NWS FORM E-5 U.S. DEPARTMENT OF COMMERCE
NOAA, NATIONAL WEATHER SERVICE

HSA OFFICE:
NWS Northern Indiana (IWX)

REPORT FOR (MONTH &YEAR):
January, 2006

MONTHLY REPORT OF RIVER AND FLOOD CONDITIONS

DATE:
February 3, 2006

TO: HYDROMETEOROLOGICAL INFO CENTER (W/OS31)
SSMC 2 – Rm. 13468
1325 EAST – WEST Highway
SILVER SPRING, MD 20910 –3283

SIGNATURE:
Michael Sabones, MIC
Greg Lamberty, Service Hydrologist

When no flooding occurs include miscellaneous river conditions such as significant rises, record low stages, ice conditions, snow cover, droughts, and hydrologic products issued (NWS Directive 10-924).

☐ An **X** inside this box indicates that no flooding occurred within this Hydrologic Service Area.

General Overview: January 2006 was the warmest January on record across Northern Indiana, Northwest Ohio, and Extreme Southern Lower Michigan. January 2006 was also wetter than normal across the area. Precipitation averaged 0.78 inches above normal. Temperatures averaged 12.9 ^{o}F above normal. (Only NWS Fort Wayne and South Bend data were used).

For the month of **January**, the average high temperature was in the lower 40s, the average low temperature was around 30 ^{o}F giving an average temperature in the mid 30s. (Only NWS Fort Wayne and South Bend data were used).

There were three significant precipitation events that occurred in January 2006. All three were rain events. The most significant event occurred from January 10th through the 14th when an average of around 0.8 inches of rain fell across the area (COOP Data). The second occurred from the 28th through the 31st of January where an average of just under 0.8 inches fell (COOP Data). The third event occurred from January 16th through the 18th when just under 0.6 inches of precipitation (COOP Data). This event ended with a light snowfall. Snowfall amounts with this system averaged around one inch (COOP Data). The second two led to minor flooding in Northwest Ohio.

The first event began on the 10th and ended on the14th and was mostly rain. This event produced the greatest rainfall totals with most of the precipitation falling on the 13th and 14th. River levels had receded from the last December 2005 and early January 2006 rainfall and snow melt, but rose quickly again across the entire region, even in the drier northwest corner of the area. The Kankakee River at Davis, Indiana rose from around 6.7 on the 13th feet to around 7.5 feet by the 15th. Other rivers and stream had greater rises. However, all rivers remained in their banks during this event.

The second event began on the 16th and ended on the 18th. It began as rain and ended with snow. This event led to renewed rises on rivers especially in Northwest Ohio and

Northeast Indiana. Flood Warnings (FLWs) were issued for flood threats on the St. Joseph Ohio in Northeast Indiana and Northwest Ohio and on the Auglaize and Tiffin Rivers in Northwest Ohio. The event ended in snow which reduced the flood threat along the St. Joseph River Ohio and the Auglaize River in Northwest Ohio, but did not avert flooding along the Tiffin in Northwest Ohio. The snow melted by the 19th causing minor flooding along the Tiffin. But that was the only river that had any flood problems due to the melting snow.

The third event occurred from January 28th and lasted through January 31st. This event was a rain event. With rivers already high, the rainfall from this event caused a renewed flood threat along both the Tiffin and St. Joseph Rivers. Flood Warnings (FLWs) were issued for points along both rivers. Only the Tiffin River overflowed its banks.

Soil Moisture and River Levels: Soil moisture levels continued to improve across the Western Lower Great Lakes region in January 2006. Moderate Drought was restricted to Northwest Indiana. Other areas improved so much that parts of South-Central and Southeast Michigan have unusually moist soil moisture conditions. **The Palmer Drought Severity Index numbers** calculated for data through January 28, 2006 are as follows: Northwest Indiana (-2.17, Moderate Drought), North-Central Indiana (-1.25, Dry Side of Normal), Northeast Indiana (-0.48, Normal), Southwest Lower Michigan (+1.38, Moist Side of Normal), South-Central Lower Michigan (+2.15, Unusually Moist Spell), Southeast Lower Michigan (+2.70, Unusually Moist Spell) and Northwest Ohio (+1.75, Moist Side of Normal).

As of February 2, 2006, river flows in the far Northern Indiana were in the 75 to 89 percentile range whereas flows in the rest of Northern Indiana were in the 25 to74 percentile range. Southern Lower Michigan saw flows of some rivers in the 75 to 89 percentile range and others in the 25 to 74 percentile range. Flows in most Northwest Ohio rivers were in a wide range from the 24 to 89 percentile range. Most gauges were in the 75 to 89 percentile range. A couple of gauges reported flows in the "Greater than 90" percentile range. So in general, river flows continue to rebound from the summer drought. River data was provided by the United States Geological Survey.

Temperature: At Fort Wayne, the average high temperature in January 2006 was 43.1 °F and the average low temperature was 30.6 °F. This gave an average temperature of 36.9 °F which was 13.3 °F above normal. At Fort Wayne, the warmest temperature reached in January 2006 was 55 °F on the 28th. The coldest temperature reached was 21 °F on the 26th. The record for the warmest minimum temperature was shattered on the 20th when the low temperature only reached 50 °F. The previous record was 39 °F set back in 1921. The record for the warmest low temperature was also broken for January 29th when the low only fell to 43 °F. January 2006 was the warmest January on record.

At South Bend, the average high temperature was 41.7 °F and the average low temperature was 30.0 °F giving an average temperature of 35.8 °F which was 12.4 °F above normal for **January**. The warmest temperature occurred on January 12th (55 °F) and the coldest temperature occurred on the 26th (20 °F). The record high temperature was tied both on the

19th (53 °F) and on the 20th (52 °F). Records for the warmest low temperatures were set on the 11th (36 °F), the 28th (40 °F) and on the 29th (42 °F). January 2006 was also the warmest January on record.

So little snow fell in January and with record warmth, no snow remained on the ground as January 2006 ended.

Precipitation: Precipitation was above normal at both South Bend and Fort Wayne in January 2006. At Fort Wayne, 3.01 inches of precipitation fell, 0.96 inches above normal. Snowfall totaled only 2 inches in January 2006, 7.9 inches below normal. At South Bend, 2.87 inches of precipitation fell, 0.60 inches above normal. January 2006 was the first month since February 2005 with above normal precipitation. Snowfall totaled only 3.4 inches, 19.8 inches below normal.

Weather: January 2006 over the Western Lower Great Lakes Region was a month of record warmth, much warmer than December 2005 was cold. Temperatures averaged 12.9 °F above normal. Maritime tropical air masses dominated the area throughout January 2006.

A strong jet stream across the Pacific Ocean kept cold air masses bottled up in Canada and over in Asia. However a series of storm systems rode their way across the region bringing periods of rain and in rare cases some snow to the region. The first 4 days of January saw high temperatures reach the lower to mid 40s. Light to moderate mostly rain showers peppered the region from the 1st through the 5th. Precipitation totals in this event were around a third of an inch (COOP Data). River levels from the flooding of December 2005 across Northwest Ohio and Northeast Indiana continued to recede. This rainfall just slowed its recession.

A weak cold front passed across the area on the 5th dropping high temperatures back into the 30s. This somewhat cool spell lasted only to the 8th when highs again reached the mid 40s. Another weak cold front crossed the area on the 9th and 10th dropping temperatures back into the upper 30s. Another storm system crossed the Western Lower Great Lakes on the 10th, lasting into the 14th. An average of around 0.8 inches of rain fell across Northern Indiana, Northwest Ohio and Extreme Southern Lower Michigan (COOP Data). Warm air ahead of the storm system brought high temperatures into the mid 50s by the 12th. Highs remained in the 50s on the 13th as well, but another weak cold front crossed the area ending the precipitation with a trace of snow. Highs dropped back into the mid 30s on the 14th.

With the main source of cold air bottled up in Canada, little additional cooling followed this storm system. High temperatures rebounded back into the 40s by the 16th. A stronger storm then moved toward the area on the 18th bringing more precipitation, however a more significant snow followed the initial rainfall. As much as 4 inches of snow fell in Northwest Ohio with this system. The total precipitation amounts averaged around 0.6 inches (COOP Data). This snowfall set the stage for minor flooding along the Tiffin River near Stryker. Cold air followed this system driving highs back into the lower 30s on the 18th.

Warm air advanced ahead of the next storm system quickly melted the freshly fallen snow. The resulting runoff caused the Tiffin River in Northwest Ohio to flood on the 20th. High temperatures reached the lower 50s on the 19th. Highs in the 50s persisted into the early morning of the 21st. This storm system was quite strong spreading heavy snow across parts of Southern Michigan, Northern Illinois and Southern Wisconsin late on the 20th and on the 21st. Most of the snow missed the Northern Indiana, Extreme Southern Lower Michigan and Northwest Ohio, with just light rain falling. An average of about a third of an inch of precipitation fell across the area with a light dusting of snow following the rain in most places (COOP Data). However in Southwest Lower Michigan and parts of Northwest and North-Central Indiana heavier snow fell with reports of 6 inches of snow over Far Southwest Lower Michigan being reported.

Another weak cold spell followed the storm dropping high temperatures back into the mid to upper 30s by the 22nd. These cooler temperatures persisted into the 26th. Another weak system crossed the area brought a period of light snow to the area. There was no significant accumulation with this system with the precipitation total being less than a tenth of an inch (COOP Data).

The next system crossed the area bringing another shot of warm air into the region. High temperatures on the 27th rose into the mid 40s to around 50 ^{o}F, reaching the lower to mid 50s by the 28th. Rains from this system averaged around 0.8 inches (COOP Data). The rainfall was enough to cause minor flooding on the Tiffin River near Stryker Ohio which did not occur until February 1st. The precipitation lasted into the 31st ending with another dusting of light snow. Snow accumulations were less than an inch. High temperatures fell through the 40s on the 30th down to the mid 30s by the 31st.

For January 2006, Daily River and Lake Summaries (RVDs) and the Daily Hydrologic Summaries (RVAs) were issued as usual to disseminate river and precipitation information and daily river forecasts. Four Hydrologic Outlooks (ESFs) were issued to disseminate probabilistic forecast numbers associated with the Advanced Hydrologic Prediction Service (AHPS) for the Maumee, St. Joseph (Michigan), the Kankakee and the Upper Wabash River Basins. Forty-four Hydrologic Statements (RVSs) were issued to disseminate river forecasts. Four Flood Warnings (FLWs) were issued to cover the flood threat along rivers in Northeast Indiana and Northwest Ohio. Twenty-eight Flood Statements (FLSs) were issued to cover river flooding in Northeast Indiana and Northwest Ohio. Six Flood Watches (FFAs) were issued to cover flood threats in Northeast Indiana and Northwest Ohio. No Flash Flood Warnings (FFW), Flash Flood Statements (FFSs), Areal Flood Statements (FLSs) or Areal Flood Warnings (FLWs) were issued in January 2006.

All temperature data used is from NWS Fort Wayne and South Bend data only. All precipitation data used are from COOP Weather Observers and from NWS Fort Wayne and South Bend.

NWS FORM E-5 U.S. DEPARTMENT OF COMMERCE
NOAA, NATIONAL WEATHER SERVICE

HSA OFFICE:
NWS Northern Indiana (IWX)

REPORT FOR (MONTH &YEAR):
February, 2006

MONTHLY REPORT OF RIVER AND FLOOD CONDITIONS

DATE:
March 13, 2006

TO: HYDROMETEOROLOGICAL INFO CENTER (W/OS31)
SSMC 2 – Rm. 13468
1325 EAST – WEST Highway
SILVER SPRING, MD 20910 –3283

SIGNATURE:
Michael Sabones, MIC
Greg Lamberty, Service Hydrologist

When no flooding occurs include miscellaneous river conditions such as significant rises, record low stages, ice conditions, snow cover, droughts, and hydrologic products issued (NWS Directive 10-924).

☐ An **X** inside this box indicates that no flooding occurred within this Hydrologic Service Area.

General Overview: February 2006 was warmer and drier than normal across Northern Indiana, Northwest Ohio, and Extreme Southern Lower Michigan. Precipitation averaged 0.67 inches below normal. Temperatures averaged 2.0 ^{o}F above normal. (Only NWS Fort Wayne and South Bend data were used).

For the month of February 2006, the average high temperature was in the upper 30s, the average low temperature was in the lower 20s giving an average temperature in the upper 20s. (Only NWS Fort Wayne and South Bend data were used).

There were two significant precipitation events that occurred in the Western Lower Great Lakes Region in February 2006.

The first one was a long duration precipitation event with the majority of the precipitation being rain. The precipitation occurred from February 2nd through February 6th. Around 0.60 inches of precipitation fell across the area (COOP Data Only). The precipitation began as rain with high temperatures well into the 40s and ended as snow on the 6th as high temperatures fell into the lower 30s. Snowfall amounts were light with an average of just around an inch (COOP Data Only). This event led to renewed rises on rivers and streams in Northwest Ohio and Northeast Indiana. The Tiffin River was flooding as February 2006 began and crested on the 1st at 11.18 feet. Flood stage is 11 feet. The river began a slow recession and fell below flood stage by the 2nd. However with precipitation from this event, the river again rose above flood stage by the 5th. A Flood Warning (FLW) was issued to cover the flooding. The Tiffin crested at only 11.16 feet on the 6th. Rivers in Northeast Indiana and Northwest Ohio rose strongly, however with the exception of the Tiffin River, crested well below flood stage. Rivers in Northwest Indiana and Southwest Lower Michigan had little response to the precipitation.

The second event was, again mostly rain and it occurred from February 15th through the 18th. An average of around one inch of precipitation fell in this event (COOP Data

Only). Rivers in Northeast Indiana and Northwest Ohio were, again responded best to the precipitation. With ten days to recede, the river response began from a much lower level. All rivers but the Tiffin remained below flood stage. A Flood Warning (FLW) and a Flood Watch (FFA) were issued for locations on the St. Joseph River (Ohio) and a Flood Warning (FLW) was issued for the Tiffin River. As before, the Tiffin River was the only one to rise above flood stage. This time, the Tiffin crested almost a foot above the 11 foot flood stage at Stryker Ohio. Rivers and streams elsewhere in the Western Lower Great Lakes also responded, however their response was significantly less than that in Northeast Indiana and Northwest Ohio.

The event ended as snow, but totals were light averaging between a half and one inch. The snowfall in both events had little effect on rivers and streams.

Soil Moisture and River Levels: Soil moisture levels continued a slow improvement across the Western Lower Great Lakes region in February 2006, but moisture levels in Northwest and North Central Indiana began to fall. Precipitation was well below normal at South Bend Indiana and slightly below normal at Fort Wayne. Moderate Drought as measured by the Palmer Drought Severity Index continued to be restricted to Northwest Indiana. Other areas continued to improve. The numbers calculated for data through February 25, 2006 are as follows: Northwest Indiana (-2.03, Moderate Drought), North-Central Indiana (-0.43, Normal), Northeast Indiana (+0.72, Normal), Southwest Lower Michigan (+1.77, Moist Side of Normal), South-Central Lower Michigan (+2.18, Unusual Moist Spell), Southeast Lower Michigan (+3.07, Very Moist Spell) and Northwest Ohio (+1.74, Moist Side of Normal).

As of March 2, 2006, river flows in the far Northern Indiana have declined significantly in the northwest part of the state. Flows of the Tippecanoe, Kankakee and Yellow Rivers are in the 10 to 24 percentile range, with Ora on the Tippecanoe River reporting flow in the less than 10 percentile range. Other streams in North-Central and Northeast Indiana have flow levels in the 10 to 24 percentile range but about half of the streams are reporting flows in the 25 to 74 percentile range. Northwest Ohio river flows have also declined with the majority in the 24 to 75 percentile range. A few gauges report flows in the 10 to 24 percentile range. Extreme Southern Lower Michigan Rivers also are showing less flow with most gauges reporting flow in the 24 to 75 percentile range. Few gauges in Southwest Lower Michigan are reporting even less with flows in the 10 to 24 percentile range. River data was provided by the United States Geological Survey.

Temperature: At Fort Wayne, the average high temperature in February 2006 was 37.9 ^{o}F and the average low temperature was 21.8 ^{o}F. This gave an average temperature of 29.8 ^{o}F which was 2.5 ^{o}F above normal. At Fort Wayne, the warmest temperature reached in February 2006 was 58 ^{o}F on the 16th. The coldest temperature reached was 3 ^{o}F on the 19th. The record for the warmest low temperature for February 2nd was tied when the temperature only fell to 36 ^{o}F.

At South Bend, the average high temperature was 36.9 ^{o}F and the average low temperature was 20.6 ^{o}F giving an average temperature of 28.8 ^{o}F which was 1.5 ^{o}F above normal for

February. The warmest temperature occurred on February 16th (59 °F) which broke the record for the date and the coldest temperature occurred on the 19th (-1 °F). The record for the warmest low temperature for February 3rd was tied when the temperature fell only to 36 °F.

Precipitation: Precipitation was below normal at both South Bend and Fort Wayne in February 2006. At Fort Wayne, 1.64 inches of precipitation fell, 0.30 inches below normal. Snowfall totaled only 4.8 inches in February 2006, 2.8 inches below normal. At South Bend, 0.95 inches of precipitation fell, 1.03 inches below normal. Snowfall totaled only 5.9 inches, 9.6 inches below normal.

Weather: February 2006 over the Western Lower Great Lakes Region began with temperatures well above normal, a carryover from January 2006. Highs were in the lower 50s on the 1st, but a storm system and associated cold frontal boundary brought cooler and wet weather to the area beginning on the 2nd, lasting into the 6th. The flood threat is covered in the overview section. The precipitation ended as some snow late on the 5th and early on the 6th. Snowfall totals averaged just around one inch (COOP Data Only), but South Bend reported nearly 2 inches on the 5th. High temperatures fell from the lower 50s on the 1st through the 40s on the 2nd and 3rd to the lower 30s by the 5th as the first sub freezing high temperatures to affect the area since January 18th 2006.

High temperatures continued to fall reaching the upper 20s to around 30 by the 7th. From the 1st through the 7th, temperatures averaged 8.4 °F above normal. Some light snow fell across the area on the 8th and 9th with amounts, again light averaging a tenth of an inch (COOP Data Only). High temperatures hovered in the 30s from the 8th through the 13th. Another bout of snow crossed the region from the 10th into the 13th. Cooperative weather observers reported an average amount of around 0.7 inches. However others reported heavier snowfall with as much as 5 inches reported in Jay County in Northeast Indiana. Other areas in Northern Indiana and Northwest Ohio as well as Extreme Southern Lower Michigan reported amounts between 0.5 and 3 inches. This snow fell on 11th and the 12th.

With high temperatures still going above freezing for several of the days from the 8th through the 13th, much of the snow melted. Temperatures averaged less than a degree °F below normal across the area.

High temperatures rose dramatically on the 14th reaching the upper 40s to the lower 50s across the area. As a result, any remaining snow melted quickly as warm air overspread the region. Another storm approached the area from the west and continued to pump up warm air. High temperatures then rose into the 50s by the 16th. With the warm air advance, rain began spreading across the region by the evening of the 15th and continued through the morning of the 17th producing an average of around one inch of rainfall across the area (COOP Data Only). A couple stations reported over one inch with Irene Byron near Fort Wayne reporting 1.26 inches. Rivers responded quickly and flooding occurred on the Tiffin River. The flooding is covered in more detail in the overview section. From the 14th through the 16th, temperatures averaged 14.9 °F above normal.

The storm finally moved east of the area on the 17th allowing cold artic air to flow across the Western Lower Great Lakes Region. The precipitation ended as snow, but only an average of a tenth of an inch of snow fell in the wake of the heavy rain (COOP Data Only). Little precipitation fell for the rest of the month. The coldest air of the month flowed across the area on the 18th and 19th. High temperatures plunged into the teens and lower 20s. Lows fell below zero on the 19th at South Bend and into the low single digits at Fort Wayne. From the 17th through the 20th, temperatures averaged 10.7 ^{o}F below normal.

The cold air slowly moderated as Canadian high pressure moved east. Warm air returned on the 21st as high temperatures rebounded into the upper 30s, reaching the mid to upper 40s by the 23rd. High temperatures remained in the 40s until the 26th as another shot of cold air pushed across the area behind a cold front. The front was dry though. High temperatures fell back into the lower 30s. The cold snap lasted only one day as warmer air quickly returned driving high temperatures back into the upper 30s and lower 40s by the 28th. From the 21st through the 28th, temperatures averaged 1.0 ^{o}F above normal.

For February 2006, Daily River and Lake Summaries (RVDs) and the Daily Hydrologic Summaries (RVAs) were issued as usual to disseminate river and precipitation information and daily and updated river forecasts. Three Hydrologic Outlooks (ESFs) were issued to disseminate probabilistic forecast numbers associated with the Advanced Hydrologic Prediction Service (AHPS) for the Maumee, St. Joseph (Michigan), the Kankakee and the Upper Wabash River Basins. Twenty-One Hydrologic Statements (RVSs) were issued to disseminate river forecasts. Three Flood Warnings (FLWs) were issued to cover the flood threat along rivers in Northeast Indiana and Northwest Ohio. Fourteen Flood Statements (FLSs) were issued to cover river flood threats in Northeast Indiana and Northwest Ohio. Four Flood Watches (FFAs) were issued to cover flood threats in Northwest Ohio. No Flash Flood Warnings (FFW), Flash Flood Statements (FFSs), Areal Flood Statements (FLSs) or Areal Flood Warnings (FLWs) were issued in February 2006.

Only lowland flooding occurred along the Tiffin River with no damage reported.

All temperature data used is from NWS Fort Wayne and South Bend data only. All precipitation data used are from COOP Weather Observers and from NWS Fort Wayne and South Bend.

NWS FORM E-5 U.S. DEPARTMENT OF COMMERCE
NOAA, NATIONAL WEATHER SERVICE

HSA OFFICE:
NWS Northern Indiana (IWX)

REPORT FOR (MONTH &YEAR):
March, 2006

MONTHLY REPORT OF RIVER AND FLOOD CONDITIONS

DATE:
April 13, 2006

TO: HYDROMETEOROLOGICAL INFO CENTER (W/OS31)
SSMC 2 – Rm. 13468
1325 EAST – WEST Highway
SILVER SPRING, MD 20910 –3283

SIGNATURE:
Michael Sabones, MIC
Greg Lamberty, Service Hydrologist

When no flooding occurs include miscellaneous river conditions such as significant rises, record low stages, ice conditions, snow cover, droughts, and hydrologic products issued (NWS Directive 10-924).

☐ An **X** inside this box indicates that no flooding occurred within this Hydrologic Service Area.

General Overview: March 2006 was slightly warmer and drier than normal across Northern Indiana, Northwest Ohio, and Extreme Southern Lower Michigan. Precipitation averaged 0.35 inches below normal. Temperatures averaged 0.3 ^{o}F above normal. (Only NWS Fort Wayne and South Bend data were used).

For the month of March 2006, the average high temperature was in the upper 40s, the average low temperature was around 30 ^{o}F giving an average temperature in the upper 30s. (Only NWS Fort Wayne and South Bend data were used).

There were two significant precipitation events in March 2006.

The first one occurred from March 8th through March 10th when an average of around three quarters of an inch of rain fell across the entire area (COOP Data). This rainfall caused significant rises on the rivers and streams but all stayed below flood stage.

The second and the most significant precipitation event occurred from March 11th through March 14th when an average of around 1.10 inches of rain fell across the area (COOP Data). This event ended with some light snowfall averaging around a tenth of an inch (COOP Data). This event led to flooding across parts of Northern Indiana and Northwest Ohio with the Tiffin and St. Joseph Ohio Rivers in Northwest Ohio and Northeast Indiana and the Kankakee and St. Joseph River Michigan in North-Central and Northwest Indiana flooding. The flooding was minor along these rivers and streams. The most dangerous flooding occurred in the short term and it occurred across parts of Northern Indiana and Northwest Ohio. Baugo Creek in Northern Indiana came out of its banks and flooded a bridge trapping a motorist. The motorist was rescued by the Elkhart County Highway Department (Reported by WSBT TV). Twelve to eighteen inches of water was flowing across a road in Marshall County in North-Central Indiana. The Fish and Bean Creeks also came out of their banks in response to the heavy rainfall. The heaviest rainfall occurred north of a line from Monticello Indiana to Napoleon Ohio and these areas suffered

the flooding. The river flooding was covered with Flood Warnings (FLWs) and Flood Statements (FLSs). Flood Statements (FLSs) were also issued to cover the short term flooding.

Soil Moisture and River Levels: Dry weather over the last 2 weeks of March combined with the beginnings of plant growth dried soils somewhat across the Western Lower Great Lakes region in March 2006, However all areas as measured by the Palmer Drought Severity Index showed soli moisture in the normal or very moist categories with the driest area continuing to be Northwest Indiana. The numbers calculated for data through April 1, 2006 are as follows: Northwest Indiana (-0.87, Normal), North-Central Indiana (+0.50, Normal), Northeast Indiana (+0.54, Normal), Southwest Lower Michigan (+1.74, Moist Side of Normal), South-Central Lower Michigan (+2.00, Unusual Moist Spell), Southeast Lower Michigan (+2.68 Unusual Moist Spell) and Northwest Ohio (+0.99, Normal).

As of April 4, 2006 river flows for most of Northern Indiana were in the 25 to 74 percentile range with gauges in the Upper Wabash River Basin in Northeast Indiana in the 75 to 89 percentile range. The St. Marys River at Decatur reported greater than 90 percentile flow. One gauge in Northwest Indiana was considerably drier with flow in the less than 10 percentile range. Over Northwest Ohio, flows were evenly divided between the 25 to 74 percentile range in the upper Maumee River Basin and in the Blanchard River Basin and 75 to 89 percentile range along the Maumee and Auglaize River Basins. In Southern Lower Michigan, most flows were in the 25 to 74 percentile range. Flow in the Paw Paw River was in the 10 to 24 percentile range. Flow in the Dowagiac River was in the less than 10 percentile range. The data was provided by the United States Geological Survey.

Temperature: At Fort Wayne, the average high temperature in March 2006 was 47.5 ^{o}F and the average low temperature was 29.8 ^{o}F. This gave an average temperature of 38.6 ^{o}F which was 0.5 ^{o}F above normal. At Fort Wayne, the warmest temperature reached in March 2006 was 70 ^{o}F on the 31st. The coldest temperature reached was 17 ^{o}F on the 5th. The record for the warmest low temperature for March 9th was broken when the temperature only fell to 51 ^{o}F.

At South Bend, the average high temperature was 46.0 ^{o}F and the average low temperature was 29.3 ^{o}F giving an average temperature of 37.6 ^{o}F which was 0.1 ^{o}F above normal for March. The warmest temperature occurred on March 31st (72 ^{o}F) and the coldest temperature occurred on the 4th and the 7th (15 ^{o}F). The record for the warmest low temperature for March 9th was broken when the temperature fell only to 51 ^{o}F.

Precipitation: Precipitation was below normal at Fort Wayne and above normal at South Bend in March 2006. At Fort Wayne, 1.98 inches of precipitation fell, 0.88 inches below normal. Snowfall totaled only 2.2 inches in March 2006, 2.5 inches below normal. At South Bend, 3.08 inches of precipitation fell, 0.19 inches above normal. Snowfall totaled only 3.6 inches, 5.1 inches below normal.

Weather: March 2006 started out with high temperatures in the lower 40s and dry. Colder

weather then moved into the area dropping high temperatures into the low to mid 30s by the 3rd. High temperatures rose into the lower 40s across the eastern part of the area on the 4th and 5th but remained in the 30s over the west. An area of snow crossed the Western Lower Great Lakes region from the 5th through the 8th dropping an average of just over one inch of snow (COOP Data). However, South Bend reported around 3.5 inches on the 5th and 6th. With high temperatures still topping out above freezing, much of the snow melted. Liquid amounts averaged just under 0.15 inches (COOP Data).

A last cold air mass then moved across the area on the 6th dropping high temperatures back into the 30s across the entire area. This was the final cold air mass of this cycle. Temperatures averaged 2.1 °F below normal from the 1st through the 7th.

From the 7th through the 13th, high temperatures rose through the 50s into the upper 60s by the 13th. Upper level flow shifted to the southwest bringing warm and moist air to the region. Several impulses crossed the area triggering showers and thunderstorms. An average of nearly 1.9 inches of rain fell from the 8th through the 13th (COOP Data) triggering flooding along the several rivers and streams in Northern Indiana and Northwest Ohio. The most precipitation fell on the 12th and 13th. More flood details are covered in the overview section. From the 8th through the 13th, temperatures averaged 14.5 °F above normal.

The weather patterned again shifted allowing cold air to return to the region. High temperatures fell back into the lower 40s on the 14th. Cold air remained in place through 27th with light snow occurring on the 16th through the 18th and on the 24th through the 26th. High temperatures remained in the lower 40s across the east and the upper 30s across the west. Temperatures averaged 5.9 °F below normal from the 14th through the 27th. Amounts with the two events were 0.7 and 0.3 inches of snow and around a tenth liquid and less than 0.05 inches liquid amounts respectively (COOP Data).

Warmer air then moved north across the Western Lower Great Lakes on the 27th pushing high temperatures into the lower 50s across the area. There was a brief respite with highs only reaching the mid 40s on the 28th before soaring into the lower 70s by the 31st. Two more bouts of precipitation occurred with the first one from the 27th through the 29th and the second one from the 30th through April 1st. Precipitation with both of these systems was light with only around a tenth of an inch with the first and around a third of an inch with the second event (COOP Data). Temperatures averaged 7.1 °F above normal from the 28th through the 31st.

For March 2006, Daily River and Lake Summaries (RVDs) and the Daily Hydrologic Summaries (RVAs) were issued as usual to disseminate river and precipitation information and daily and updated river forecasts. Five Hydrologic Outlooks (ESFs) were issued to disseminate probabilistic forecast numbers associated with the Advanced Hydrologic Prediction Service (AHPS) for the Maumee, St. Joseph (Michigan), the Kankakee and the Upper Wabash River Basins. Five more Hydrologic Outlooks were issued to cover the flood threat from March 8th through March 11th. Twenty-Five Hydrologic Statements (RVSs) were issued to disseminate river forecasts. Six Flood Warnings (FLWs) were

issued to cover flood threats along rivers in Northern Indiana, Northwest Ohio and Southern Lower Michigan. Twenty-Six Flood Statements (FLSs) were issued to cover river flooding. Three Flood Statements were also issued to cover areal flood threats in Northern Indiana and Northwest Ohio. Two Flood Watches (FFAs) were issued to cover a flood threat along the Kankakee River in Northwest Indiana. No Flash Flood Warnings (FFW), Flash Flood Statements (FFSs) or Areal Flood Warnings (FLWs) were issued in March 2006.

All temperature data used is from NWS Fort Wayne and South Bend data only. All precipitation data used are from COOP Weather Observers and from NWS Fort Wayne and South Bend.

NWS FORM E-5 U.S. DEPARTMENT OF COMMERCE
NOAA, NATIONAL WEATHER SERVICE

HSA OFFICE:
NWS Northern Indiana (IWX)

REPORT FOR (MONTH &YEAR):
April, 2006

MONTHLY REPORT OF RIVER AND FLOOD CONDITIONS

DATE:
May 3, 2006

TO: HYDROMETEOROLOGICAL INFO CENTER (W/OS31)
SSMC 2 – Rm. 13468
1325 EAST – WEST Highway
SILVER SPRING, MD 20910 –3283

SIGNATURE:
Michael Sabones, MIC
Greg Lamberty, Service Hydrologist

When no flooding occurs include miscellaneous river conditions such as significant rises, record low stages, ice conditions, snow cover, droughts, and hydrologic products issued (NWS Directive 10-924).

☐ An **X** inside this box indicates that no flooding occurred within this Hydrologic Service Area.

General Overview: April 2006 was warmer and wetter than normal across Northern Indiana, Northwest Ohio, and Extreme Southern Lower Michigan. Precipitation averaged 0.49 inches above normal. Temperatures averaged 4.0 ^{o}F above normal. (Only NWS Fort Wayne and South Bend data were used).

For the month of April 2006, the average high temperature was in the mid 60s, the average low temperature was around 40 ^{o}F giving an average temperature in the lower 50s. (Only NWS Fort Wayne and South Bend data were used).

There was only one significant precipitation event in April 2006.

That event covered one week extending from April 11th and ended on April 18th. An average of 1.60 inches of rain fell across the area (COOP Data). The heaviest rain fell on the 16th and 17th when an average of around 0.80 inches fell across the area. Several reports of amounts greater than one inch were reported over parts of Northeast, North-Central and Northeast Indiana. Rochester, Indiana reported 1.95 inches from the 16th through the morning of the 17th (COOP Data).

Area rivers and streams rose in response to the rainfall, especially after that which occurred on the 16th and 17th. The response would have been much greater if all of the rain that fell during that week fell in one day. Heavy rains caused minor flooding along the Wabash River at Wabash Indiana on the 17th. There was a threat of flooding along the St. Marys River at Decatur as well. A Flood Statement (FLS) and a Flood Warning (FLW) were issued for both points respectively. There was a threat of urban and small stream flooding in White County in Northwest Indiana and that was covered by an areal Flood Statement (FLS).

Soil Moisture and River Levels: Even though a majority of days in April has measurable precipitation, soil moisture began decreasing. Vegetation began growing rapidly as

abnormally warm April temperatures encouraged growth. The plant growth began depleting the soil moisture stored. This is reflected across the entire area as measured by the Palmer Drought Severity Index. The numbers are as follows: Northwest Indiana (-1.01, Dry Side of Normal), North-Central Indiana (-0.41, Normal), Northeast Indiana (-0.95, Normal), Southwest Lower Michigan (+0.01, Normal), South-Central Lower Michigan (+0.35, Normal), Southeast Lower Michigan (+1.38 Moist Side of Normal) and Northwest Ohio (-1.07, Dry Side of Normal).

As of May 2, 2006 flows in rivers in Northern Indiana covered a wide range from record low flow for the date for points along the St. Joseph River, the North Branch of the Elkhart and the Pigeon River to the 75 to 90 percentile range for Huntington along the Little River. Most areas were dry with flows ranging from the less than 10 percentile range to the 10 to 24 percentile range. These gauges were located in the Kankakee, St. Joseph and the northern part of the Maumee River Basins. The better flowing rivers with flows in the 25 to 74 percentile range were in the Upper Wabash River Basin. In Southwest Lower Michigan flows were in the record low range for the Dowagaic and Paw Paw Rivers and in the less than 10 percentile range for the St. Joseph River. Northwest Ohio Rivers were also dry with reported flows in the 10 to 24 percentile range.

Temperature: At Fort Wayne, the average high temperature in April 2006 was 65.4 ^{o}F and the average low temperature was 40.8 ^{o}F. This gave an average temperature of 53.1 ^{o}F which was 4.1 ^{o}F above normal. At Fort Wayne, the warmest temperature reached in April 2006 was 79 ^{o}F on the 13th. The coldest temperature reached was 27 ^{o}F on the 9th. The record for the lowest temperature for April 26th was broken when the temperature fell to 29 ^{o}F. April 2006 tied with 1991 for the 9th warmest on record.

At South Bend, the average high temperature was 63.9 ^{o}F and the average low temperature was 40.5 ^{o}F giving an average temperature of 52.2 ^{o}F which was 3.9 ^{o}F above normal for April. The warmest temperature occurred on April 14th (78 ^{o}F) and the coldest temperature occurred on the 9th (23 ^{o}F). April 2006 tied with 2005 and 1942 for the 8th warmest on record.

Precipitation: Precipitation was above normal at Fort Wayne and below normal at South Bend in April 2006. At Fort Wayne, 4.26 inches of precipitation fell, 0.72 inches above normal. Rainfall records for April 14th (1.37 inches) and for April 16th (1.21 inches) were broken in April 2006 at Fort Wayne. Only a trace of snow fell in April 2006. At South Bend, 2.41 inches of precipitation fell, 1.21 inches below normal. No snow fell in April 2006.

Weather: April 2006 began with high temperatures in the upper 40s to lower 50s. It was wet as well with an average of around a third of an inch of rain falling from March 31st through April 1st (COOP Data). Highs rose into the mid to upper 50s across the area on the 2nd. A second storm system passed across the area on the 2nd and 3rd causing showers and thunderstorms. Rainfall amounts averaged around a half of an inch (COOP Data). Rivers responded with significant rises but all remained below flood stage. The greatest rises were found in the Maumee and Upper Wabash River Basins in Northeast Indiana and Northwest

Ohio. Rises elsewhere were not as significant. Temperatures for the first 2 days of April averaged 4.0 ^{o}F above normal.

Somewhat cooler air spilled over the area from the northwest on the 3rd as the storm system which produced the rain left the area. High temperatures fell into the lower 50s on the 4th before beginning a slow rise into the lower 60s by the 6th as another storm system passed across the Western Lower Great Lake region. This system was much weaker and produced an average of under two tenths of an inch of rain (COOP Data) with little response from the river system. On the 7th high temperatures reached the mid 70s over Northeast Indiana while remaining in the upper 50s west. This storm system was the final one in a series which allowed cool air to move into the area. High temperatures fell back into the mid to upper 40s by the 8th. This was the coldest high temperatures would be for April 2006. High temperatures then began a slow rebound reaching the 50s by the 9th. From the 3rd through the 9th of April, temperatures averaged 0.8 ^{o}F below normal.

Much warmer weather then began invading the Western Lower Great Lakes region from the south on the 10th as high temperatures returned to 60s. High temperatures continued their rise reaching the lower to mid 70s by the 11th. Highs in the 70s then continued across the area through April 15th with the warmest days of the month being the 13th and 14th as high temperatures reached the upper 70s. Several storm systems crossed the area from the 11th through the 18th bringing the most significant rains of the month to the area. An average of 1.60 inches of rain fell during this time (COOP Data) over that week. A strong cold front moved through the area on the 15th and 16th leading to heaviest rainfall of that week with an average of around 0.80 inches (COOP Data) falling on the 16th and 17th. This rain event resulted in minor flooding along the Wabash River near Wabash and a minor flood threat for White County in Northwest Indiana. High temperatures fell back into the mid to upper 60s on the 16th. High temperatures remained in the 60s from the 16th through 18th as cooler air spilled across the Western Lower Great Lakes.

Warm air returned to the region by the 19th as high temperatures rose back into the 70s. This warmth continued through 22nd as cooler air behind a dry cold front dropped high temperatures back into the upper 60s, still above normal for this time of year. From the 10th through the 24th, temperatures averaged 9.5 ^{o}F above normal.

A strong cold front then crossed the area from the northwest late on the 24th driving much colder air into the area dropping high temperatures into the lower 50s on the 25th. This front was accompanied by light rain with amounts averaging around two tenths of an inch (COOP Data). High temperatures then struggled back into the lower 60s on the 26th reaching the upper 60s to the lower 70s on the 27th. This warm spell was also short lived as an upper low pressure system approached the area bringing more rain to the area with an average of around 0.60 inches (COOP Data). The wet weather continued into May 1st. The rivers and streams reacted little to the rains that fell on the 25th and 26th and again on the 29th through May 1st. Temperatures averaged 2.4 ^{o}F below normal from the 25th through the end of April.

For April 2006, Daily River and Lake Summaries (RVDs) and the Daily Hydrologic Summaries (RVAs) were issued as usual to disseminate river and precipitation information

and daily and updated river forecasts. Three Hydrologic Outlooks (ESFs) were issued to disseminate probabilistic forecast numbers associated with the Advanced Hydrologic Prediction Service (AHPS) for the Maumee, St. Joseph (Michigan), the Kankakee and the Upper Wabash River Basins. Ten Hydrologic Statements (RVSs) were issued to disseminate river forecasts. One Flood Warning (FLW) was issued to cover flood threats along the St. Marys Rivers in Northeast and Northwest Ohio. Three Flood Statements (FLSs) were issued to cover river flooding. One Flood Statement was also issued to cover an areal flood threat to White County in Northern Indiana. No Flood Watches (FFAs), Flash Flood Warnings (FFW), Flash Flood Statements (FFSs) or Areal Flood Warnings (FLWs) were issued in April 2006.

All temperature data used is from NWS Fort Wayne and South Bend data only. All precipitation data used are from COOP Weather Observers and from NWS Fort Wayne and South Bend.

NWS FORM E-5 U.S. DEPARTMENT OF COMMERCE
NOAA, NATIONAL WEATHER SERVICE

HSA OFFICE:
NWS Northern Indiana (IWX)

REPORT FOR (MONTH &YEAR):
May, 2006

MONTHLY REPORT OF RIVER AND FLOOD CONDITIONS

DATE:
June 8, 2006

TO: HYDROMETEOROLOGICAL INFO CENTER (W/OS31)
SSMC 2 – Rm. 13468
1325 EAST – WEST Highway
SILVER SPRING, MD 20910 –3283

SIGNATURE:
Michael Sabones, MIC
Greg Lamberty, Service Hydrologist

When no flooding occurs include miscellaneous river conditions such as significant rises, record low stages, ice conditions, snow cover, droughts, and hydrologic products issued (NWS Directive 10-924).

☐ An **X** inside this box indicates that no flooding occurred within this Hydrologic Service Area.

General Overview: May 2006 was cooler and wetter than normal across Northern Indiana, Northwest Ohio, and Extreme Southern Lower Michigan. Precipitation averaged 1.65 inches above normal. Temperatures averaged 1.7 ^{o}F below normal. (Only NWS Fort Wayne and South Bend data were used).

For the month of May 2006, the average high temperature was in the upper 60s, the average low temperature was in the upper 40s giving an average temperature in the upper 50s. (Only NWS Fort Wayne and South Bend data were used).

There were only two significant precipitation events in May 2006.

The first event began on May 1st and ended on the 3rd. An average of 1.12 inches of rain fell across the area (COOP Data). River levels rose a little, but all remained well below flood stage during this event. Also there was no short term flooding with this event.

The second event began on May 10th and ended on May 19th. An average of 3.35 inches of rain fell across the area (COOP Data). The heaviest rain fell on the 10th and 11th when an average of 1.34 inches fell across the area (COOP Data). Several stations reported amounts of 2 inches or more. Examples included Angola (2.11 inches), Bluffton (2.07 inches), Columbia City (2.10 inches) and Three Rivers Michigan (2.13 inches). This rainfall led to flooding along the St. Joseph River Ohio in Northeast Indiana and Northwest Ohio and the Tiffin River in Northwest Ohio. All of the river flooding was minor in nature with lowland flooding the most significant flooding. Flood Warnings (FLWs) and Flood Statements (FLSs) were issued to cover the river flooding. Several Flood Statements (FLSs) were also issued to cover areal and small streams flood threats in parts of Northern Indiana.

Other lesser flood threats occurred on May 25th and May 30th and 31st in response to less widespread rainfall. Flood Statements (FLSs) were issued for small areas in Extreme South - Central Lower Michigan and North - Central Indiana in response to this rainfall.

Soil Moisture and River Levels: With above normal precipitation in May, soil moisture began to slowly improve. Vegetation growth mitigated a lot of the flood threats, especially with the heavy rains of mid May. The Palmer Drought Severity Index calculated May 27, 2006 reflects this. With the new plant growth, soil moisture did not increase as much as it would have in response to a heavy March rain. The numbers are as follows: Northwest Indiana (-0.61, Dry Side of Normal), North-Central Indiana (+0.53, Normal), Northeast Indiana (+0.78, Normal), Southwest Lower Michigan (+0.46, Normal), South-Central Lower Michigan (+1.45, Moist Side of Normal), Southeast Lower Michigan (+2.18, Unusual Moist Spell) and Northwest Ohio (+1.01, Moist Side of Normal).

As of June 7, 2006 riverflows in Northern Indiana were mostly in the 25 to 74 percentile range with only the Yellow River at Knox in the 10 to 24 percentile range and the St. Marys River near Fort Wayne in the greater than 90 percentile range. In Northwest Ohio flows were somewhat greater with about half the gauges reporting flows in the 75-89 percentile range. In Southern Michigan most gauges were in the 25 to 74 percentile range with the Paw Paw River at Riverside Michigan in the 10 to 24 percentile range and the Dowagaic River at Sumnerville in the less than 10 percentile range.

All river levels have receded significantly since the mid May rains. However there were significant rises on the Upper Wabash at both Bluffton and Linn Grove Indiana in response to early June rains. This will be covered more thoroughly in the June 2006 report.

Temperature: At Fort Wayne, the average high temperature in May 2006 was 69.0 ^{o}F and the average low temperature was 49.1 ^{o}F. This gave an average temperature of 59.0 ^{o}F which was 1.4 ^{o}F below normal. At Fort Wayne, the warmest temperature reached in May 2006 was 90 ^{o}F on the 28th, 29th and the 30th. The coldest temperature reached was 36 ^{o}F on the 22nd. The record for the lowest high temperature for May 12th was broken when the temperature only rose to 46 ^{o}F.

At South Bend, the average high temperature was 68.0 ^{o}F and the average low temperature was 47.3 ^{o}F giving an average temperature of 57.6 ^{o}F which was 2.0 ^{o}F below normal for May. The warmest temperature occurred on the 28th, 29th and the 30th (91 ^{o}F) and the coldest temperature occurred on the 22nd (33 ^{o}F). The record for the lowest high temperature for May 12th was broken when the temperature only reached 43 ^{o}F.

Precipitation: Precipitation was above normal at both Fort Wayne and South Bend in May 2006. At Fort Wayne, 5.04 inches of precipitation fell, 1.29 inches above normal. At South Bend, 5.45 inches of precipitation fell, 1.95 inches above normal. No snow fell in May 2006.

Weather: May 2006 began with high temperatures in the lower 60s. It was wet as well with an average of around 1.1 inches of rain falling from May 1st through May 3rd (COOP Data). Highs rose into the mid 70s across the area by the 3rd. A cold front finally passed through the area on the 3rd and the 4th dropping high temperatures back into a range from the upper 60s east to the upper 50s west on the 5th. From the 1st through the 5th,

temperatures averaged 2.4 ^{o}F above normal.

A major change in the weather pattern caused the polar front to set up across the Lower Great Lakes region. A series of disturbances would travel along the front bringing rainfall. Warm air would try to re-establish itself before the next surge of cold would overspread the area. High temperatures remained in the lower 60s on the 6th and rose back into the mid 70s by the 9th. Then the first in the series of storm systems began approaching the area on the 10th bring a period of very heavy rain to the Western Lower Great Lakes region with several stations reporting amounts exceeding 2 inches. This event is covered in more detail in the overview section of this report. More disturbances followed the initial one bringing repeated rains to the area. The repeat rains caused flooding along the Tiffin and St. Joseph Rivers in Northwest Ohio and Northeast Indiana. High temperatures fell into the 50s on the 11th and into the 40s on the 12th. Records were set at both Fort Wayne and South Bend for coolest high temperatures on record for the 12th. High temperatures were in the 50s from the 13th through the 15th before rising back into the 70s by the 17th. Another weather disturbance produced more rainfall and another cold air mass followed that storm system into the area. High temperatures then dropped back into the 50s by the 18th.

This weather pattern began to weaken with each disturbance producing less rain and the cold outbreaks became weaker as well. High temperatures recovered to the 60s and remained there from the 20th through the 22nd. A major change in the weather pattern then took place allowing warm air masses dominate the weather in the area. High temperatures rebounded into the 70s by the 23rd and into the 80s by the 27th. From the 6th through the 24th, temperatures averaged 6.7 ^{o}F below normal. The storm system that heralded the change to warmer temperatures brought more rain as well. An average of around two thirds of an inch of rain fell across the area from the 24th through the 26th (COOP Data). The rain was heavy enough in Northwest Ohio to cause the issuance of flood statements (FLSs) for parts of that area.

With the weather pattern change, very warm air overspread the Western Lower Great Lakes region driving high temperatures into the lower 90s. The hot temperatures continued from the 28th through the 30th before another cold front moved through dropping high temperatures back into the 80s. This system brought an average of a quarter of an inch of rain to the region (COOP Data). Again there were some heavier showers which caused the issuance of flood statements (FLSs) for parts of Extreme South - Central Lower Michigan and North - Central Indiana. From the 25th through the 31st, temperatures averaged 9.5 ^{o}F above normal.

F**or May 2006**, Daily River and Lake Summaries (RVDs) and the Daily Hydrologic Summaries (RVAs) were issued as usual to disseminate river and precipitation information and daily and updated river forecasts. Three Hydrologic Outlooks (ESFs) were issued to disseminate probabilistic forecast numbers associated with the Advanced Hydrologic Prediction Service (AHPS) for the Maumee, St. Joseph (Michigan), the Kankakee and the Upper Wabash River Basins. Twenty-four Hydrologic Statements (RVSs) were issued to disseminate river forecasts. Three Flood Warnings (FLWs) were issued to cover flood threats along the St. Joseph River Ohio and the Tiffin Rivers in Northwest Ohio and

Northeast Indiana. Sixteen Flood Statements (FLSs) were issued to cover river flooding. Ten Flood Statements were also issued to cover an areal flood threats to a total of 16 counties in Northwest Ohio, Northern Indiana and Extreme South-Central Lower Michigan. Four Flood Watches (FFAs) were issued to cover the threat of river flooding along the St. Joseph River Ohio around Newville Indiana. No Flash Flood Warnings (FFW), Flash Flood Statements (FFSs) or Areal Flood Warnings (FLWs) were issued in May 2006.

All temperature data used is from NWS Fort Wayne and South Bend data only. All precipitation data used are from COOP Weather Observers and from NWS Fort Wayne and South Bend.

NWS FORM E-5 U.S. DEPARTMENT OF COMMERCE
NOAA, NATIONAL WEATHER SERVICE

HSA OFFICE:
NWS Northern Indiana (IWX)

REPORT FOR (MONTH &YEAR):
June, 2006

MONTHLY REPORT OF RIVER AND FLOOD CONDITIONS

DATE:
July 3, 2006

TO: HYDROMETEOROLOGICAL INFO CENTER (W/OS31)
SSMC 2 – Rm. 13468
1325 EAST – WEST Highway
SILVER SPRING, MD 20910 –3283

SIGNATURE:
Michael Sabones, MIC
Greg Lamberty, Service Hydrologist

When no flooding occurs include miscellaneous river conditions such as significant rises, record low stages, ice conditions, snow cover, droughts, and hydrologic products issued (NWS Directive 10-924).

☐ An **X** inside this box indicates that no flooding occurred within this Hydrologic Service Area.

General Overview: June 2006 was cooler and drier than normal across Northern Indiana, Northwest Ohio, and Extreme Southern Lower Michigan. Precipitation averaged 1.44 inches below normal. Temperatures averaged 1.1 ^{o}F below normal. (Only NWS Fort Wayne and South Bend data were used).

For the month of June 2006, the average high temperature was in the upper 70s, the average low temperature was in the upper 50s giving an average temperature in the upper 60s. (Only NWS Fort Wayne and South Bend data were used).

There was only one significant precipitation event in June 2006.

That event began on June 18th and ended on June 24th. An average of 1.19 inches of rain fell across the area (COOP Data). The rain fell over a 6 day period so no river flooding occurred with this event. However some spurts of heavy rain led to the issuance of Flood Statements (FLSs) on June 19th to cover short term flooding for locations in Northwest Ohio.

Soil Moisture and River Levels: With below normal precipitation in June, soil moisture began to deteriorate. This is reflected in the Palmer Drought Severity Index which was calculated on June 24, 2006. The numbers are as follows: Northwest Indiana (-2.09, Moderate Drought), North-Central Indiana (-1.27, Dry Side of Normal), Northeast Indiana (+0.46, Normal), Southwest Lower Michigan (-1.61, Dry Side of Normal), South-Central Lower Michigan (-0.15, Normal), Southeast Lower Michigan (+0.83, Normal) and Northwest Ohio (+0.44, Normal).

As of July 3, 2006, river flows were in the 25-74 percentile range across most of the area. Some rivers, however had flows in the less than 10 percentile range and these were the Yellow River at Knox in Northern Indiana, the Dowagaic River at Sumnerville and the Paw Paw River at Riverside in Southwest Lower Michigan. There were also a few locations

with flows in the 10-24 percentile range and they were the St. Joseph River at Elkhart and the Tippecanoe River at both Oswego and at Ora. One river had flow in the greater than 90 percentile range and it was the Little River near Huntington. The Bean Creek at Powers on Northwest Ohio had flows in the 75-89 percentile range. On the whole, rivers in the area have average flow for early July.

River levels did respond to each rainfall event, but only the Bean Creek at Powers Ohio and The Tiffin River at Stryker and the Wabash at Bluffton and at Linn Grove approaching flood stage in June. All rivers, however, crested below flood stage.

Temperature: At Fort Wayne, the average high temperature in June 2006 was 79.4 ^{o}F and the average low temperature was 58.1 ^{o}F. This gave an average temperature of 68.8 ^{o}F which was 0.9 ^{o}F below normal. At Fort Wayne, the warmest temperature reached in June 2006 was 89 ^{o}F on the 17th. The coldest temperature reached was 50 ^{o}F on the 5th and on the 12th.

At South Bend, the average high temperature was 78.7 ^{o}F and the average low temperature was 56.7 ^{o}F giving an average temperature of 67.7 ^{o}F which was 1.3 ^{o}F below normal for June. The warmest temperature occurred on the 17th (92 ^{o}F) and the coldest temperature occurred on the 12th and 13th (47 ^{o}F).

Precipitation: Precipitation was below normal at both Fort Wayne and South Bend in June 2006. At Fort Wayne, 3.36 inches of rain fell, 0.68 inches below normal. At South Bend, 2.00 inches of rain fell, 2.19 inches below normal.

Weather: June 2006 began with a cool spell which lasted until the 16th with temperatures averaging 2.4 ^{o}F below normal. Highs in June started in the mid to upper 70s with lows in the 60s. The 1st was dry but showers and thunderstorms crossed North-Central and Northeast Indiana, Northwest Ohio and South-Central Michigan. The showers and storms were caused by a warm front which passed to the north of the area by 5th. From the 2nd through the 4th rainfall totals averaged between 0.4 and 0.5 inches (COOP Data). No flooding occurred with this system. High temperatures rose into the low 80s by the 5th as the front passed north of the area. Another cold front then moved across the Western Lower Great Lakes Region on the 7th with more rain and thunderstorms. Rainfall totals averaged, again, around a half inch (COOP Data) on the 7th and 8th with no flooding occurring. High temperatures were pushed back into the 70s on the 7th.

Highs remained in the 70s through the 9th when a much stronger cold front crossed the area on the 10th with an average of nearly 0.6 inches (COOP Data). No flooding occurred with this event. High temperatures fell into the 60s across the area on the 10th. Temperatures rebounded slowly after that reaching the lower 70s by the 11th and remaining in the low to mid 70s range through the 13th. From the 1st through the 15th, temperatures averaged 2.4 ^{o}F below normal.

There was a shift in the weather pattern by the 15th allowing warmer air to advance northward. High temperatures reached the lower 80s by the 14th and advancing to the

upper 80s and lower 90s by the 16th with dry conditions. The dry weather prevailed into the 19th when a series of weather disturbances interacted with the warm air in place over the region leading several bouts of showers and some thunderstorms. With the wet weather, high temperatures oscillated in the 80 to 90 degree range through the 21st.

A stronger cold front then advanced on the area on the 21st, the causing more rainfall. The total rainfall from the 18th through the 24th averaged around 1.20 inches (COOP Data). The rains were spotty at times with some areas receiving significant rainfall, enough to trigger the issuance of Flood Statements for locations in Northwest Ohio on the 19th. High temperatures were driven down into the upper 70s to lower 80s range by the 24th. From the 16th through the 22nd, temperatures averaged 4.9 ^{o}F above normal.

The cold front had a difficult time advancing south, so it remained in the area allowing more bouts of showers and thunderstorms to cross the Western Lower Great Lakes Region. Rainfall amounts averaged between 0.4 and 0.5 inches from the 25th through the 29th. Again some of the amounts were quite heavy prompting the issuance of another Flood Statement for one county in Northern Indiana on the 25th. High temperatures remained in the upper 70s to lower 80s through the end of June. From the 23rd through the 30th, temperatures averaged 2.9 ^{o}F below normal.

F**or June 2006**, Daily River and Lake Summaries (RVDs) and the Daily Hydrologic Summaries (RVAs) were issued as usual to disseminate river and precipitation information and daily and updated river forecasts. Four Hydrologic Outlooks (ESFs) were issued to disseminate probabilistic forecast numbers associated with the Advanced Hydrologic Prediction Service (AHPS) for the Maumee, St. Joseph (Michigan), the Kankakee and the Upper Wabash River Basins and two Hydrologic Outlooks were issued for a flood threat along the Tiffin River. Thirteen Hydrologic Statements (RVSs) were issued to disseminate river forecasts. No Flood Warnings (FLWs) were issued for river or areal flooding. Three Flood Statements (FLSs) were issued to cover local flood threats over 4 counties in Northern Indiana and Northwest Ohio. No Flood Watches (FFAs), Flash Flood Warnings (FFW), or Flash Flood Statements (FFSs) were issued in June 2006.

All temperature data used is from NWS Fort Wayne and South Bend data only. All precipitation data used are from COOP Weather Observers and from NWS Fort Wayne and South Bend.

NWS FORM E-5 U.S. DEPARTMENT OF COMMERCE
NOAA, NATIONAL WEATHER SERVICE

HSA OFFICE:
NWS Northern Indiana (IWX)

REPORT FOR (MONTH &YEAR):
July, 2006

MONTHLY REPORT OF RIVER AND FLOOD CONDITIONS

DATE:
August 7, 2006

TO: HYDROMETEOROLOGICAL INFO CENTER (W/OS31)
SSMC 2 – Rm. 13468
1325 EAST – WEST Highway
SILVER SPRING, MD 20910 –3283

SIGNATURE:
Michael Sabones, MIC
Greg Lamberty, Service Hydrologist

When no flooding occurs include miscellaneous river conditions such as significant rises, record low stages, ice conditions, snow cover, droughts, and hydrologic products issued (NWS Directive 10-924).

☐ An **X** inside this box indicates that no flooding occurred within this Hydrologic Service Area.

General Overview: July 2006 was warmer and much wetter than normal across Northern Indiana, Northwest Ohio, and Extreme Southern Lower Michigan. Precipitation averaged 3.38 inches above normal. Temperatures averaged 1.7 ^{o}F above normal. South Bend set a record for the wettest July recorded. (Only NWS Fort Wayne and South Bend data were used).

For the month of July 2006, the average high temperature was in the mid 80s, the average low temperature was in the mid 60s giving an average temperature in the mid 70s. (Only NWS Fort Wayne and South Bend data were used).

There were two significant precipitation events in July 2006.

The first event began on July 11th and ended on July 13th. An average of 1.98 inches of rain fell across the area (COOP Data). Short term flooding occurred across a narrow band of North-Central and Northeast Indiana late on the 11th through the early morning on the 12th. The rainfall resulted from tropical convection in which the storms had little or no lightning associated with them. WCM Steve Eddy reported over 8.5 inches of rain with this system. Nearly 9 inches of rain was reported in the Oliver Lake area in Southern Lagrange County in Northern Indiana. The heavy rain caused significant flooding of numerous local, county and state roads in Elkhart County in North-Central Indiana. Numerous homes had their basements flooded and at least 3 businesses received some flooding. The cities of Goshen, Nappanee, and Millersburg were also affected by flooding. The Millersburg Waste Water Treatment Plant was flooded, causing the release of storm water and sewage into the nearby creek. Urban and Small Streams Flood Advisories (FLSs) were posted for parts of Elkhart, St. Joseph (IN), Lagrange, Noble and Dekalb Counties in Northern Indiana for the event. Effects from the extreme heavy rains were felt into the afternoon of the 12th when an areal Flood Warning (FLW) was posted for part of Elkhart, Dekalb, Lagrange, Noble and Steuben Counties in North-Central and Northeast Indiana. The rain that fell on these areas was almost twice the 100 year rain event for a 6 hour

rainfall.

Heavy rains also fell in Northwest Ohio prompting the issuance of Urban and Small Streams Flood Advisories (FLSs) for that area as well. These rains plus additional rains on the 14th caused the Tiffin River to go out of its banks on the 15th. A Flood Warning (FLW) was issued for this event.

The second event began on July 27th and ended on July 29th. An average of 1.60 inches (COOP Data) of rain fell across the area with the greatest amounts falling on Whitley and Allen Counties in Northeast Indiana where an isolated report of 5.5 inches in the Spy Run Creek Basin in Fort Wayne was received. This rain plus the nearly 4 inches that fell near the Spy Run Creek gauge resulted in a rapid rise of the creek levels to moderate flood. Basement flooding occurred in the Eastbrook - Westbrook Neighborhood in Fort Wayne through which the Spy Run Creek flows. The City of Fort Wayne commenced sandbagging the area and prevented worse flood damage in doing so. The creek rose from a base flow of 3.19 feet at around 8:30 pm EDT to a crest of 10.38 feet at around 7:15 am EDT. Flood Stage is 8 feet. Urban and Small Stream Flood Advisories (FLSs) were issued for both Whitley and Allen Counties in Northeast Indiana on the morning of the 27th.

A second round of heavy rain was expected in the evening so a Hydrologic Outlook (ESF) was issued to alert the public of the possibility of flooding. The outlook was later upgraded to a Flood Watch (FFA) for our southern half. The heavy rain then began falling across parts of Northern Indiana and Northwest Ohio later that afternoon prompting the issuance of Urban and Small Streams Flood Advisories (FLSs) for LaPorte, Cass, St. Joseph, White and Whitley Counties in Northern Indiana and for much of Northwest Ohio as well. The rains became more significant over LaPorte and White Counties prompting the issuance of Flash Flood Warnings. The only river that threatened to flood in this event was the Tiffin in Northwest Ohio. A Flood Warning (FLW) was issued on the evening of the 29th for the river. The Tiffin crested exactly at the 11 foot flood stage on the morning of the 30th.

Soil Moisture and River Levels: With above normal precipitation in July, soil moisture improved. This is reflected in the Palmer Drought Severity Index which was calculated on July 29, 2006. The numbers are as follows: Northwest Indiana (-0.32, Normal), North-Central Indiana (0.00, Normal), Northeast Indiana (+0.52, Normal), Southwest Lower Michigan (-0.68, Normal), South-Central Lower Michigan (-0.55, Normal), Southeast Lower Michigan (+0.31, Normal) and Northwest Ohio (-0.68, Normal).

As of August 7, 2006, Northern Indiana and Northwest Ohio had about half their rivers in the 25-75 percentile range and half in the 76-90 percentile range. Southern Michigan had most of their rivers in the 25-75 percentile range. The Elkhart River in Northern Indiana however had flows in the 76 to greater than 90 percentile range. This was due to the very heavy rains that fell in that river basin in mid July. On the dry side, the Dowagiac River at Sumnerville had flows in the less than 10 percentile range. Data provided by the United States Geological Survey (USGS).

Temperature: At Fort Wayne, the average high temperature in July 2006 was 84.7 ^{o}F and

the average low temperature was 65.4 ^{o}F. This gave an average temperature of 75.1 ^{o}F which was 1.7 ^{o}F above normal. At Fort Wayne, the warmest temperature reached in July 2006 was 93 ^{o}F on the 31st. The coldest temperature reached was 54 ^{o}F on the 6th.

At South Bend, the average high temperature was 83.6 ^{o}F and the average low temperature was 65.6 ^{o}F giving an average temperature of 74.6 ^{o}F which was 1.6 ^{o}F above normal for July. The warmest temperature occurred on the 31st (94 ^{o}F) and the coldest temperature occurred on the 5th (53 ^{o}F). The record for the warmest minimum temperature was broken at South Bend for the 31st when the temperature only fell to 74 ^{o}F.

Precipitation: Precipitation was well above normal at both Fort Wayne and South Bend in July 2006. At Fort Wayne, 5.41 inches of rain fell, 1.83 inches above normal. At South Bend, 8.66 inches of rain fell, a record for July, 4.93 inches above normal. The record for rainfall on the 28th was also broken when 2.51 inches fell.

Weather: July 2006 began with temperatures above normal across the area. High temperatures reached the lower 90s on the 1st. Then a cold front passed through dropping highs into the lower 80s by the 3rd. From the 1st through the 3rd, temperatures were 3.4 ^{o}F below normal. Showers and thunderstorms accompanied this system giving the region an average of around three quarters of an inch (COOP Data). No flooding occurred with this rainfall.

A period of cooler than normal temperatures followed with high temperatures reaching only the mid 70s by the 5th. Warmer air began to return to the Western Lower Great Lakes Region by the 6th pushing high temperatures back into the 80s across the region. From the 4th through the 11th, temperatures averaged 2.7 ^{o}F below normal.

The cold front never moved very far south of the area and a series of disturbances began moving along it causing bouts of showers and thunderstorms. The first system crossed the region on the 11th and lasted through the 13th with an average of nearly two inches of rain falling across the area (COOP Data). The flooding that followed is covered in the General Overview Section of this report. More rain fell on the 14th and 15th averaging around three quarters of an inch. This rain caused flooding along the Tiffin River and led to the issuance of a Flash Flood Warning for St. Joseph County in North-Central Indiana as well the issuance of Urban and Small Stream Flood Advisories for part of Northeast Indiana, Extreme South Central Lower Michigan and Northwest Ohio. Once these systems moved through, very warm and humid air began to dominate the area's weather. High temperatures reached the lower 90s on the 15th and 16th. A cold front then moved through dropping high temperatures back into the lower 80s by the 18th, producing around 0.4 inches of rain across the area (COOP Data). The rain was heavy enough in spots to cause the issuance of Urban and Small Streams Flood Advisories for parts of Northern Indiana. The cold front did not have a lot of cool air behind it in that high temperatures rebounded back into the upper 80s by the 19th. From the 12th through the 21st, temperatures averaged 3.6 ^{o}F above normal.

Another cold front then went through the area on the 19th and 20th dropping high

temperatures back into the mid 70s to the lower 80s range by the 23rd. This cold front had showers and thunderstorms associated with it producing an average of around a third of an inch of rain (COOP Data). From the 22nd through the 24th, temperatures averaged 2.9 °F below normal.

Warm air returned to dominate the weather through to the end of the month with temperatures averaging 5.7 °F above normal. By the 24th, high temperatures rose back into the mid 80s and then another system and cold front crossed the area producing bouts of showers and thunderstorms with very heavy rains occurring late on the 26th and on the 27th. An average of over 1.5 inches of rain fell from the 27th to the 29th (COOP Data). Flooding associated with this event is covered in the General Overview Section of this report. High temperatures fell back into low to mid 80s by the 27th. The precipitation ended by the 29th with temperatures rebounding to the low to mid 90s on the 31st which was the warmest day in this July.

F**or July 2006**, Daily River and Lake Summaries (RVDs) and the Daily Hydrologic Summaries (RVAs) were issued as usual to disseminate river and precipitation information and daily and updated river forecasts. Four Hydrologic Outlooks (ESFs) were issued to disseminate probabilistic forecast numbers associated with the Advanced Hydrologic Prediction Service (AHPS) for the Maumee, St. Joseph (Michigan), the Kankakee and the Upper Wabash River Basins and two Hydrologic Outlooks were issued for a flood threats across the area in association with the heavy rain events. Eighteen Hydrologic Statements (RVSs) were issued to disseminate river forecasts. Two Flood Warnings (FLWs) were issued for river flooding and one for areal flooding. Twenty-nine Flood Statements (FLSs) were issued to cover urban and small streams flooding local flood threats over 47 counties in Northern Indiana, Northwest Ohio and Extreme Southern Lower Michigan. Four Flood Statements (FLSs) were issued to cover river flooding. Three Flood Watches (FFAs) were issued to cover the flood threats on the 27th and 28th. Three Flash Flood Warnings (FFWs) were issued for flood threats on the 14th and on the 27th. Four Flash Flood Statements (FFSs) were issued to augment the Flash Flood Warnings.

All temperature data used is from NWS Fort Wayne and South Bend data only. All precipitation data used are from COOP Weather Observers and from NWS Fort Wayne and South Bend.

NWS FORM E-5 U.S. DEPARTMENT OF COMMERCE
NOAA, NATIONAL WEATHER SERVICE

HSA OFFICE:
NWS Northern Indiana (IWX)

REPORT FOR (MONTH &YEAR):
August, 2006

MONTHLY REPORT OF RIVER AND FLOOD CONDITIONS

DATE:
September 7, 2006

TO: HYDROMETEOROLOGICAL INFO CENTER (W/OS31)
SSMC 2 – Rm. 13468
1325 EAST – WEST Highway
SILVER SPRING, MD 20910 –3283

SIGNATURE:
Michael Sabones, MIC
Greg Lamberty, Service Hydrologist

When no flooding occurs include miscellaneous river conditions such as significant rises, record low stages, ice conditions, snow cover, droughts, and hydrologic products issued (NWS Directive 10-924).

☐ An **X** inside this box indicates that no flooding occurred within this Hydrologic Service Area.

General Overview: August 2006 was slightly warmer and wetter than normal across Northern Indiana, Northwest Ohio, and Extreme Southern Lower Michigan. Precipitation averaged 0.13 inches above normal. Temperatures averaged 0.4 ^{o}F above normal. (Only NWS Fort Wayne and South Bend data were used).

For the month of August 2006, the average high temperature was in the lower 80s, the average low temperature was in the lower 60s giving an average temperature in the lower 70s. (Only NWS Fort Wayne and South Bend data were used).

There were two significant precipitation events in August 2006.

The first event began on August 7th and ended on August 11th. An average of 0.85 inches of rain fell across the area (COOP Data). The only flood threat was urban and small streams type of flooding. Two Urban and Small Streams Flood Advisories were issued on the late evening of August 10th and early morning of August 11th to cover that flood threat.

The second event began on August 26th and ended on August 31st. An average of 2.58 inches (COOP Data) of rain fell across the area. Rivers responded, but all remained well below flood stage. However five Urban and Small Streams Flood Advisories were issued to cover flood threats in parts of Northern Indiana on the 28th of the month.

Soil Moisture and River Levels: Soil moisture continues to improve with timely August rains preventing any significant drought from even beginning across the Western Lower Great Lakes region. This is reflected in the Palmer Drought Severity Index which was calculated on September 2, 2006. The numbers are as follows: Northwest Indiana (+1.66, Moist Side of Normal), North-Central Indiana (+0.75, Normal), Northeast Indiana (+0.60, Normal), Southwest Lower Michigan (-0.04, Normal), South-Central Lower Michigan (-0.22, Normal), Southeast Lower Michigan (+0.38, Normal) and Northwest Ohio (+0.25, Normal).

As of September 7, 2006, Northern Indiana, Northwest Ohio and Southern Michigan had about half their rivers in the 25-75 percentile range and half in the 76-90 percentile range. Notable exceptions were the North Branch of the Elkhart River at Cosperville where the flow was greater than the 90th percentile and the Auglaize River at Fort Jennings Ohio where the flow was less than the 10th percentile. Data is provided by the United States Geological Survey (USGS).

Temperature: At Fort Wayne, the average high temperature in August 2006 was 81.4 °F and the average low temperature was 61.5 °F. This gave an average temperature of 71.5 °F which was 0.4 °F above normal. At Fort Wayne, the warmest temperature reached in August 2006 was 93 °F on the 2nd. The coldest temperature reached was 49 °F on the 16th. A record was set for the warmest low temperature on the 1st when the temperature only fell to 74 °F.

At South Bend, the average high temperature was 80.5 °F and the average low temperature was 62.2 °F giving an average temperature of 71.3 °F which was 0.3 °F above normal for August. The warmest temperature occurred on the 1st (93 °F) and the coldest temperature occurred on the 16th (52 °F). The record for the warmest low temperature was broken at South Bend for the 1st when the temperature only fell to 77 °F.

Precipitation: Precipitation was above normal at South Bend and below normal at Fort Wayne in August 2006. At Fort Wayne, 3.17 inches of rain fell, 0.43 inches below normal. At South Bend, 4.66 inches of rain fell, 0.68 inches above normal.

Weather: August 2006 began with temperatures well above normal across the area with highs in the lower 90s on the first two days of August with a very warm and moist air mass covering the area. On the 3rd, the first in a series of cold fronts worked its way across the Western Lower Great Lakes spreading scattered showers and thunderstorms. An average of around 0.60 inches of rain fell with no flooding occurring (COOP Data) through the 4th. High temperatures dropped into the upper 70s to lower 80s range by the 3rd. For the first two day of August, temperatures averaged 11.0 °F above normal. After the 2nd, temperatures never reached 90 °F again.

High temperatures rebounded on the 4th into the mid 80s, remaining in the low to mid 80s through the 9th before the next cold front approached. Scattered showers and thunderstorms developed in this air mass beginning on the 7th and lasted through the 11th with the heaviest and most widespread precipitation falling on the 10th and 11th as the cold front passed. Flooding with this event is covered in the overview section of this report. An average of around 0.90 inches of rain (COOP Data) fell during this time frame with most of it concentrated on the 10th and 11th. High temperatures fell into the upper 70s to around 80 °F range from the 9th through the 13th.

Temperatures tried to rebound but stopped at highs in the lower to middle 80s by the 13th when a third cold front approached from the northwest finally crossing the region on the 14th and 15th. Precipitation was quite light ahead of this system with an average of less

than a tenth of an inch falling (COOP Data). High temperatures were little changed remaining in the upper 70s to the lower 80s range. Slightly warmer air made its way back into the area by the 17th allowing high temperatures to reach the low to mid 80s. A forth cold front then passed through the Western Lower Great Lakes region by the 19th. Scattered showers and thunderstorms broke out ahead of this front beginning on the 17th with the event lasting into the 20th. An average of around a half inch of rain fell with the most of it falling on the 19th (COOP Data). No flooding occurred with this system. High temperatures fell into the upper 70s on 20th as Canadian high pressure built into the area. From the 3rd through the 21st, temperatures average just 0.9 °F below normal.

Warmer air made a more lasting return to the area on the 22nd with high temperatures moving back into the lower to middle 80s on both the 22nd and 23rd. Cooler air, however, was not far away with another cold front hanging just north and west of the area. Scattered showers and thunderstorms developed from the 23rd through the 25th with an average of around a third of an inch of rain occurring (COOP Data). No flooding occurred with this rainfall. There was little change in high temperatures with the front remaining in the area, but low temperatures were warmer dropping only into the 60s from the 24th through the 27th. Temperatures averaged 2.9 °F above normal from the 22nd through the 27th.

A more significant rain event started across the Western Lower Great Lakes region beginning on the 26th and lasted through the 31st. An average of 2.5 inches of rain occurred with the majority of rain falling on the 27th and again on the 29th (COOP Data). Flooding with this event is covered in the Overview Section of this report. The front slid south of the area during this time frame allowing the coolest air of the month into the area. High temperatures fell into the upper 60s by the 29th, rebounding only into the mid to upper 70s by the end of the month. From the 28th through the 31st, temperatures averaged 1.4 °F below normal.

F**or August 2006**, Daily River and Lake Summaries (RVDs) and the Daily Hydrologic Summaries (RVAs) were issued as usual to disseminate river and precipitation information and daily and updated river forecasts. Three Hydrologic Outlooks (ESFs) were issued to disseminate probabilistic forecast numbers associated with the Advanced Hydrologic Prediction Service (AHPS) for the Maumee, St. Joseph (Michigan), the Kankakee and the Upper Wabash River Basins and two Hydrologic Outlooks were issued for flood threats across the area in association with the heavy rain events. No Hydrologic Statements (RVSs) were issued to disseminate river forecasts. Seven Flood Statements (FLSs) were issued to cover urban and small stream flood threats over 14 counties in Northern Indiana and Northwest Ohio. No Flood Warnings (FLWs) for river or areal flooding, Flood Statements (FLSs), for river flooding, Flood Watches (FFAs), Flash Flood Warnings (FFWs) or Flash Flood Statements (FFSs) were issued in August, 2006.

All temperature data used is from NWS Fort Wayne and South Bend data only. All precipitation data used are from COOP Weather Observers and from NWS Fort Wayne and South Bend.

NWS FORM E-5 U.S. DEPARTMENT OF COMMERCE
NOAA, NATIONAL WEATHER SERVICE

HSA OFFICE:
NWS Northern Indiana (IWX)

REPORT FOR (MONTH &YEAR):
September, 2006

MONTHLY REPORT OF RIVER AND FLOOD CONDITIONS

DATE:
October 11, 2006

TO: HYDROMETEOROLOGICAL INFO CENTER (W/OS31)
SSMC 2 – Rm. 13468
1325 EAST – WEST Highway
SILVER SPRING, MD 20910 –3283

SIGNATURE:
Michael Sabones, MIC
Greg Lamberty, Service Hydrologist

When no flooding occurs include miscellaneous river conditions such as significant rises, record low stages, ice conditions, snow cover, droughts, and hydrologic products issued (NWS Directive 10-924).

☐ An **X** inside this box indicates that no flooding occurred within this Hydrologic Service Area.

General Overview: September 2006 was cooler and slightly drier than normal across Northern Indiana, Northwest Ohio, and Extreme Southern Lower Michigan. Precipitation averaged 0.15 inches below normal. Temperatures averaged 2.6 ^{o}F below normal. (Only NWS Fort Wayne and South Bend data were used).

For the month of September 2006, the average high temperature was in the lower 70s, the average low temperature was in the lower 50s giving an average temperature in the lower 60s. (Only NWS Fort Wayne and South Bend data were used).

There were two significant precipitation events in September 2006.

The first event began on September 11th and ended on September 14th. An average of 1.14 inches of rain fell across the area (COOP Data). One Flood Statement for localized urban and small streams type of flooding was issued for White County in Northwest Indiana on the evening of the 12th. There were rises on area rivers but all remained well below flood stage.

The second event began on September 17th and ended on September 19th. An average of 0.39 inches of rain fell across the area (COOP Data) . No flooding occurred across the area. Rivers responded with minor rises.

Flood Statements were issued on the 5th and the 9th for localized urban and small streams flooding for parts of 3 counties in Northern Indiana. The heavy rain was scattered and missed the COOP rain gauges. COOP average amounts totaled less than a tenth of an inch for both events.

Soil Moisture and River Levels: Soil moisture continued to increase across the entire area with Northwest Indiana and Southeast Lower Michigan in a moderate moist spell as indicated by the Palmer Drought Severity Index. The Palmer Drought Severity Index on

October 7, 2006 indicated as follows: Northwest Indiana (+2.23, Unusual Moist Spell), North-Central Indiana (+1.24, Moist Side of Normal), Northeast Indiana (+1.61, Moist Side of Normal), Southwest Lower Michigan (+1.99, Moist Side of Normal), South-Central Lower Michigan (+1.36, Moist Side of Normal), Southeast Lower Michigan (+2.19, Unusual Moist Spell) and Northwest Ohio (+1.21, Moist Side of Normal).

As of October 10, 2006, Northern Indiana, Northwest Ohio and Southern Michigan had flows were split between the 25-75 percentile range the 76-90 percentile range. A notable exception was the Bean Creek at Powers in Northwest Ohio where the flow was greater than the 90th percentile. Data is provided by the United States Geological Survey (USGS).

Temperature: At Fort Wayne, the average high temperature in September 2006 was 71.2 ^{o}F and the average low temperature was 50.8 ^{o}F. This gave an average temperature of 61.0 ^{o}F which was 3.1 ^{o}F below normal. At Fort Wayne, the warmest temperature reached in September 2006 was 83 ^{o}F on the 17th. The coldest temperature reached was 38 ^{o}F on the 21st.

At South Bend, the average high temperature was 70.3 ^{o}F and the average low temperature was 52.4 ^{o}F giving an average temperature of 61.4 ^{o}F which was 2.0 ^{o}F below normal for September. The warmest temperature occurred on the 17th (84 ^{o}F) and the coldest temperature occurred on the 21st (38 ^{o}F).

Precipitation: Precipitation was below normal at both South Bend and at Fort Wayne in September 2006. At Fort Wayne, 2.77 inches of rain fell, 0.04 inches below normal. At South Bend, 3.53 inches of rain fell, 0.26 inches below normal. The record for the most rainfall on September 12th at South Bend was broken when 1.31 inches fell.

Weather: September 2006 began with temperatures below normal. High temperatures on the 1st were in the lower to middle 70s and remained in that range through the 5th. Scattered rain showers occurred on the first 3 days as a cool Canadian high pressure moved across the region. The high finally moved east of the Western Lower Great Lakes on the 5th allowing a return of warmer air to the region with high temperatures reaching the lower 80s by the 8th. From the 1st through the 5th, temperatures averaged 3.1 ^{o}F below normal.

From the 5th through the 18th a somewhat warmer temperature regime dominated the Western Great Lakes region. Temperatures averaged just 0.5 ^{o}F above normal. There were several air mass changes during the period along with several bouts of rain. The heaviest rainfall occurred from the 11th through the 14th with South Bend receiving 1.31 inches on the 12th breaking the record for the date. From the 9th, high temperatures dropped from the lower 80s to the low to mid 60s on the 10th. Warmer air began to return on the 11th with high temperatures rising back into the upper 60s to lower 70s reaching the lower 70s across the entire area on the 12th A reinforcing cold air mass began approaching the area causing outbreaks of showers and thunderstorms on the 12th and 13th. An average of 1.14 inches of rain fell across the area from the 11th through the 14th (COOP Data). Flooding is covered in the overview section of this report. There was little temperature change with high temperatures continuing to range from the mid 60s to lower 70s on the 13th. High

temperatures rose back into the lower to mid 80s on the 17th as warmer air followed the cool air back into the region. A second cold front crossed the area from the west on the 17th causing another bout of showers. An average of just under 0.4 inches fell with this system (COOP Data) with no flood threat.

Much colder air moved into the area behind the cold front dropping high temperatures into the upper 50s by the 19th. The coldest temperatures of the month occurred on the morning of the 21st as low temperatures reached the upper 30s with scattered frost being reported across the area. High temperatures however rebounded into the upper 60s that afternoon. High temperatures reached the lower 70s by the 22nd. The warm up was short as a reinforcing shot of cold air behind a cold front brought another bout of rain to the area with an average of just over a third of an inch falling (COOP Data). Again, no flooding occurred with this rain. High temperatures again fell into the lower to mid 60s by the 24th.

The cold snap was short as high temperatures rose back into the lower 70s across the entire area on the 26th. A third cold front crossed the area on the 27th dropping high temperatures into the upper 60s across the northwest, however highs reached the upper 70s across the east before the cold front arrived. The cold front brought just a little over a tenth of an inch of rainfall to the region from the 27th and 28th (COOP Data). High temperatures were driven down in the mid 50s to lower 60s range by the 28th, but slowly recovered into the upper 50s to around the 60 degree range on the 29th. Warmer air again began to move into the region with highs reaching the mid 60s by the 30th as a warm front approached the area from the southwest. Rain showers spread across the area on the 30th and on the 1st of October bringing an average of around 0.30 inches of rain to the area (COOP Data) with no flooding. Temperatures averaged 4.9 ^{o}F below normal from the 19th through the 30th of September.

F**or September 2006**, Daily River and Lake Summaries (RVDs) and the Daily Hydrologic Summaries (RVAs) were issued as usual to disseminate river and precipitation information and daily and updated river forecasts. Four Hydrologic Outlooks (ESFs) were issued to disseminate probabilistic forecast numbers associated with the Advanced Hydrologic Prediction Service (AHPS) for the Maumee, St. Joseph (Michigan), the Kankakee and the Upper Wabash River Basins. No Hydrologic Statements (RVSs) were issued to disseminate river forecasts. Four Flood Statements (FLSs) were issued to cover urban and small stream flood threats over 6 counties in Northern Indiana. No Flood Warnings (FLWs) for river or areal flooding, Flood Statements (FLSs), for river flooding, Flood Watches (FFAs), Flash Flood Warnings (FFWs) or Flash Flood Statements (FFSs) were issued in September, 2006.

All temperature data used is from NWS Fort Wayne and South Bend data only. All precipitation data used are from COOP Weather Observers and from NWS Fort Wayne and South Bend.

NWS FORM E-5 U.S. DEPARTMENT OF COMMERCE
NOAA, NATIONAL WEATHER SERVICE

HSA OFFICE:
NWS Northern Indiana (IWX)

REPORT FOR (MONTH &YEAR):
October, 2006

MONTHLY REPORT OF RIVER AND FLOOD CONDITIONS

DATE:
November 7, 2006

TO: HYDROMETEOROLOGICAL INFO CENTER (W/OS31)
SSMC 2 – Rm. 13468
1325 EAST – WEST Highway
SILVER SPRING, MD 20910 –3283

SIGNATURE:
Michael Sabones, MIC
Greg Lamberty, Service Hydrologist

When no flooding occurs include miscellaneous river conditions such as significant rises, record low stages, ice conditions, snow cover, droughts, and hydrologic products issued (NWS Directive 10-924).

☐ An **X** inside this box indicates that no flooding occurred within this Hydrologic Service Area.

General Overview: October 2006 was cooler and wetter than normal across Northern Indiana, Northwest Ohio, and Extreme Southern Lower Michigan. Precipitation averaged 1.48 inches below normal. Temperatures averaged 3.3 ^{o}F below normal. (Only NWS Fort Wayne and South Bend data were used).

For the month of October 2006, the average high temperature was in the upper 50s, the average low temperature was in the upper 30s giving an average temperature in the upper 40s. (Only NWS Fort Wayne and South Bend data were used).

There were three significant precipitation events in October 2006.

The first event began on October 1st and ended on October 5th. An average of 1.34 inches of rain fell across the area (COOP Data). There were significant rises on some area rivers especially in Extreme Southwest Lower Michigan and Northwest Indiana. Lesser rises were noted elsewhere. However all rivers remained well below flood stage.

The second event began on October 16th and ended on October 20th. An average of 1.91 inches of rain fell across the area (COOP Data). Most of the rain fell on the 16th and 17th when an average of 1.68 inches of rain fell. The rises on rivers and streams were much more significant with this event. By the middle of the month, much of the vegetation was dead from a hard freeze which occurred from the 12th through the 15th. This increased the runoff efficiency of the ground. So when the rains began on the 16th, rivers and stream rose rapidly with many approaching flood stage. An Urban and Small Stream Flood Advisory was issued for Metropolitan Fort Wayne on the morning of the 17th with the Spy Run Creek threatening to exit its banks. The creek finally crested at 7.44 feet at 8:09 am EST. Flood Stage is 8 feet. Minor flooding also occurred along the Tiffin River in Northwest Ohio around Stryker. A Flood Warning was issued for the river in the late afternoon of October 17th. The river rose above the 11 foot flood stage that evening. All other rivers and streams rose significantly, but remained below flood stage. The Flood Warning was

updated with four Flood Statements before the river fell below flood stage on the 21st.

The third most significant rainfall event occurred from October 26th through October 28th. An average of around 0.83 inches fell across the area (COOP Data). Area rivers and streams were still receding from the rises resulting from the last rain event when renewed rises spread across the entire Hydrologic Service Area. With a lesser amount, the rises were not as great as those with the previous event. As a result, no flooding occurred.

Soil Moisture and River Levels: Soil moisture continued to increase with Northwest Indiana, Southwest and South Central Lower Michigan as well as Northwest Ohio in a moderate moist spell as indicated by the October 28, 2006 calculation of the Palmer Drought Severity Index. North Central and Northeast Indiana were close to a moderate moist spell and Southeast Lower Michigan in a very moist spell as measured by the Palmer Drought Severity Index on October 28, 2006. The numbers are as follows: Northwest Indiana (+2.68, Unusual Moist Spell), North-Central Indiana (+1.91, Moist Side of Normal), Northeast Indiana (+1.99, Moist Side of Normal), Southwest Lower Michigan (+2.66, Unusual Moist Spell), South-Central Lower Michigan (+2.65, Unusual Moist Spell), Southeast Lower Michigan (+3.24, Very Moist Spell) and Northwest Ohio (+2.29, Unusual Moist Spell).

As of November 6, 2006 Northern Indiana, Northwest Ohio and Southern Michigan rivers had flows in the 25th to 90th percentile range. Data is provided by the United States Geological Survey (USGS).

Temperature: At Fort Wayne, the average high temperature in October 2006 was 59.1 °F and the average low temperature was 39.3 °F. This gave an average temperature of 49.2 °F which was 3.2 °F below normal. At Fort Wayne, the warmest temperature reached in October 2006 was 81°F on the 3rd. The coldest temperature reached was 25 °F on the 25th. The record low for October 15th was broken when the temperature fell to 28 °F.

At South Bend, the average high temperature was 58.1 °F and the average low temperature was 39.5 °F giving an average temperature of 48.8 °F which was 3.3 °F below normal for October. The warmest temperature occurred on the 3rd (80 °F) and the coldest temperature occurred on the 29th (29 °F). The record for the coolest high temperature for October 12th was broken when the temperature failed to exceed 41 °F.

Precipitation: Precipitation was above normal at both South Bend and Fort Wayne in October 2006. At Fort Wayne, 4.35 inches of precipitation fell, 1.72 inches above normal. Just a trace of snow fell at Fort Wayne in October 2006, 0.5 inches below normal. The record for the most snowfall on an October 12th was tied at Fort Wayne when a trace of snow fell. At South Bend, 4.51 inches of precipitation fell, 1.24 inches above normal. The record for the most snowfall on an October 12th was broken when 0.3 inches fell. Snowfall totals for South Bend this October 2006 reached 1.8 inches, 1.3 inches above normal.

Weather: October 2006 began with temperatures running about 5.6 °F above normal over

the first 4 days of the month. The warmest weather occurred during the first 4 days of October. The month began with highs in the lower 70s and high temperatures rose to the lower 80s by the 3rd. A storm system and associated cold front moved through the area at this time. This system produced bouts of showers and thunderstorms. The storm system moved through by the 5th dropping highs from lower to middle 70s on the 4th to the lower 60s by the 5th. An average of over 1.3 inches of rain fell across the area on the first 5 days of October. The flood threat is covered in the Overview Section of this report. A second storm system moved toward the area on the 7th bringing in warmer air ahead of it. High temperatures moved back up into the 70s on the 8th and 9th, but little moisture accompanied the system. As a result no precipitation occurred. From the 5th through the 7th, temperatures averaged 4.3 °F below normal and from the 8th through the 9th temperatures averaged 3.3 °F above normal.

A significant change in the weather pattern followed the second storm system. High temperatures did not reach the 70s again until the 30th. High temperatures dropped from the 70s on the 9th to the upper 50s to the mid 60s by the 10th. A strong cold front then crossed the area on the 11th bringing showers and thunderstorms. About a third of an inch of precipitation fell across the area by the 13th (COOP Data). High temperatures plummeted into the lower 40s by the 12th. The first widespread freeze event followed dropping lows to around 30 °F that morning. The first snowfall of the season also occurred. A trace of snow fell at Fort Wayne tying the record for that date while a record breaking 0.3 of an inch fell at South Bend. This cold snap ended the growing season across most of the area. For the next several days, lows remained in the 30s while highs recovered into the 50s. Lows fell into the upper 20s to around 30 on the morning of the 15th with lows breaking the record at Fort Wayne as the temperature fell to 28 °F.

Warmer air then tried to return to the region by the 17th pushing highs toward the 60 °F mark. The warm air advance brought, rain, heavy at times, across the entire area leaving an average of 1.68 inches (COOP Data) by the morning of the 17th. Flooding is covered in the Overview Section of this report. High temperatures finally made it back to the lower 60s by the 18th. A cold front then moved through the area on the late on the 18th through the early morning of the 19th bringing additional rain to the area. Colder air moved back into the Western Lower Great Lakes on the 19th and 20th dropping high temperatures back into the lower 50s.

Warmer air then advanced again across the area by the 21st driving high temperatures back into the 60s. Another storm system crossed the area on the 22nd dropping highs back into the upper 40s. High temperatures fell further, dropping into the upper 30s to around 40 °F by the 23rd. Low temperatures were driven down to the 30s dropping further into the mid to upper 20s by the 25th. Snow fell with this system with much of it caused by the influence of Lake Michigan. South Bend reported 1.5 inches on the 23rd and 24th while Fort Wayne only had a trace. Coop Data only showed an average of 0.2 inches by the morning of the 25th. All of the snow melted when temperatures rose above freezing during the day. High temperatures reached the lower 50s on the 25th.

Again warmer air began another advance, but another storm system and associated cold

front brought more rain and another shot of cold air to the Western Lower Great Lakes Region. An average of just over 0.80 inches of rain fell across the area (COOP Data) on the 26th through the 28th. See Overview Section for details of any flooding. High temperatures were pushed down into the lower 40s on the 26th and 27th. This system had little colder air behind it. As a result, temperatures began to recover reaching the 50 ^{o}F mark by the 28th rising back into the lower 70s by the 30th. A weak cold front crossed the area on the 31st dropping highs back into the lower 60s. Temperature averaged 3.5 ^{o}F above normal for the 30th and 31st after averaging 5.9 ^{o}F below normal from the 10th through the 29th of October.

F**or October 2006**, Daily River and Lake Summaries (RVDs) and the Daily Hydrologic Summaries (RVAs) were issued as usual to disseminate river and precipitation information and daily and updated river forecasts. Three Hydrologic Outlooks (ESFs) were issued to disseminate probabilistic forecast numbers associated with the Advanced Hydrologic Prediction Service (AHPS) for the Maumee, St. Joseph (Michigan), the Kankakee and the Upper Wabash River Basins. Three Hydrologic Outlooks were issued to cover flood threats in late October 2006. Three Flood Watch Statements (FFAs) were issued to cover flood threats in late October. Twenty Hydrologic Statements (RVSs) were issued to disseminate river forecasts. Two Flood Statements (FLSs) were issued to cover urban and small stream flood threats over one county in Northeast Indiana. One Flood Warning (FLW) was issued for river flooding in Northwest Ohio. Three Flood Statements (FLSs) were issued to update the Flood Warning in Northwest Ohio. No Flash Flood Warnings (FFWs) or Flash Flood Statements (FFSs) were issued.

All temperature data used is from NWS Fort Wayne and South Bend data only. All precipitation data used are from COOP Weather Observers and from NWS Fort Wayne and South Bend.

NWS FORM E-5 U.S. DEPARTMENT OF COMMERCE
NOAA, NATIONAL WEATHER SERVICE

HSA OFFICE:
NWS Northern Indiana (IWX)

REPORT FOR (MONTH &YEAR):
November, 2006

MONTHLY REPORT OF RIVER AND FLOOD CONDITIONS

DATE:
December 7, 2006

TO: HYDROMETEOROLOGICAL INFO CENTER (W/OS31)
SSMC 2 – Rm. 13468
1325 EAST – WEST Highway
SILVER SPRING, MD 20910 –3283

SIGNATURE:
Michael Sabones, MIC
Greg Lamberty, Service Hydrologist

When no flooding occurs include miscellaneous river conditions such as significant rises, record low stages, ice conditions, snow cover, droughts, and hydrologic products issued (NWS Directive 10-924).

☐ An **X** inside this box indicates that no flooding occurred within this Hydrologic Service Area.

General Overview: November 2006 was warmer and slightly drier than normal across Northern Indiana, Northwest Ohio, and Extreme Southern Lower Michigan. Precipitation averaged 0.33 inches below normal. Temperatures averaged 2.4 ^{o}F above normal. (Only NWS Fort Wayne and South Bend data were used).

For the month of November 2006, the average high temperature was around 50, the average low temperature was in the mid 30s giving an average temperature in the lower 40s. (Only NWS Fort Wayne and South Bend data were used).

There were three significant precipitation events in November 2006.

The first event began on November 6th and lasted through the 8th. Rainfall amounts averaged around 0.40 inches across the entire area (COOP Data). There were some minor rises on area rivers and streams, but all remained well below flood stage.

The second event occurred from the 10th through the 12th. Rainfall amounts averaged just under a half of an inch (COOP Data). Again there were minor responses from the rivers and streams but no flooding with river levels remaining well below flood stage.

The third event occurred from the 15th through the 17th. Rainfall amounts averaged around 1.1 inches (COOP Data). Rises from this event were much more significant with minor flooding occurring along the Tiffin River in Northwest Ohio. Rises on the St. Joseph River Ohio were also noteworthy, but the river remained just below flood stage. There were significant rises on other area rivers and streams with the most significant rises other than those on the St. Joseph River Ohio and the Tiffin being the Salamonie, the Maumee, the Fish Creek, the Wabash, the Kankakee and the Blanchard Rivers in Northern Indiana and Northwest Ohio. Flood Warnings (FLWs) and Flood Statements (FLSs) were issued for the flood threat on both the St. Joseph River Ohio and the Tiffin River to cover the flood threat. All of the flooding ended by November 20th.

Soil Moisture and River Levels: Soil moisture is near saturation levels across the entire Western Lower Great Lakes region. Heavy rain on December 1, 2006 caused a further increase in soil moisture. The Palmer Drought Severity Index calculated for data through December 2, 2006 indicate this. The numbers are as follows: Northwest Indiana (+3.83, Very Moist Spell), North-Central Indiana (+3.79 Very Moist Spell), Northeast Indiana (+2.85, Unusual Moist Spell), Southwest Lower Michigan (+3.79, Very Moist Spell), South-Central Lower Michigan (+3.95, Very Moist Spell), Southeast Lower Michigan (+4.58, Extremely Moist Spell) and Northwest Ohio (+3.45, Very Moist Spell).

As of December 5, 2006 Northern Indiana, Northwest Ohio and Southern Michigan rivers had flows in the 75th to greater than 90th percentile range with record flows for the date reported on the St. Joseph River Ohio, St. Joseph River Michigan, the Maumee and the Tippecanoe Rivers.

Data is provided by the United States Geological Survey (USGS).

Temperature: At Fort Wayne, the average high temperature in November 2006 was 50.7 ^{o}F and the average low temperature was 35.0 ^{o}F. This gave an average temperature of 42.8 ^{o}F which was 2.2 ^{o}F above normal. At Fort Wayne, the warmest temperature reached in November 2006 was 66 ^{o}F on the 29th. The coldest temperature reached was 21 ^{o}F on the 3rd.

At South Bend, the average high temperature was 50.1 ^{o}F and the average low temperature was 35.3^{o}F giving an average temperature of 42.7 ^{o}F which was 2.6 ^{o}F above normal for November. The warmest temperature occurred on the 28th (65 ^{o}F) and the coldest temperature occurred on the 3rd (22 ^{o}F). The record low maximum temperature for November 2nd was tied (33 ^{o}F). The record for the warmest low temperature was broken for November 28th (49 ^{o}F) and the record for the warmest temperature for November 25th was also broken (60 ^{o}F).

Precipitation: Precipitation was below normal at both South Bend and Fort Wayne in November 2006. At Fort Wayne, 2.39 inches of precipitation fell, 0.59 inches below normal. Just a trace of snow fell at Fort Wayne in November 2006, 3.0 inches below normal. At South Bend, 3.33 inches of precipitation fell, 0.06 inches below normal. Snowfall totals for South Bend this November 2006 reached 0.2 inches, 7.5 inches below normal. Records for the wettest November 30th and November 16th were broken at South Bend (0.92 inches), (1.03 inches) respectively.

Weather: November 2006 over the Western Lower Great Lakes Region was a month of extremes with periods where temperatures averaged 12 ^{o}F above normal and where temperatures averaged 12 ^{o}F below normal.

The first 4 days of November were cold with temperatures averaging 12.3 ^{o}F below normal. High temperatures were in the low to mid 40s on the 1st. High temperatures fell even further only making it into the 30s on the 2nd. The record for the coldest high

temperature for the 2nd was tied at South Bend when the high temperature only reached 33 °F. Cold weather spilled into the 3rd when high temperatures failed to get out of the upper 30s. The cold weather was accompanied by some snow. South Bend reported 0.2 inches of snow on the 2nd but only a trace was reported at Fort Wayne.

Warmer air began to return to the area on the 4th as highs moved back to 50 °F. Light rain fell across the region on the 4th and 5th with the arrival of the warmer air. Highs rose into the 50s on the 5th through the 7th and rose into the 60s across the area by the 9th with the advance of a warm front. Scattered rain showers accompanied the frontal system as it moved through the area. The warm front was followed by a cold front. The front crossed the area from the 10th through the 11th. High temperatures fell back into the 40s by the 11th. Rain showers and isolated thunderstorms accompanied the front producing significant amounts of rain (about 0.4 inches COOP Data), but no flooding. From the 5th through the 10th, temperatures averaged 7 °F above normal.

The cold front ushered in a period of slightly below normal temperatures. High temperatures remained in the 40s falling briefly into the upper 30s in some locations on the 12th and 13th. Warmer air tried to move back into the area on the 15th but failed to get into the area. A large area of rain moved across the area on the 15th and 16th producing an average of around 1.1 inches. Rivers and streams responded strongly to this event with the Tiffin River rising above flood stage. Strong rises were also noted on the St. Joseph River Ohio, but all locations on this river remained below flood stage. Flood Warnings (FLWs) were issued for both rivers in response to the flood threat. The water was slow to recede with the Tiffin River finally falling below flood stage on the 20th. Cold air continued to dominate as Canadian high pressure kept any additional storm systems away. Temperatures averaged 2 °F below normal from the 11th through the 21st.

The weather pattern began to shift allowing warmer are to overspread the region. High temperatures returned to the 50s by the 22nd and 23rd, reaching the 60s by the 24th. Lower to middle 60s high temperatures were found across the area by 28th and 29th. Dry weather continued from the 20th through the 28th. As is common this time of year, the weather pattern began shifting back to favoring colder temperatures. A widespread area of rain overspread the region from the southwest. This rainfall was followed by a major storm system which passed over the area on November 30th and December 1st. Total average rainfall amounts from this system were around 2 inches. This will be covered in next month's report. From the 22nd through the 30th, temperatures averaged 12.1 °F above normal.

F**or November 2006**, Daily River and Lake Summaries (RVDs) and the Daily Hydrologic Summaries (RVAs) were issued as usual to disseminate river and precipitation information and daily and updated river forecasts. Three Hydrologic Outlooks (ESFs) were issued to disseminate probabilistic forecast numbers associated with the Advanced Hydrologic Prediction Service (AHPS) for the Maumee, St. Joseph (Michigan), the Kankakee and the Upper Wabash River Basins. No Hydrologic Outlooks were issued in November 2006 for local flood threats. No Flood Watch Statements (FFAs) were issued November 2006. Nineteen Hydrologic Statements (RVSs) were issued to disseminate river forecasts. No

Flood Statements (FLSs) were issued to cover urban and small stream flood threats. Three Flood Warnings (FLWs) was issued for river flooding in Northwest Ohio and Northeast Indiana. Ten Flood Statements (FLSs) were issued to update the Flood Warnings. No Flash Flood Warnings (FFWs) or Flash Flood Statements (FFSs) were issued in November 2006.

All temperature data used is from NWS Fort Wayne and South Bend data only. All precipitation data used are from COOP Weather Observers and from NWS Fort Wayne and South Bend.

NWS FORM E-5 U.S. DEPARTMENT OF COMMERCE
NOAA, NATIONAL WEATHER SERVICE

HSA OFFICE:
NWS Northern Indiana (IWX)

REPORT FOR (MONTH &YEAR):
December, 2006

MONTHLY REPORT OF RIVER AND FLOOD CONDITIONS

DATE:
January 11, 2007

TO: HYDROMETEOROLOGICAL INFO CENTER (W/OS31)
SSMC 2 – Rm. 13468
1325 EAST – WEST Highway
SILVER SPRING, MD 20910 –3283

SIGNATURE:
Michael Sabones, MIC
Greg Lamberty, Service Hydrologist

When no flooding occurs include miscellaneous river conditions such as significant rises, record low stages, ice conditions, snow cover, droughts, and hydrologic products issued (NWS Directive 10-924).

☐ An **X** inside this box indicates that no flooding occurred within this Hydrologic Service Area.

General Overview: December 2006 was warmer and wetter than normal across Northern Indiana, Northwest Ohio, and Extreme Southern Lower Michigan. Precipitation averaged 1.21 inches above normal. Temperatures averaged 7.1 ^{o}F above normal. (Only NWS Fort Wayne and South Bend data were used).

For the month of December 2006, the average high temperature was in the lower 40s, the average low temperature was in the upper 20s giving an average temperature in the mid 30s. (Only NWS Fort Wayne and South Bend data were used).

There were four significant precipitation events in December 2006:

The most significant event occurred from November 30th through December 2nd when an average of around 2.1 inches fell across the area (COOP Data). This heavy rainfall led to minor to moderate flooding along the Maumee, St. Joseph (Ohio), Tiffin, St. Marys, Wabash, Auglaize, Blanchard, Eel and the Kankakee Rivers in Northern Indiana and Northwest Ohio. All of the flood crests remained in the minor range, with only the St. Joseph (Ohio) reaching the moderate range. Flood Warnings (FLWs) and Flood Statements (FLSs) were issued to cover these flood threats. This rainfall also caused localized flooding in poor drainage areas across Northeast Indiana and Northwest Ohio as well. Flood Statements (FLSs) were issued to cover this flood threat as well.

The second most significant event occurred from December 20th through December 23rd when around one inch of rain fell (COOP Data). Flooding from this event was more localized with only the Kankakee River in Northwest Indiana being affected. A Flood Warning (FLW) and Flood Statements (FLSs) were issued to cover this flooding.

The third most significant event occurred from December 11th through December 13th when around two-thirds of an inch of rain fell (COOP Data). This event did not cause any flooding across the area. The flooding from early December had receded enough to keep

the rivers within their banks after this event was over.

The forth most significant event occurred from Christmas Day through the 26th when just under a half of an inch of rain fell across the area (COOP Data). This rainfall was enough to cause minor flooding along the Tiffin River. A Flood Warning (FLW) and Flood Statements (FLSs) were issued to cover this flooding.

Soil Moisture and River Levels: Soil moisture got more saturated across the entire Western Lower Great Lakes region in December 2006.The Palmer Drought Severity Index calculated for data through December 2, 2006 indicate this. The numbers are as follows: Northwest Indiana (+4.14, Extremely Moist Spell), North-Central Indiana (+4.16 Extremely Moist Spell), Northeast Indiana (+3.51, Very Moist Spell), Southwest Lower Michigan (+4.28, Extremely Moist Spell), South-Central Lower Michigan (+4.32, Extremely Moist Spell), Southeast Lower Michigan (+5.15, Extremely Moist Spell) and Northwest Ohio (+4.40, Extremely Moist Spell).

As of January 8, 2007 Northern Indiana, Northwest Ohio and Southern Michigan rivers had flows in the 75th to greater than 90th percentile range with the greatest flows occurring along the Bean Creek, the Tiffin and the Maumee Rivers in Northwest Ohio.

Data is provided by the United States Geological Survey (USGS).

Temperature: At Fort Wayne, the average high temperature in December 2006 was 43.5 ^{o}F and the average low temperature was 28.9 ^{o}F. This gave an average temperature of 36.2 ^{o}F which was 7.2 ^{o}F above normal. At Fort Wayne, the warmest temperature reached in December 2006 was 56 ^{o}F on the 17th and on the 22nd. The coldest temperature reached was 7 ^{o}F on the 8th. December 2006 was the 6th warmest on record at Fort Wayne.

At South Bend, the average high temperature was 42.5 ^{o}F and the average low temperature was 28.6^{o}F giving an average temperature of 35.6 ^{o}F which was 6.9 ^{o}F above normal for December. The warmest temperature occurred on the 22nd (56 ^{o}F) and the coldest temperature occurred on the 8th (5 ^{o}F). The record for the warmest December 17th was tied when the high temperature rose to 55 ^{o}F. The record for the warmest minimum temperature was broken for a December 12th when the temperature failed to fall below 45 ^{o}F. The record for the warmest minimum temperature was also set for a December 31st when the temperature failed to fall below 41 ^{o}F December 2006 was the 4th warmest at South Bend.

Precipitation: Precipitation was above normal at both South Bend and Fort Wayne in December 2006. At Fort Wayne, 4.73 inches of precipitation fell, 1.96 inches above normal. Snowfall totaled 4.8 inches in December 2006, 3.5 inches below normal. At South Bend, 3.55 inches of precipitation fell, 0.46 inches above normal. The snowfall total for South Bend this December 2006 was 4.0 inches, 15.2 inches below normal. The record for the wettest December 1st was tied at South Bend (0.62 inches) and broken at Fort Wayne, (0.79 inches) respectively. December 2006 was the 6th wettest on record at Fort Wayne.

Weather: December 2006 over the Western Lower Great Lakes Region began with temperatures slightly above normal as a large rain storm crossed the Western Lower Great Lakes region. Rainfall totals averaged around 2 inches (COOP Data) for the entire event which began back in late November. Flooding is covered in the overview section. High temperatures ranged from the upper 30s to the mid 40s on the 1st.

A strong cold front finished moving through the area by the 2nd bringing a short period of dry weather to the area. High temperatures fell into the mid 30s across the area. The rain event finished with a dusting of very light snow on the 1st. Accumulations were less than a half inch. More light snow fell across parts of the area from the 3rd through the 8th as strong northwest winds combined with weak weather disturbances remained in the area. High temperatures fell to mid to upper 20s from the 3rd through the 4th. Warmer air began to return to the Western Lower Great Lake region pushing high temperatures back into the mid 30s by the 5th and to the lower 40s by the 6th. Another cold front then approached from the northwest late on the 6th spreading light snow across much of the area as the cold air flowed across Lake Michigan. Amounts were greatest in Southern Lower Michigan with Three Rivers Michigan reporting 4 inches by the morning of the 7th. Liquid water amounts averaged to a couple hundredths of an inch (COOP Data) across the entire area.

The coldest temperatures of the month occurred on the 8th as high temperatures only reached the lower 20s with low temperatures in the single digits that morning. Temperatures averaged 7.5 ^{o}F below normal from the 1st through the 9th of December.

Another shift in the weather pattern allowed warm air to flow across the Western Lower Great Lakes and Lower Ohio Valley beginning on the 10th as high temperatures rose into the mid to upper 40s. Any remaining snow quickly melted, with amounts so small no flooding resulted from the melting. High temperatures rose to the lower 50s by the 11th with high temperatures remaining above freezing for the rest of the month. A strong jet stream from the Northern Pacific brought a series of storm systems across the country. Each storm system brought additional rain to the area.

The first system moved across the area from December 11th to December 13th and produced an average of around two-thirds of an inch (COOP Data). This event did not produce any flooding because the rivers receded enough to handle the resultant runoff. There was little cold air behind this system with high temperatures dropping only into the upper 40s and lower 50s by the 13th from the lower 50s high temperatures across the area on the 12th.

High temperatures rebounded into the mid 50s by the 14th and remained in the 50s until the 18th with only the 15th breaking the trend with highs back down into the 40s. A weak cold front passed through on the 18th dropping highs back into the low to mid 40s. High temperatures continued to fall reaching the upper 30s to around 40 degrees by the 20th. The next storm system moved across the area from December 20th through December 23rd. This system produced around one inch of rain (COOP Data) which led to some minor flooding along the Kankakee River.

High temperatures warmed into the mid 50s by the 22nd before the storm system passed. Cold Maritime Polar air spilled in across the North Central United States behind the storm dropped high temperatures back into the lower 40s by the 23rd.

The next storm system brought even colder air to the region just after Christmas dropping high temperatures back into the upper 30s. The storm system produced nearly a half inch of rain (COOP Data) across the region which produces minor flooding along the Tiffin River.

High temperatures remained in the upper 30s through the 27th when another surge of warm air overspread the Western Lower Great Lakes and Lower Ohio Valley on the 28th pushing highs back into the upper 40s. Highs reached the lower 50s by the 29th staying there through the end of the month. The storm system driving the warm air north produced an average of nearly 0.9 inches (COOP Data) from the 31st through January 1st. This caused widespread flooding across parts of Northern Indiana and Northwest Ohio. This event will be covered in the January 2007 report. From the 10th through the 31st, temperatures averaged 13.3 ^{o}F above normal.

F**or December 2006**, Daily River and Lake Summaries (RVDs) and the Daily Hydrologic Summaries (RVAs) were issued as usual to disseminate river and precipitation information and daily and updated river forecasts. Five Hydrologic Outlooks (ESFs) were issued to disseminate probabilistic forecast numbers associated with the Advanced Hydrologic Prediction Service (AHPS) for the Maumee, St. Joseph (Michigan), the Kankakee and the Upper Wabash River Basins. No Hydrologic Outlooks were issued in December 2006 for local flood threats. Six Flood Watch Statements (FFAs) were issued in December 2006 to cover river flood threats. Forty-four Hydrologic Statements (RVSs) were issued to disseminate river forecasts. Four Flood Statements (FLSs) were issued to cover urban and small stream flood threats in parts pf Northern Indiana and Northwest Ohio. Ten Flood Warnings (FLWs) were issued for river flooding in Northwest Ohio and Northern Indiana. Forty-six Flood Statements (FLSs) were issued to update the Flood Warnings. No Flash Flood Warnings (FFWs) or Flash Flood Statements (FFSs) were issued in December 2006.

All temperature data used is from NWS Fort Wayne and South Bend data only. All precipitation data used are from COOP Weather Observers and from NWS Fort Wayne and South Bend.