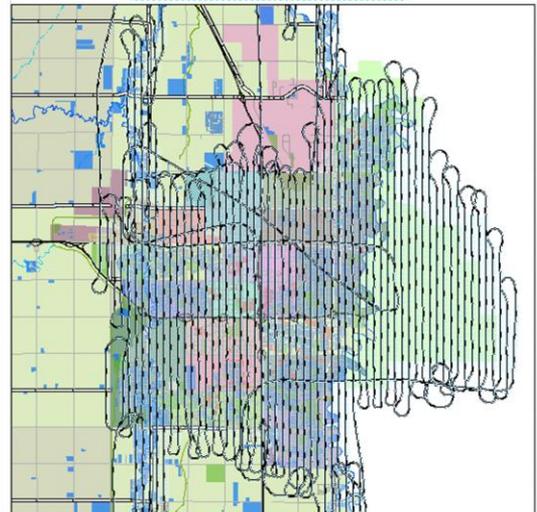
City of Arthur		5
City of Brooktree Park		1
City of Frontier		2
City of Gardner		3
City of Harwood		10
City of Hunter		6
City of Kindred		7
City of Leonard		6
City of Mapleton		6
City of North River		4
Erie Village		3
Fargo Country Club		1
Keller's Acres Subdivision (In Pleasant Township)		1
Normanna Township Subdivisions		1
Pleasant Township Subdivisions		2
Reed Township Subdivisions		1
Round Hill Subdivision		1
Stanley Township Subdivisions		5
Urban Subdivisions in Stanley and Reed Townships		2
Willowcreek Subdivision		1
Grand Total		102

# Aerial Applications

October 8th Aerial Spray



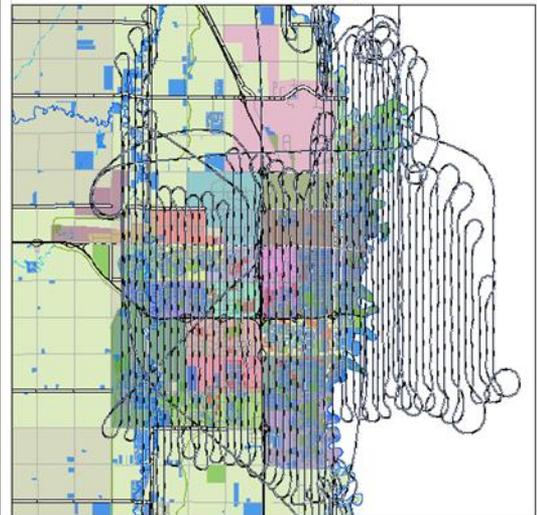
Sept. 4th and 5th Aerial Spray



August 25th Aerial Spray



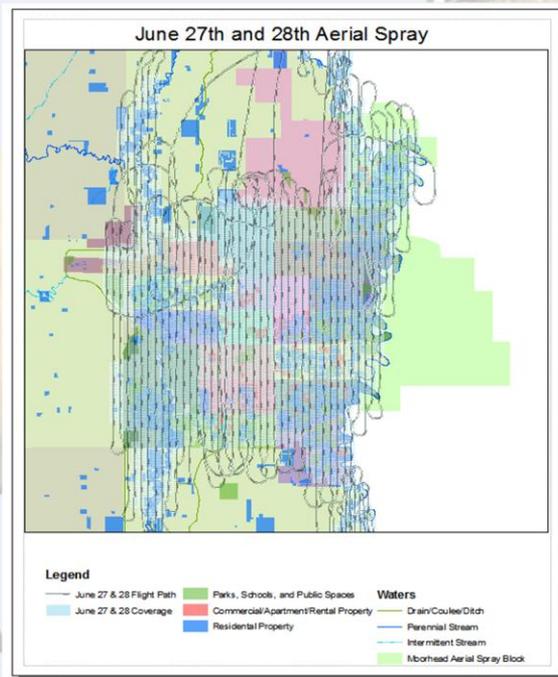
July 29th Aerial Spray



Cass County Vector Control

Cass County Vector Control

# Aerial Applications

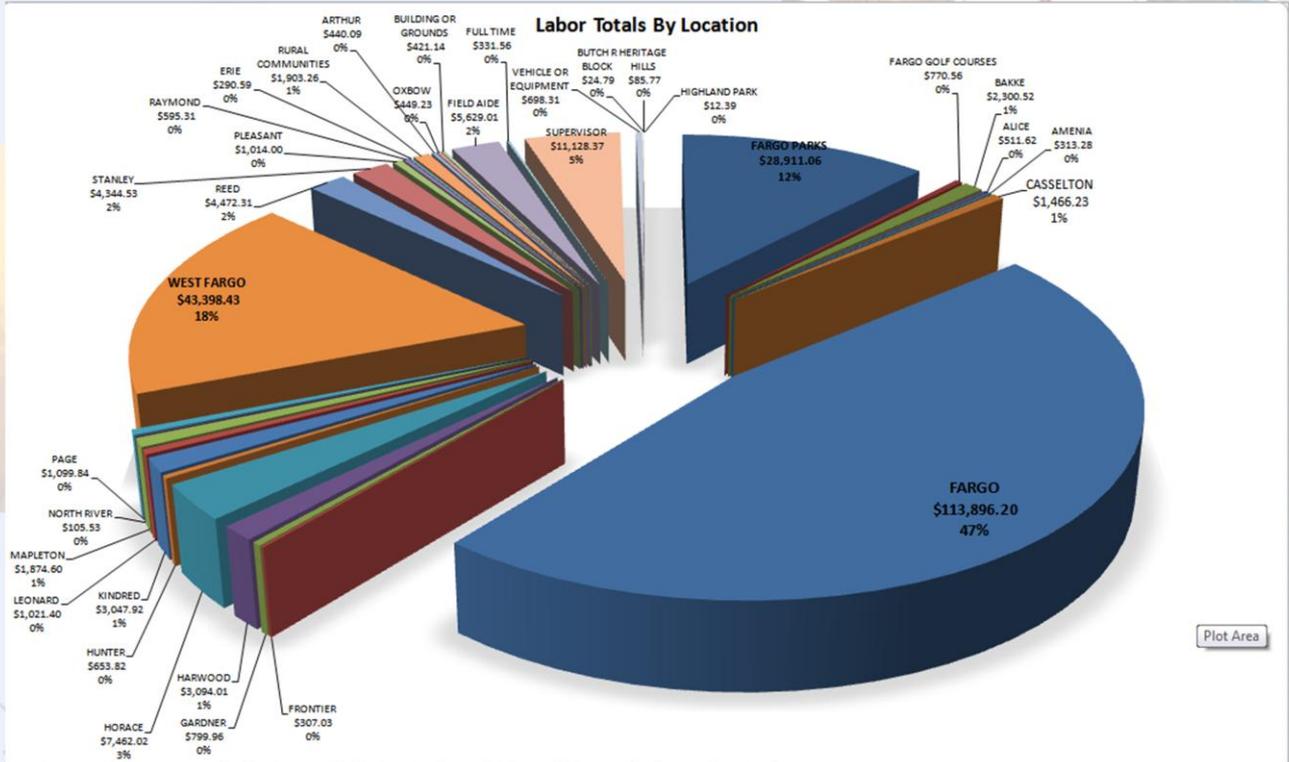


Cass County Vector Control

## Adult Control Applications: Ground and Aerial

- Aggressively attacked adult mosquito population when needed- several times per week at highest points - one more June application would have been helpful
- Effective use of the aircraft – particularly useful during challenging fall conditions
- 35 female count threshold is challenging and progressive in the scope of history-trap count based thresholds are guided step forward
  - reflects nuisance to people more accurately than ever
  - allows for a baseline to exist without constant spraying
    - That is, the threshold is high enough that there are “no spray” conditions and nights
    - Might require a more detailed look into smaller scale applications i.e. neighborhood treatments or “sections” of town when some traps are well elevated above threshold or citizen unrest is high
      - Difficult to judge scope of problems and scale of response needed when basis is only from citizen complaints
      - No clear pattern emerged from public complaints
      - Public perception could become an issue

# Labor by Geography

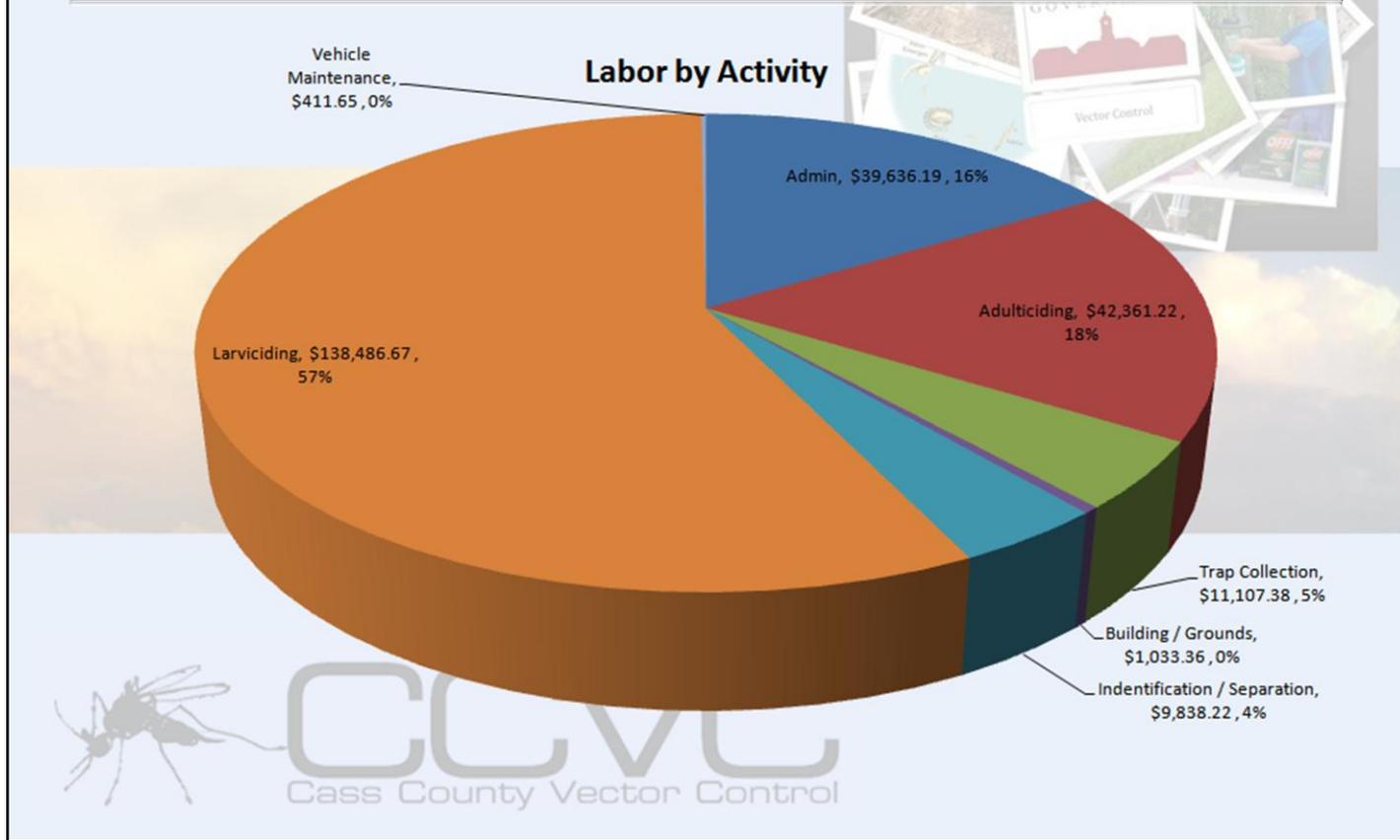


Labor figures include April through September 15 labor only but do not include full time staff. However, work shifts occurred into October this season.

The data for these graphs is compiled from entries into payroll. Primarily, the focus is the Metro- City of Fargo, West Fargo, and Fargo Parks.

Labor hours for Fargo, West Fargo, and Fargo Parks not including training and administration equals about 77% of total dollar amount spent.

# Labor by Task



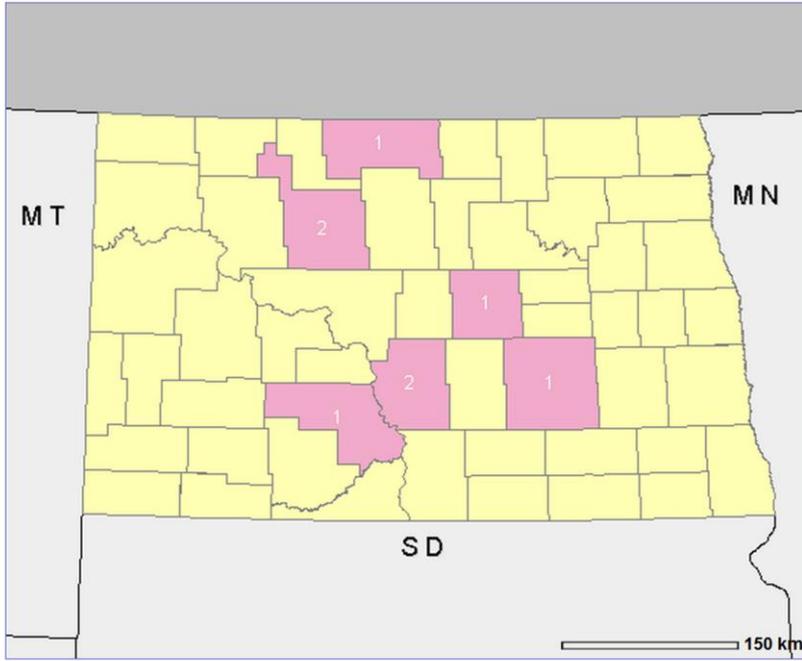
When looking at seasonal labor in light of core functions, a majority of time was spent treating standing water this season. Administrative costs were lower than previous years.

Adult mosquito control hours were a significant portion of labor expenditures . This adulticiding labor total includes contracted labor such as truck mounted fogging and back pack spraying in both the urban an rural cities.

# West Nile Virus

USA > North Dakota

Select State



Background

Historical Data

FAQs

Links

 Canadian WNV Human Surveillance

**Did You Know?**

You can also navigate to Adjacent States by clicking on them.

**Legend**

-  Positive Test Results\*
-  No Positive Test Results\*\*
-  Historically Not Found

\* Data demonstrates local jurisdiction of residence necessarily the locale where the infection was acquired  
\*\* States and counties in yellow are those in which been reported historically, but no positive test result reported or no surveillance has occurred this year.



Cumulative 2010 Data as of 3 am, Oct 19, 2010

These data are provisional and may be revised or adjusted in the future.

Cass County Vector Control

To date there have been no confirmed cases of West Nile Virus in the Red River Valley.

**Thank you for your attention.**

Prepared by:

**Ben Prather**

**Vector Control Director**

**Cass County, ND**

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