

**MONTHLY REPORT OF RIVER AND FLOOD CONDITIONS**

DATE:  
February 10, 2004

TO: NATIONAL WEATHER SERVICE (W/OH12X1)  
HYDROMETEOROLOGICAL INFO CENTER  
1325 EAST-WEST HIGHWAY, RM 7116  
SILVER SPRING, MD 20910

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 (WSOM E-41).

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

**General Overview:** January, 2004 was colder and slightly drier than normal across Northern Indiana, Northwest Ohio and Extreme Southern Michigan. Precipitation was 0.17 inches below normal. Temperatures averaged 2.6 °F below normal. (Only NWS Fort Wayne and South Bend data were used).

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

There were two significant precipitation event in January 2004 across the Western Lower Great Lakes. The first occurred from January 1 through January 6 when an average of 0.86 inches of precipitation (mostly snow North, mixed precipitation Central, and rain South) fell across the area.(COOP Data). Much of the precipitation fell late on the 3<sup>rd</sup> and during the day on the 4<sup>th</sup>. Precipitation type was a determining factor in gauging the flood threat across the area. Areas where the dominant precipitation type was snow experienced no flooding. In areas where the dominant precipitation type was rain, minor flooding occurred. Minor flooding began late on the 4<sup>th</sup> and stretched into the 8<sup>th</sup> in rivers in Northeast Indiana and Northwest Ohio. In addition to the fairly sharp line between the rain and snow...the precipitation amounts were much heavier in the rain areas vs the snow areas. Rainfall amounts from the 3<sup>rd</sup> through the morning of the 5<sup>th</sup> were in the 1 to 2 inch range. At Hartford City, 1.89 inches of rain fell during that time period (COOP Data). Bluffton reported 1.81 inches and 1.57 inches fell at Huntington Lake (COOP Data). To the north of the rain, significant snow fell with 5.9 inches reported at Plymouth Indiana through January 5th. Snow amounts averaged around 3.5 inches (COOP Data).

Minor flooding occurred along the St. Marys, Wabash, Salamonie and the Auglaize Rivers as a result of the rainfall. The flooding approached the moderate category on the St. Marys at Decatur. The crest at Decatur was 19.49 feet at 3 AM on the 6<sup>th</sup>. Moderate flooding begins at 20 feet. Flooding remained in the minor category elsewhere. Three flood warnings (FLWs) and 12 flood statements (FLSs) were issued to cover the flooding along

rivers in Northeast Indiana and Northwest Ohio.

The second most significant precipitation event occurred from the 25<sup>th</sup> through the 28<sup>th</sup> and was mostly snow. Precipitation amounts averaged around a third of an inch (COOP Data). Snow amounts averaged around 7 inches (COOP Data). The weather turned significantly colder and as a result there was no runoff into area rivers. There was some rises due to ice jams on the Tippecanoe and Pigeon Rivers late in January, but river levels remained below flood stage. Two Hydrologic Statements were issued on January 21 and 22 to cover an ice jam which formed on the Tippecanoe river just downstream of Ora near the Sandhill Nature Preserve. The Tippecanoe River level fell without incident on the 22<sup>nd</sup>.

The Palmer Drought Severity Index for the period ending January 31, 2004 showed some improvement in soil moisture conditions, however with much of the area snow covered and the soils frozen, the numbers may be overdone in indicating a drying trend. Soil moisture conditions ranged from “Unusually Moist” to “Extremely Moist Spell” with the wettest conditions occurring over Northern Indiana. The numbers are as follows: Northwest Indiana (+2.21, Unusually Moist Spell), North-Central Indiana (+3.39, Very Moist Spell), Northeast Indiana (+4.13 Extremely Moist Spell), Southwest Michigan (+2.30, Unusually Moist Spell) South-Central Michigan (+2.56, Unusually Moist Spell), Southeast Michigan (+3.21, Very Moist Spell), and Northwest Ohio (+3.44, Very Moist Spell).

**Temperature:** For Fort Wayne, the average high temperature in January 2004 was 27.6 °F and the average low temperature was 13.8 °F. This gave an average temperature of 20.7 °F which was 2.9 °F below normal. At South Bend, the average high temperature was 27.8 °F and the average low temperature was 14.3 °F giving an average temperature of 21.1 °F which was 2.3 °F below normal for January. The warmest temperatures occurred on the 3<sup>rd</sup> at Fort Wayne (61 °F) and on the 2<sup>nd</sup> at South Bend (61 °F). The coldest temperature occurred on the 30<sup>th</sup> at Fort Wayne (-6 °F) and on the 6<sup>th</sup> and the 30<sup>th</sup> at South Bend (-2 °F).

Record high temperatures were set on the 2<sup>nd</sup> and 3<sup>rd</sup> at Fort Wayne (58 °F), (61 °F) respectively. Record high temperatures were set at South Bend on the 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> of the month (50 °F), (61 °F), (60 °F) respectively. Record high minimum temperatures were recorded on the 2<sup>nd</sup> at both Fort Wayne (47 °F) and at South Bend (46 °F).

**Precipitation:** Precipitation was above normal at Fort Wayne and below normal at South Bend in January 2004. At Fort Wayne 2.43 inches of rain fell, 0.38 inches above normal. At South Bend, 1.56 inches of rain fell, 0.71 inches below normal. The entire area of Northern Indiana, Northwest Ohio and Extreme Southern Michigan received accumulating snow. At Fort Wayne, 20.3 inches of snow fell, 10.4 inches above normal for January. January, 2004 was the 4<sup>th</sup> snowiest January on record at Fort Wayne. At South Bend, 27.6 inches of snow fell, 4.4 inches above normal for January. Record daily snowfall amounts were set at Fort Wayne on the 23<sup>rd</sup> (2.0 inches) and on the 27<sup>th</sup> (7.4 inches). Record daily snowfall amounts at South Bend were recorded on the 4<sup>th</sup> (3.0 inches) and on the 27<sup>th</sup> (9.7 inches). Snow depths ranged from near 20 inches in Southwest Lower Michigan near Lake Michigan to around 2 inches over parts of Northwest Ohio and Northern Indiana away

from the lake effect snowbelt. On average the snow depth was around 6.4 inches (COOP Data) as January 2004 ended.

**Weather:** January, 2004 began with extremely warm temperatures. High temperatures were in the record to near record range. Highs ranged from the 50s to the lower 60s across the area. High temperature records were set at both Fort Wayne and South Bend (See Temperature Section) during the first 3 days of the month. A strong cold front then pushed through the area bringing an end to the “Spring in January” weather knocking high temperatures back into a more normal middle 30s level. A storm center developed along the front over the lower Mississippi Valley and headed northeastward moving along the Ohio River. Significant snow fell across parts of Northwest and North Central Indiana and Southern Michigan late on the 3<sup>rd</sup> extending into the morning of the 6<sup>th</sup>. Plymouth Indiana reported 6.9 inches of snow (COOP Data), Fort Wayne 3.6 inches and South Bend had 4.6 inches of snow. Southern areas reported significant rainfall amounts, with some locations receiving nearly 2 inches of rain. This led to minor flooding along the Auglaize, St. Marys, Wabash and the Salamonie Rivers. A Flood Watch was issued for parts of Northeast Indiana and Northwest Ohio on the 4<sup>th</sup>. For the first 4 days of the month, temperatures average around 18 °F above normal.

Cold dry weather moved into the area from the 6<sup>th</sup> through the 10<sup>th</sup>. High temperatures fell into the upper teens on the 6<sup>th</sup>. Low temperature fell below zero on the morning of the 6<sup>th</sup> at South Bend and the low single digits at Fort Wayne. Warmer air began moving into the area on the 7<sup>th</sup> pushing temperatures into the lower 30s by the 8<sup>th</sup>. A reinforcing shot of cold air pushed high temperatures back into the 20s by the 9<sup>th</sup>. This lasted for another day before temperatures shot back into the upper 30s on the 11<sup>th</sup>. Temperatures averaged around 6.2 °F below normal for this time period.

Warm air moved into the Western Lower Great Lakes Region by the 11<sup>th</sup> pushing high temperatures into the upper 30s. High temperatures remained in the 30s through the 14<sup>th</sup>. This was a dry period with only a few light snow showers amounting to little accumulation falling across the area. Temperatures averaged about 7 °F above normal.

Cold air began a new assault on the Great Lakes Region on the 15<sup>th</sup> pushing high temperatures back into the 20s on the 15<sup>th</sup> and 16<sup>th</sup>. Temperatures averaged about 3.3 °F below normal. Again this was a dry period with only trace amounts of snow. Warmer air briefly returned to the region on the 17<sup>th</sup> pushing high temperatures back into the lower 30s. This time light snow accompanied the warmer air with an average of 1.5 inches of snowfall (COOP Data). The warmer weather lasted only into the 18<sup>th</sup> with temperatures on the 17<sup>th</sup> and 18<sup>th</sup> averaging about 3.5 °F above normal.

A prolonged period of cold weather began on the 19<sup>th</sup> as high temperatures dropped into the upper teens to lower 20s. Warmer air tried returning to the Western Lower Great Lakes region pushing high temperatures back into the lower to middle 30s by the 20<sup>th</sup>. However

temperatures remained below normal as low temperatures were only in the single digits. A storm system developed over Southern Canada on the 23<sup>rd</sup> and moved southeast across the Upper Midwest. This system spread snow across the area, with the greatest amounts falling over Northern Indiana and Southern Michigan. Over 4 inches of snow fell at South Bend on the 23<sup>rd</sup> and 2 inches fell at Fort Wayne. This system brought more cold air into the region, dropping high temperatures into the teens by the 23<sup>rd</sup>.

A change in the weather pattern brought a series of storm systems from the Southern Plains into the Great Lakes Region. With access to Gulf of Mexico moisture, these storms were able to produce greater amounts of precipitation. The first system moved into the area on the 25<sup>th</sup>, producing a mixture of snow and sleet over parts of North Central and Northeast Indiana and Northwest Ohio. A second system dumped more snow across the area.

However the third was the worst of the three. This system moved into the region on the 27<sup>th</sup> producing significant amounts of mostly snow over the northwest half of the area, Northwest and North Central Indiana and Southern Lower Michigan. Freezing rain and sleet fell over the southeast half of the area consisting of North-Central and Northeast Indiana and Northwest Ohio on the evening of the 26<sup>th</sup> into the morning of the 27<sup>th</sup>. An average of 6.8 inches of snow fell across the entire region (COOP Data) over the 3 day period. The greatest snow amounts were found across Northwest Indiana and Southwest Lower Michigan and lesser amounts over southern sections of Northwest Ohio and Northeast Indiana where there was more freezing rain and sleet. High temperatures rose slightly into the middle 20s on the 27<sup>th</sup>.

Once the last storm was out of the way, a cold front from Canada swept through the region on the 29<sup>th</sup> bringing a dusting of snow, but the real hazard was very cold air. High temperatures were pushed into the single digits and low temperatures fell below zero. The low temperature at South Bend fell to -2 °F and -6 °F was the low at Fort Wayne on the morning of the 30<sup>th</sup>. Cold weather continued as January ended with highs in the single digits and lows below zero on the 31<sup>st</sup>. From the 19<sup>th</sup> through the 31<sup>st</sup> temperatures averaged around 10.6 °F below normal.

For January 2004, 3 Flood Warnings (FLWs) and 12 Flood Statements (FLSs) were issued for river flooding in Northeast Indiana and Northwest Ohio. Three Flood Statement were also issued to update a Flood Watch (FFA) which was issued for parts of Northeast Indiana and Northwest Ohio. That Flood Watch was also issued to cover the early January flood threat and was the only one issued in January, 2004. Thirteen Hydrologic Statements (RVSs) were issued to disseminate river forecasts alerting people to the threat of high water in Indiana and Ohio and for rapidly changing river levels due to ice jamming on the Tippecanoe River near Ora. River levels were in the normal to below normal range at January, 2004 ended.

The Daily River and Lake Summary along with the Daily Hydrologic Summary were issued as usual. Four Hydrologic Outlooks (ESFs) was issued to disseminate the tabular form of the probabilistic river flood guidance for the Kankakee River Basin in Northwest Indiana, the Maumee River Basin in Northeast Indiana and Northwest Ohio as well as the

St. Joseph River Basin in Northern Indiana and Extreme Southern Lower Michigan. This product is part of the Advance Hydrologic Prediction Service. Two Hydrologic Outlooks (ESFs) were also issued to cover flood potential from winter related factors. These Outlooks are required by Eastern Region Headquarters and are issued on a by - weekly basin from January through early April each year.

All temperature data used is NWS Fort Wayne and South Bend data only.

**MONTHLY REPORT OF RIVER AND FLOOD CONDITIONS**

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

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When no flooding occurs include miscellaneous river conditions such as significant rises, record low stages, ice conditions, snow cover, droughts, and hydrologic products issued (WSOM E-41).

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

**General Overview:** February 2004 was colder and much drier than normal across Northern Indiana, Northwest Ohio and Extreme Southern Michigan. Precipitation was 1.31 inches below normal. Temperatures averaged 1.2 °F below normal. (Only NWS Fort Wayne and South Bend data were used).

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

There were two significant precipitation events in February 2004 across the Western Lower Great Lakes. The first occurred from February 2 to February 4 when an average of 0.18 inches of precipitation (snow/glaze/rain) fell across the area (COOP Data). The second most significant precipitation event occurred from February 5 to February 9 where 0.18 inches of precipitation (snow/glaze) fell across the area (COOP Data). Neither event led to any flooding. . An average of around 6.4 inches of snow covered the ground as as February 2004 began (COOP Data). Snow water equivalent averaged from an estimated half to one and a half inches across the area with the higher totals being found in Southwest Lower Michigan and Northeast Indiana. Some spots had estimated water equivalent in the 2-inch range. Almost all of the snow melted by the end of February.

The first two and a half weeks of February were cold with temperatures averaging 4.4 °F below normal. There was some thawing of the snow pack on the 3<sup>rd</sup>, the 6<sup>th</sup> and on the 11<sup>th</sup> of the month, however little runoff resulted as the remaining snow absorbed the thawing. With well below normal precipitation levels, the flood threat decreased slowly.

Thawing temperatures entered the Western Lower Great Lakes Region on the 19<sup>th</sup> as high temperatures soared into the lower to mid 40s. The thaw caused ice jamming on the Salamonie River on the 20<sup>th</sup> that led to minor flooding near Warren. A flood warning (FLW) was issued to cover the flooding on the Salamonie. The ice jam broke on the

morning of the 21<sup>st</sup> without incident and that relieved the flooding near Warren. Snowmelt caused rising river levels elsewhere, but the rivers remained within their banks.

The Palmer Drought Severity Index for the period ending February 28, 2004 reflected the very dry February with index numbers decreasing to the normal to “Unusually Moist” level. The wettest soils continued to be in Northeast Indiana with the driest soils in Northwest Indiana. The numbers are as follows: Northwest Indiana (+0.92, Normal), North-Central Indiana (+2.32, Unusually Moist Spell), Northeast Indiana (+2.81 Unusually Moist Spell), Southwest Michigan (+1.32, Normal) South-Central Michigan (+1.67, Normal), Southeast Michigan (+2.43, Unusually Moist Spell), and Northwest Ohio (+2.13 Unusually Moist Spell).

**Temperature:** For Fort Wayne, the average high temperature in February 2004 was 33.8 °F and the average low temperature 18.0 °F. This gave an average temperature of 25.9 °F which was 1.4 °F below normal. At South Bend, the average high temperature was 34.6 °F and the average low temperature was 18.0 °F giving an average temperature of 26.3 °F which was 1.0 °F below normal for February. The warmest temperatures occurred on the 29<sup>th</sup> at Fort Wayne (59 °F) and on the 29<sup>th</sup> at South Bend (61 °F). The coldest temperature occurred on the 1<sup>st</sup> at Fort Wayne (-5 °F) and on the 4<sup>th</sup> at South Bend (1 °F).

**Precipitation:** Precipitation was below normal at both Fort Wayne and at South Bend in February 2004. At Fort Wayne 0.54 inches of rain fell, 1.40 inches below normal. At South Bend, 0.76 inches of rain fell, 1.22 inches below normal. Snowfall totals were below normal for both cities. At Fort Wayne, 1.4 inches of snow fell, 6.2 inches below normal for February. At South Bend, 5.3 inches of snow fell, 10.2 inches below normal. February 2004 was the 2<sup>nd</sup> driest at South Bend and the 9<sup>th</sup> driest at Fort Wayne. February 2004 was the 6<sup>th</sup> least snowiest at South Bend and the 7<sup>th</sup> least snowiest at Fort Wayne. Most of the snow pack was melted as February 2004 ended. Snow was confined to parts of Extreme Southern Michigan and Northeast Indiana with snow depth ranging from a tract to one inch.

**Weather:** February 2004 began with extremely cold temperatures as highs were in the lower to mid 20s on the 1<sup>st</sup>. High temperatures rose into the mid 30s by the 2<sup>nd</sup> as a storm system approached from the west. Light snow and freezing rain that became rain as the warm air moved in. Precipitation totals averaged around 0.2 inches with snowfall totals averaging around one inch (COOP Data). The precipitation ended on the 4<sup>th</sup>. Another blast of cold air entered the Western Lower Great Lakes Region dropping high temperatures back into the 20s by the 4<sup>th</sup>. There was another brief warm up on the 6<sup>th</sup> as high temperatures warmed into the lower to mid 30s. The warmer air was drawn north in response to another weak storm system which dropped around 0.2 inches of precipitation from the 5<sup>th</sup> to the 6<sup>th</sup> (COOP Data). Again the precipitation was a mix of freezing rain and snow with snow dominating on the 6<sup>th</sup> and 7<sup>th</sup>. Snowfall totals averaged around 2 inches (COOP Data).

A prolonged spell of colder than normal temperatures held sway from the 8<sup>th</sup> through the 18<sup>th</sup> of February. Highs were in the 20s and 30s and lows were in the single digits to

around 20 °F. Temperatures averaged around 5.5 °F below normal from the 8<sup>th</sup> to the 18<sup>th</sup>. A brief warm up above freezing occurred on the 11<sup>th</sup>. Some very light snow fell on the 10<sup>th</sup> and 11<sup>th</sup> but snowfall totals were insignificant.

The weather pattern began changing on the 18<sup>th</sup> as warm air began moving into the Western Lower Great Lakes Region. High temperatures rose into the 40s on the 19<sup>th</sup> and remained in the upper 30s to the 40s range till the 28<sup>th</sup> when high temperatures reached the lower 50s. The warmest day of the month was the 29<sup>th</sup> with high temperatures reaching the upper 50s to lower 60s. There was some light rain/snow on the 21<sup>st</sup> and on the 23<sup>rd</sup> to 24<sup>th</sup>. Precipitation totals were very light with no effect on local rivers and streams.

For February 2004, 1 Flood Warning (FLW) and 2 Flood Statements (FLSs) were issued to cover flooding on the Salamonie River resulting from ice jamming. Twelve Hydrologic Statements (RVSs) were issued to disseminate river forecasts alerting people to the threat of high water in Northern Indiana and Northwest Ohio.

Daily River and Lake Summaries and the Daily Hydrologic Summary were issued as usual. Two Hydrologic Outlooks (ESFs) was issued to disseminate the tabular form of probabilistic river flood guidance for the Kankakee River Basin in Northwest Indiana, the Maumee River Basin in Northeast Indiana and Northwest Ohio as well as the St. Joseph River Basin in Northern Indiana and Extreme Southern Lower Michigan. This product is part of the Advance Hydrologic Prediction Service. Two more Hydrologic Outlooks (ESFs) containing AHPS probabilistic forecasts were issued as part of the Central Region Spring Flood Outlook on February 27, 2004.

Three Hydrologic Outlooks were issued concerning snowmelt or flood potential using the traditional narrative format in February 2004.

All temperature data used is NWS Fort Wayne and South Bend data only.

**MONTHLY REPORT OF RIVER AND FLOOD CONDITIONS**

REPORT FOR (MONTH & YEAR):  
March 2004

DATE:  
April 13, 2004

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

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When no flooding occurs include miscellaneous river conditions such as significant rises, record low stages, ice conditions, snow cover, droughts, and hydrologic products issued (WSOM E-41).

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

**General Overview:** March 2004 was warmer and was slightly wetter than normal across Northern Indiana, Northwest Ohio and Extreme Southern Michigan. Precipitation was 0.21 inches above normal. Temperatures averaged 3.6 °F above normal. (Only NWS Fort Wayne and South Bend data were used).

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

There were two significant precipitation events in March 2004 across the Western Lower Great Lakes. The first occurred from March 3 to March 6 when an average of 0.81 inches of rain fell across the area (COOP Data). The second most significant precipitation event occurred from March 24 to March 27 where 0.80 inches of rain fell across the area (COOP Data). The first event led to minor flooding along the Kankakee River in Northwest Indiana, the St. Joseph and the Maumee River in Northeast Indiana and the Tiffin River in Northwest Ohio. No damage was reported with any of this flooding. Other rivers and streams rose close to flood stage, but crested below flood stage. The second event caused some rises on rivers in the area, but only the Tiffin River came within 2 feet of flood stage. An average of around 1.8 inches of snow fell across the area during March 2004 (COOP Data). The month began with little snow on the ground. Its contribution to flooding was insignificant.

The only flood event in March 2004 was a rain only event. Heavy rain fell across the entire area with most of it falling on March 4 and 5. This rainfall resulted in minor flooding along the Kankakee, Maumee, St. Joseph (Ohio) and the Tiffin Rivers. All of the flooding was minor in nature with all of the rivers cresting on March 6 and March 7. Three flood warnings (FLWs) and 10 Flood Statements (FLSs) were issued to cover the flood event.

The Palmer Drought Severity Index for the period ending April 3, 2004 showed little

change from the numbers in February 2004. The numbers are as follows: Northwest Indiana (+1.35, Normal), North-Central Indiana (+2.20, Unusually Moist Spell), Northeast Indiana (+2.18 Unusually Moist Spell), Southwest Michigan (+1.88, Normal) South-Central Michigan (+1.70, Normal), Southeast Michigan (+2.11, Unusually Moist Spell), and Northwest Ohio (+1.17 Normal).

**Temperature:** For Fort Wayne, the average high temperature in March 2004 was 49.2 °F and the average low temperature 33.3 °F. This gave an average temperature of 41.2 °F which was 3.1 °F above normal. At South Bend, the average high temperature was 49.4 °F and the average low temperature was 33.5 °F giving an average temperature of 41.5 °F which was 4.0 °F above normal for March. The warmest temperatures occurred on the 28<sup>th</sup> at Fort Wayne (74 °F) and at South Bend (77 °F). The coldest temperature occurred on the 13<sup>th</sup> at Wayne (15 °F) and at South Bend (16 °F). The coldest temperature of 16 °F at South Bend also occurred on March 22.

**Precipitation:** Precipitation was below normal at Fort Wayne and above normal at South Bend in March 2004. At Fort Wayne 2.79 inches of rain fell, 0.07 inches below normal. At South Bend, 3.37 inches of rain fell, 0.48 inches above normal. Snowfall totals were below normal for both cities. At Fort Wayne, 3.1 inches of snow fell, 1.6 inches below normal for March. At South Bend, 0.7 inches of snow fell, 8.0 inches below normal. March 2004 was the 4<sup>th</sup> least snowiest at South Bend and the 7<sup>th</sup> warmest March on record. There was no snow on the ground as March ended.

**Weather:** March 2004 began with very warm temperatures. What little snow that was left as February ended quickly melted. Area rivers and streams responded little from the last snowmelt. Highly modified Tropical air dominated the area's weather. High temperatures began the month in the upper 50s to around 60 °F. High temperatures oscillated between the lower 60s and middle 40s through the 7<sup>th</sup>. On average temperatures averaged around 12 °F above normal through March 7. Normal high temperatures are in the lower 40s and normal lows are in the middle 20s for early March. The most significant rain event in March occurred from the 3<sup>rd</sup> through the 6<sup>th</sup> when around 0.80 inches of rain fell across Northern Indiana, Southern Michigan and Northwest Ohio (COOP Data). This rainfall caused minor flooding along the St. Joseph (Ohio), Tiffin, Maumee, and Kankakee Rivers in Northern Indiana and Northwest Ohio. Again, no flood damage was reported.

A cold front signaling a change in the weather pattern lowered high temperatures back into the upper 30s on March 8. This colder weather pattern continued until March 22 with temperatures averaging around 4.4 °F below normal. Normal high temperatures are in the upper 40s to around 50 and normal low temperatures are around 30 °F for mid March. The last snowfalls for March occurred on the 8<sup>th</sup>, 12<sup>th</sup> and sporadically from the 13<sup>th</sup> to the 21<sup>st</sup>. Total snowfall amounts averaged 1.8 inches across the area (COOP Data). An average of nearly 0.4 inches of precipitation fell from the 13<sup>th</sup> through the 21<sup>st</sup> of March (COOP Data). A significant snow occurred on March 16<sup>th</sup>, but the ground was too warm in many locations so much of the snow melted as it hit the ground. Jay County in Northern Indiana received from 4 to 7 inches during this storm. Counties in Northwest Ohio received around 2 inches. A heavy snow warning was issued on March 16 to cover the snow event. The

remaining snow from this event melted in a couple of days. No flooding resulted from this snow melt.

Another shift in the weather pattern occurred on the 22<sup>nd</sup> as warmer air flowed into the area. High temperatures rose from the upper 30s on the 22<sup>nd</sup> to the 70s by the 28<sup>th</sup>. A series of storm system passed by, mostly to the north and west of the area. A significant rainfall event occurred from March 24 to March 27 when an average of around 0.8 inches of rain fell across Northern Indiana, Northwest Ohio and Southern Lower Michigan (COOP Data). There was a flood threat also associated with this rain in Northern Indiana and Northwest Ohio. However only the Tiffin River at Stryker approached flood stage. There were rises on other rivers as well, but all area rivers crested below flood stage. High temperatures cooled somewhat on March 29<sup>th</sup> rising only into the lower 60s. High temperatures continued their downward trend falling into the lower 50s by the end of March. The last 9 days were significantly warmer than normal. Normal high temperatures are in the lower 50s and normal low temperatures are in the lower 30s for late March. Temperatures for the last 9 days of March averaged around 11 °F above normal. After the rains of the 24<sup>th</sup> through the 27<sup>th</sup>, river levels resumed their fall from early March flooding to the “well below normal” levels occurring on April 12<sup>th</sup>.

For March 2004, 4 Flood Warnings (FLW) and 13 Flood Statements (FLSs) were issued to cover flooding river flooding. Fourteen Hydrologic Statements (RVSs) were issued to disseminate river forecasts alerting people to the threat of high water in Northern Indiana, Northwest Ohio and Southern Michigan. Several additional versions were lost due to computer problems. There was no flash flooding in March 2004 so no Flash Flood Warnings (FFWs) or Flash Flood Statements (FFSs) were issued in March 2004.

Daily River and Lake Summaries and the Daily Hydrologic Summaries were issued as usual. Five Hydrologic Outlooks (ESFs) were issued to disseminate Spring Flood and Water Resources Outlook, two of which disseminated probabilistic forecast numbers associated with the Advanced Hydrologic Prediction Service (AHPS). The three river basins having AHPS service are the Kankakee River Basin in Northwest Indiana, the Maumee River Basin in Northeast Indiana and Northwest Ohio as well as the St. Joseph River Basin in Northern Indiana and Extreme Southern Lower Michigan. Another Hydrologic Outlook was issued to disseminate probabilistic numbers associated with AHPS for the Maumee River Basin in Northeast Indiana and Northwest Ohio. Another Hydrologic Outlook was also issued to highlight possible flooding in early March.

All temperature data used is NWS Fort Wayne and South Bend data only.

**MONTHLY REPORT OF RIVER AND FLOOD CONDITIONS**

REPORT FOR (MONTH & YEAR):  
April 2004

DATE:  
May 11, 2004

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

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When no flooding occurs include miscellaneous river conditions such as significant rises, record low stages, ice conditions, snow cover, droughts, and hydrologic products issued (WSOM E-41).

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

**General Overview:** April 2004 was warmer and much drier than normal across Northern Indiana, Northwest Ohio and Extreme Southern Michigan. Precipitation averaged 2.59 inches below normal. Temperatures averaged 2.9 °F above normal. (Only NWS Fort Wayne and South Bend data were used).

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

There were two significant precipitation events in April 2004 across the Western Lower Great Lakes region. The second most significant precipitation event occurred from April 20 to April 23 when an average of 0.50 inches of rain fell across the area (COOP Data). The most significant precipitation event began on the evening of April 30 and continued to May 3 when an average of 1.04 inches of rain fell (COOP Data). Neither of these events led to flooding in the Northern Indiana, Northwest Ohio and Southern Lower Michigan. Rainfall was well below normal across the area. River levels declined, as a result, to well below normal levels, by April 30. Some streams approached record low levels toward the end of April. River levels rose in response to the rain event of April 30 to May 3 but crested well below flood stage. With the lack of flooding or even flood threats, no Flood Warnings (FLWs), Flash Flood Warnings (FFWs), Flood Statements (FLSs), Flash Flood Statements (FFSs), Flood Watches (FFAs) or Hydrologic Statements (RVSs) were issued in April 2004.

The Palmer Drought Severity Index for the period ending May 1, 2004 showed an acceleration of the drying trend that began in February 2004. All the Palmer numbers slipped into negative territory. The numbers are as follows: Northwest Indiana (-1.00, Dry Side of Normal), North-Central Indiana (-0.32, Normal), Northeast Indiana (-0.21, Normal), Southwest Michigan (-0.29, Normal) South-Central Michigan (-0.37, Normal), Southeast Michigan (-0.11, Normal), and Northwest Ohio (-0.95, Dry Side of Normal).

**Temperature:** For Fort Wayne, the average high temperature in April 2004 was 64.0 °F and the average low temperature 40.3 °F. This gave an average temperature of 52.2 °F which was 3.2 °F above normal. At South Bend, the average high temperature was 62.7 °F and the average low temperature was 39.1 °F giving an average temperature of 50.9 °F which was 2.6 °F above normal for April. The warmest temperatures occurred on the 18<sup>th</sup> at Fort Wayne (86 °F) and at South Bend (87 °F). The coldest temperature occurred on the 5<sup>th</sup> at Fort Wayne (23 °F) and at South Bend (22 °F). The record high temperature and record high low temperature records were broken at South Bend on April 18<sup>th</sup> (87 °F new record) and (64 °F new record) respectively. April 2004 was the 12<sup>th</sup> warmest April on record at Fort Wayne and the 14<sup>th</sup> warmest April on record at South Bend.

**Precipitation:** Precipitation was well below normal at both Fort Wayne and at South Bend in April 2004. At Fort Wayne 1.15 inches of precipitation fell, 2.39 inches below normal. At South Bend, 0.83 inches of rain fell, 2.79 inches below normal. Only a trace of snow fell at both Fort Wayne and at South Bend, which was below normal at both locations (Fort Wayne, 1.1 inches below normal) (South Bend, 1.7 inches below normal). No snow was on the ground as April ended. April 2004 was the 2<sup>nd</sup> driest at South Bend and the 4<sup>th</sup> driest at Fort Wayne on record.

**Weather:** The first 14 days of April 2004 had slightly below normal temperatures. Some very light snow fell during the first days of the month with only trace amounts recorded. April began with high temperatures in the upper 40s and lower 50s. High temperatures oscillated between the middle 40s and the middle 60s from the 1<sup>st</sup> through the 14<sup>th</sup>. Low temperatures oscillated between the lower 20s the upper 30s for the same time period. Little rain fell for the first 11 days of April. Some light rain finally moved into the area from the 12<sup>th</sup> through the 13<sup>th</sup> with totals averaging around 0.03 inches (COOP Data). Temperatures averaged around 2 °F below normal through the first 14 days of the month.

A shift in the weather pattern brought in much warmer air on April 15<sup>th</sup>. Another light rain event occurred from the 16<sup>th</sup> through the 17<sup>th</sup> with rainfall totals again averaging around 0.03 inches (COOP Data). High temperatures rose into the lower 70s on the 15<sup>th</sup> reaching the upper 80s by the 18<sup>th</sup>. A record high temperature and a record high low temperature were recorded at South Bend on the 18<sup>th</sup>. The extremely warm weather ended on the 20<sup>th</sup> as cooler air moved into the region. High temperatures were knocked down into the 60s on the 20<sup>th</sup>. The arrival of cooler temperatures coincided with the second most significant rainfall event of the month. An average of around 0.5 inches (COOP Data) fell across the area from the 20<sup>th</sup> to the 23<sup>rd</sup> with high temperatures slumping into range from the upper 50s on the 22<sup>nd</sup>. Warmer air returned by the 23<sup>rd</sup> pushing high temperatures back into the mid 60s to as high as the lower 70s through the 25<sup>th</sup>. Light rain occurred from the 24<sup>th</sup> through the 27<sup>th</sup> with an average of 0.11 inches falling (COOP Data). Temperatures from the 15<sup>th</sup> through the 25<sup>th</sup> averaged around 9.8 °F above normal.

Once the rain ended, cooler air again moved into the area dropping high temperatures into the middle 40s on the 27<sup>th</sup>. A trace of snow fell at Fort Wayne on the 27<sup>th</sup>. This cool snap lasted only 2 days. Temperatures averaged about 6.8 °F below normal for the 26<sup>th</sup> and 27<sup>th</sup>.

High temperatures spiked back into the 70s on the 28<sup>th</sup> and remained there as April ended. Temperatures averaged 9 °F above normal for the last 3 days of April. A storm system approached the area on the 30<sup>th</sup> spreading rain into the region that evening. The rain continued, on and off, into early May.

For April 2004, No Flood Warnings (FLW) and no Flood Statements (FLSs) were issued to cover river flooding. No Hydrologic Statements (RVSs) were issued due to the lack of high water. There was no flash flooding in April 2004 so no Flash Flood Warnings (FFWs) or Flash Flood Statements (FFSs) were issued in April 2004. No Flood Watches (FFAs) were issued in April 2004 due to the dry weather.

Daily River and Lake Summaries and the Daily Hydrologic Summaries were issued as usual in April 2004. One Hydrologic Outlook (ESF) was issued to disseminate the final Spring Flood and Water Resources Outlook. Five other Hydrologic Outlooks were issued to disseminate probabilistic forecast numbers associated with the Advanced Hydrologic Prediction Service (AHPS). The three river basins having AHPS service are the Kankakee River Basin in Northwest Indiana, the Maumee River Basin in Northeast Indiana and Northwest Ohio as well as the St. Joseph River Basin in Northern Indiana and Extreme Southern Lower Michigan. Only the Upper Wabash River Basin does not have AHPS probabilistic forecasts.

All temperature data used is NWS Fort Wayne and South Bend data only.

**MONTHLY REPORT OF RIVER AND FLOOD CONDITIONS**

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

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When no flooding occurs include miscellaneous river conditions such as significant rises, record low stages, ice conditions, snow cover, droughts, and hydrologic products issued (WSOM E-41).

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

**General Overview:** May 2004 was warmer and much wetter than normal across Northern Indiana, Northwest Ohio and Extreme Southern Michigan. Precipitation averaged 2.57 inches above normal. Temperatures averaged 2.5 °F above normal. (Only NWS Fort Wayne and South Bend data were used).

For the month of May, 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 three significant precipitation events in May 2004 across the Western Lower Great Lakes. The most significant rainfall event occurred from May 30 to June 1 when an average of 1.97 inches fell across the area (COOP Data) with the greatest amounts falling in Northeast Indiana and Northwest Ohio. Minor flooding along the Eel and Upper Wabash Rivers occurred as a result of the heavy rainfall. Flood Warnings (FLWs) were issued to cover that flooding. However the heaviest rains fell in the Maumee River Basin that covers Northeast Indiana and Northwest Ohio. Some basins had average rainfall of 3 inches, however there was no river flooding as most rivers crested just below flood stage. With the heavy rainfall and the threat of flooding very real, Flood Warnings (FLWs) were issued for the Maumee, Auglaize, Tiffin, St. Joseph (Ohio) and the St. Marys Rivers in the Maumee River Basin. The heavy rain was caused by two waves of thunderstorms that swept through the Lower Great Lakes Region on May 30<sup>th</sup>. The intense heavy rain that accompanied the storms prompted the issuance of Flood Statements (FLSs) for urban and small stream flooding across much of Northern Indiana and Northwest Ohio. The response of small creeks was more significant in the Fort Wayne Metropolitan area. The prompted the issuance of a Flash Flood Warning (FFW) for Allen County in Indiana.

The second most significant precipitation event occurred from May 17 through May 26 when a total average rainfall of 1.87 inches fell (COOP Data). This rain led to some river flooding along the Blanchard and Tiffin Rivers in Northwest Ohio on May 23<sup>rd</sup> through

May 25<sup>th</sup>. Other rivers and streams rose, but remained below flood stage. Flood Warnings (FLWs) were issued for both rivers to cover the flood threat.

The third most significant rainfall event occurred from May 6 to May 15 when an average of 1.83 inches of rain fell across the area (COOP Data). The greatest amounts fell on the May 7 and May 8 when an average of 0.48 inches fell (COOP Data). The rainfall caused some urban and small stream flooding across Northeast Indiana. Larger rivers and streams, however remained in their banks during this event because the rain was stretched out over such a long time. No damage was reported with any of the flooding in May 2004.

The Palmer Drought Severity Index for the period ending June 5, 2004 showed a marked improvement in soil moisture across the area. All the Palmer numbers but two moved back into the plus column. The numbers are as follows: Northwest Indiana (-0.57, Dry Side of Normal), North-Central Indiana (+0.14, Normal), Northeast Indiana (+0.40, Normal), Southwest Michigan (+1.54, Wet Side of Normal), South-Central Michigan (+2.09, Unusual Moist Spell), Southeast Michigan (+1.56, Wet Side of Normal), and Northwest Ohio (-0.42, Dry Side of Normal).

**Temperature:** For Fort Wayne, the average high temperature in May 2004 was 73.9 °F and the average low temperature 52.5 °F. This gave an average temperature of 63.2 °F which was 2.8 °F above normal. At South Bend, the average high temperature was 72.1 °F and the average low temperature was 51.5 °F giving an average temperature of 61.8 °F which was 2.2 °F above normal for May. The warmest temperatures occurred on the 6<sup>th</sup> and the 22<sup>nd</sup> at Fort Wayne (85 °F) and on the 9<sup>th</sup> at South Bend (88 °F), a record high for this date. The coldest temperature occurred on the 3<sup>rd</sup> at Fort Wayne (31 °F) and on the 3<sup>rd</sup> at South Bend (29 °F), tied record low for that date.

**Precipitation:** Precipitation was well above normal at both Fort Wayne and at South Bend in May 2004. At Fort Wayne 6.71 inches of rain fell, 2.96 inches above normal. At South Bend, 5.67 inches of rain fell, 2.17 inches above normal. May 2004 was the 7<sup>th</sup> wettest at Fort Wayne and the 9<sup>th</sup> wettest at South Bend. Two rainfall records were set in May 2004, 1.08 inches fell at Fort Wayne on May 7, which broke the rainfall record for that date and 1.53 inches fell at South Bend on May 30, which broke the record set for that date.

**Weather:** May 2004 began as cool and wet with high temperatures ranging from the upper 40s to the upper 60s. Temperatures averaged 8.6 °F below normal for the first 4 days of May. Much of the rain in the first 4 days of the month fell on the 1<sup>st</sup> as a cold front moved through the Western Lower Great Lakes. Low temperatures fell into the upper 20s and lower 30s on the 2<sup>nd</sup> and 3<sup>rd</sup> leading to frost formation. Warmer air then moved into the Great Lakes Region on the 5<sup>th</sup> pushing high temperatures into the 80s by the 6<sup>th</sup>. A weak cool air mass moved in on the 7<sup>th</sup> dropping high temperatures to the 60s and lower 70s. That cool down was short lived as high temperatures rebounded into the 80s on the 8<sup>th</sup> staying there until 12<sup>th</sup> when another storm system moved through the area bringing cooler temperatures to the region. High temperatures fell into the upper 50s on the 15<sup>th</sup> as another cooler air mass moved into the region. High temperatures rebounded back into the upper 60s to around 70 °F on the 16<sup>th</sup> and back into the 80s on the 17<sup>th</sup>. The warm weather

continued through the 23<sup>rd</sup> when a shift in the weather pattern allowed cooler air to become entrenched across the area. Temperatures averaged 7.7 °F above the normal from the 5<sup>th</sup> through the 23<sup>rd</sup>. Cooler air moved into the area on the 24<sup>th</sup> limiting high temperatures to the 60s and 70s through the end of May. Temperatures averaged 3.5 °F below normal from the 24<sup>th</sup> through the 31<sup>st</sup>.

There was rainfall on 25 of the 31 days in May 2004 as the polar front oscillated back and forth across the Western Lower Great Lakes region. Maritime tropical air masses dominated the region's weather for much of the month. The heaviest rainfall events are covered in the **General Overview** Section.

For May 2004, Daily River and Lake Summaries and the Daily Hydrologic Summaries were issued as usual. One Hydrologic Outlook (ESF) was issued on May 19<sup>th</sup> to address a flood threat. Five other Hydrologic Outlooks (ESFs) were issued to disseminate probabilistic forecast numbers associated with the Advanced Hydrologic Prediction Service (AHPS). The three river basins having AHPS service are the Kankakee River Basin in Northwest Indiana, the Maumee River Basin in Northeast Indiana and Northwest Ohio as well as the St. Joseph River Basin in Northern Indiana and Extreme Southern Lower Michigan. Only the Upper Wabash River Basin does not have AHPS probabilistic forecasts. Four Flood Warnings (FLWs) were issued for river flooding. Two Flood Warnings (FLWs) were issued to address areal flooding. Sixteen Flood Statements (FLSs) were issued to address urban and small stream flooding. Fourteen Flood Statements (FLSs) were issued to update Flood Warnings (FLWs) issued for river flooding. Eight Flood Watches (FFAs) were issued to address flood threats and 11 Hydrologic Statements (RVSs) were issued to disseminate. One Flash Flood Warning (FFW) and 2 Flash Flood Statements were issued to address flash flooding in Allen County Indiana.

All temperature data used is NWS Fort Wayne and South Bend data only.

**MONTHLY REPORT OF RIVER AND FLOOD CONDITIONS**

REPORT FOR (MONTH & YEAR):  
June 2004

DATE:  
July 15, 2004

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

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When no flooding occurs include miscellaneous river conditions such as significant rises, record low stages, ice conditions, snow cover, droughts, and hydrologic products issued (WSOM E-41).

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

**General Overview:** June 2004 was cooler and wetter than normal across Northern Indiana, Northwest Ohio and Extreme Southern Lower Michigan. Precipitation averaged 1.08 inches above normal. Temperatures averaged 2.1 °F below normal. (Only NWS Fort Wayne and South Bend data were used).

For the month of June, 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 one very significant precipitation event in June 2004 across the Western Lower Great Lakes. A persistent frontal boundary extended across Northern Illinois, Central Indiana and into Central Ohio in mid June. This boundary separated very warm over the Lower Mississippi Valley from cooler air over the Upper Great Lakes region. Weather disturbances moving along the front interacted with the warm moist air leading to several episodes of extremely heavy rain. The situation persisted for nearly a week. The heavy rain caused flooding across much of the Hydrologic Service Area (HSA). The rain event lasted from June 9 through June 15. An average of nearly 3.75 inches fell (COOP Data).

A total of 7 Flash Flood Warnings (FFWs), 8 Areal Flood Warnings (FLWs) and 19 River Flood Warnings (FLWs) were issued during this event. A Hydrologic Outlook (ESF) was issued on June 10<sup>th</sup> alerting the public to the possible threat of flooding. The Hydrologic Outlook was followed up by a Flood Watch (FFA) issued on June 11<sup>th</sup> for counties in the Upper Wabash River Basin. The flood watch was later expanded to the entire HSA as the event unfolded. The issuance of the initial Flood Watch was prompted by the very heavy rain that occurred on the 10<sup>th</sup>. An average of 1.33 inches of rain (COOP Data) fell across the area through the morning of the 11<sup>th</sup>. There was potential for additional heavy rain as well so the flood watch was issued for areas that had the highest rainfall totals from the pervious event. The initial heavy rain caused flash flooding in Miami and Cass Counties in Northern Indiana early on the morning of the 11<sup>th</sup>. Floodwater caused large boulders to

wash on to US Route 24, a major highway, west of Logansport Indiana. The obstruction was responsible for one auto accident. Some locations received over 2 inches of rain with Young America in Extreme Southern Cass County receiving nearly 3 inches.

The second bout of heavy rain began on the night of June 11 and extended into the morning of the 12<sup>th</sup> when a large storm system developed over Northern Illinois and moved across Northern Indiana, Extreme Southern Lower Michigan and Northwest Ohio. Radar estimated that around 6 inches of rain was received in some locations in this single episode. An average of 1.27 inches of rain (COOP Data) fell across the entire area through the morning of the 12<sup>th</sup>. The largest rainfall amounts reported were: Ligonier in Noble County in Northern Indiana 3 inches, South Bend Waste Water Treatment Plant 2.80 inches and Decatur Indiana 3.77 inches. There were unofficial reports of 2.3 inches at Columbia City and 2.75 inches at Cromwell Indiana. The heavy rain led to the issuance of Flash Flood Warnings for Berrien County in Michigan and White and Cass Counties in Northern Indiana. The rainfall with this storm system was more widespread than that from the storms that occurred on June 10-11. As a result, flood statements for street and small stream flooding were issued for 23 counties in Northern Indiana and 3 counties in Southern Lower Michigan. Areal Flood Warnings (FLWs) were issued for 6 counties in Northern Indiana as the flooding continued into the evening of the 12<sup>th</sup> in some locations. Runoff from the heavy rain began to cause flooding along some of the larger rivers in Northern Indiana, Extreme Southern Lower Michigan and Northwest Ohio. Flood Warnings (FLWs) were issued for the St. Joseph (Michigan), the Elkhart, Kankakee, Eel, Tippecanoe, Wabash, Maumee, Tiffin, St. Marys and St. Joseph (Ohio) Rivers on June 12<sup>th</sup>.

More heavy rain fell from the morning of the 12<sup>th</sup> to the morning of 13<sup>th</sup>, but the areal coverage was more scattered than the previous two days. Laotto in Northeast Indiana reported 1.62 inches and Paulding in Northwest Ohio reported 1.14 inches. Another round of storms moved through the area on the 13<sup>th</sup> and 14<sup>th</sup> with more heavy rain. The heaviest rain fell across Northeast Indiana and Northwest Ohio. Rainfall totals between 1 and 2 inches were common across the area. Smith Field in Fort Wayne received 2.48 inches, the highest total. The rain prompted the issuance of Flash Flood Warnings for Cass, Miami, Wabash, Allen and Whitley Counties in Northern Indiana and Paulding and Defiance Counties in Northwest Ohio. Areal Flood Warnings (FLWs) were issued for 2 counties in Northeast Indiana. With this heavy rain, more main stem rivers began flooding. River Flood Warnings (FLWs) were issued for the Little River in Northeast Indiana and the Auglaize and Blanchard Rivers in Northwest Ohio.

Heavy rain became more scattered on the 14<sup>th</sup> and 15<sup>th</sup> with the highest amounts reported being around  $\frac{3}{4}$  inches. Two last Flood Warnings (FLWs) were issued for the Yellow and the Kankakee Rivers in Northern Indiana on the 14<sup>th</sup>. With the rainfall winding down, floodwaters began to recede with the flooding finally coming to an end on June 22<sup>nd</sup> as the Tiffin River in Northwest Ohio retreated back into its banks. At the height of the flooding, river flooding reached the moderate level along the Eel, Maumee, Little and the St. Marys Rivers. The crest of the Eel at North Manchester reached 12.99 feet on June 14<sup>th</sup> (Flood Stage 9 feet). The Maumee River at Fort Wayne reached 20.83 feet on June 14<sup>th</sup> (Flood Stage 17 feet) and 21.37 feet at New Haven Indiana on June 16<sup>th</sup> (Flood Stage 15 feet).

The Little River at Huntington reached 16.92 feet on June 14<sup>th</sup> (Flood Stage 15 feet). The St. Marys River at Decatur reached 20.68 feet on June 14<sup>th</sup> (Flood Stage 17 feet). There was a lot of sandbagging in the town of South Whitley near the headwaters of the Eel River in Northeast Indiana.

There was one last bout of heavy rain on June 17<sup>th</sup> before the weather pattern changed. These storms prompted the issuance of Flood Statements (FLSs) for street and small stream flooding in parts of Extreme Southern Lower Michigan, Northeast Indiana and Northwest Ohio and one last Flood Warning (FLW) for the Wabash River.

The Palmer Drought Severity Index for the period ending July 3, 2004 continued to show improvement in soil moisture. All climate divisions had normal soil moisture conditions with two approaching the Unusual Soil Moisture category. The numbers are as follows: Northwest Indiana (+0.07, Normal), North-Central Indiana (+1.43, Moist Side of Normal), Northeast Indiana (+1.96, Moist Side of Normal), Southwest Michigan (+1.81, Moist Side of Normal), South-Central Michigan (+1.46, Moist Side of Normal), Southeast Michigan (+1.26, Moist Side of Normal), and Northwest Ohio (+0.31, Normal).

**Temperature:** For Fort Wayne, the average high temperature in June 2004 was 77.9 °F and the average low temperature 57.2 °F. This gave an average temperature of 67.5 °F which was 2.2 °F below normal. At South Bend, the average high temperature was 76.8 °F and the average low temperature was 57.4 °F giving an average temperature of 67.1 °F which was 1.9 °F below normal for June. The warmest temperatures occurred on the 8<sup>th</sup> at both Fort Wayne (89 °F) and at South Bend (91 °F). The coldest temperature occurred on the 6<sup>th</sup> and on the 26<sup>th</sup> at Fort Wayne (48 °F), the low temperature on the 26<sup>th</sup> at Fort Wayne tied the record low for the date. The coldest temperature at South Bend was 47 °F which occurred on the 20<sup>th</sup>.

**Precipitation:** Precipitation was above normal at both Fort Wayne and at South Bend in June 2004. At Fort Wayne 5.30 inches of rain fell, 1.26 inches above normal. At South Bend, 5.09 inches of rain fell, 0.90 inches above normal. One rainfall record was set at South Bend in June 2004 when 2.16 inches of rain fell on the 12<sup>th</sup>.

**Weather:** The most significant rainfall event that occurred in June 2004 is covered in the **General Overview** Section. June, 2004 began cooler than normal across the Western Lower Great Lakes region with temperatures averaging 3.8 °F below normal for the first 5 days. The heavy rain event that ended May 2004 spilled into June 1<sup>st</sup>, but rivers were in retreat and the additional rain did nothing to reverse the trend. Maritime Polar air masses were the dominant feature over the Western Lower Great Lakes region. There was scattered rainfall across the area on the 2<sup>nd</sup> and 3<sup>rd</sup> but amounts were light. High temperatures only ranged from the upper 60s to mid 70s on the 2<sup>nd</sup> and 3<sup>rd</sup>.

Warmer Maritime Tropical air began to move into the area by the 6<sup>th</sup> as high temperatures approached the 80 °F mark. High temperatures moved past that mark reaching the upper 80s to lower 90s by the 8<sup>th</sup> as tropical air established itself across the Western Lower Great Lakes region. Temperatures averaged 4.5 °F above normal from the 6<sup>th</sup> through the 18<sup>th</sup>.

This period was a very wet one as an average of nearly 3.75 inches of rain (COOP Data) fell across the area from June 9 through June 15. The heavy rain caused flooding and flash flooding across Northern Indiana, Extreme Southern Lower Michigan and Northwest Ohio along with flooding larger rivers. The flooding cause crop damage in Van Wert County in Northwest Ohio and homes were flooded in White and Miami Counties in Northern Indiana. Elsewhere there was extensive lowland and agricultural flooding. A slow moving frontal boundary stalling over Northern Indiana was the cause of the heavy rain. Weak weather disturbances would move along this front. These disturbances would interact with the warm moist air setting off showers and thunderstorms. These conditions lasted for nearly one week leading to repeated heavy rainfalls. The situation changed when a stronger weather disturbance pushed through the Great Lake region on the 18<sup>th</sup>, moving the pesky front well to the south, giving the area a respite from the very wet weather.

Cool Maritime Polar air masses dominated the region's weather for the rest of the month. Temperatures averaged 7.7 °F below normal from the 19<sup>th</sup> through the end of June. High temperatures were only in the 60s and 70s and did not reach 80 °F across the entire region until the 29<sup>th</sup>. There was one good rain event that occurred during this time period and it lasted from 24<sup>th</sup> through the 26<sup>th</sup>. An average of around a quarter of an inch of rain fell (COOP Data) in this event which cause no flooding. June ended with a warming trend as high temperatures returned to the lower 80s.

River levels as of July 14, 2004 ranged from above to below normal across the area. The Kankakee River was in the below normal range and the St. Joseph River (Michigan) along with some of it tributaries above normal. Other area rivers were in the normal range.

For June 2004, Daily River and Lake Summaries (RVDs) and the Daily Hydrologic Summaries (RVAs) were issued as usual. One Hydrologic Outlook (ESF) was issued on June 10<sup>th</sup> to alert the public to the possibility of flooding. Four other Hydrologic Outlooks (ESFs) were issued to disseminate probabilistic forecast numbers associated with the Advanced Hydrologic Prediction Service (AHPS). The three river basins having AHPS service are the Kankakee River Basin in Northwest Indiana, the Maumee River Basin in Northeast Indiana and Northwest Ohio as well as the St. Joseph River Basin in Northern Indiana and Extreme Southern Lower Michigan. Only the Upper Wabash River Basin does not have AHPS probabilistic forecasts.

Seven Flash Flood Warnings (FFWs) covering 12 counties were issued in June 2004. Eight Flash Flood Statements (FFSs) were issued in June 2004 to provide more information about the flash flooding. Twenty-one Flood Watches (FFAs) were issued to cover the flood threat in mid June for 603 counties. Eight Flood Warnings (FLWs) were issued for 10 counties in June 2004 to cover general flooding. Nineteen Flood Warnings (FLWs) and 57 Flood Statements (FLSs) were issued to cover river flooding in June 2004. Twenty-six Flood Statements (FLSs) were issued for 55 counties to address urban and small stream flooding and update Flood Warnings (FLWs) for counties in June 2004. Twenty-one Hydrologic Statements (RVSs) were issued to disseminate river forecasts in June 2004.

All temperature data used is NWS Fort Wayne and South Bend data only.

**MONTHLY REPORT OF RIVER AND FLOOD CONDITIONS**

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

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When no flooding occurs include miscellaneous river conditions such as significant rises, record low stages, ice conditions, snow cover, droughts, and hydrologic products issued (WSOM E-41).

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

**General Overview:** July 2004, like June 2004 was cooler and wetter than normal across Northern Indiana, Northwest Ohio and Extreme Southern Lower Michigan. Precipitation averaged 1.16 inches above normal. Temperatures averaged 2.0 °F below normal. (Only NWS Fort Wayne and South Bend data were used).

For the month of July, 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).

Several rainfall events took place across the Western Lower Great Lakes Region but the two most significant ones occurred from July 3 to July 8 and from July 21 to July 23.

The first event extended from July 3 to July 8 when several storm systems moved along a frontal boundary that extended across the Western Lower Great Lakes. An average of 1.17 inches of rain fell across the area (COOP Data) for the 6 days. With river levels having receded well below flood stage from the June flooding, the duration and rainfall amounts were not enough to cause any flooding.

The second event occurred from July 21 to July 23 when an average of 1.64 inches of rain fell across the area (COOP Data). Again, river levels were well below flood stage at the start of this event so no river flooding occurred. However some areas in Northwest Ohio had flash flooding. A Flash Flood Warning (FFW) was issued for Van Wert County in Northwest Ohio on the evening of July 22<sup>nd</sup>. Two Flash Flood Statements (FFSs) were issued to update and end the Flash Flood Warning. The heavy rain forced the closure of two roads in Van Wert Ohio. A truck was also reported stranded in high water. The water was 3 feet deep over some stretches of the closed roads. Flood Statements (FLSs) were issued on July 21<sup>st</sup> for parts of Northern Indiana and Northwest Ohio for flooding of small streams and creeks.

Other less significant rainfall events occurred: from July 9 to July 12 (Average of 0.52 inches COOP Data), July 16 to July 18 (Average of 0.57 inches COOP Data), July 26 to July 28 (Average of 0.31 inches COOP Data) and July 30 to August 1 (Average of 0.31 inches COOP Data).

Several Flood Statements (FLSs) for small stream and street flooding were issued on July 16<sup>th</sup> and 18<sup>th</sup> when thunderstorms producing very heavy rain occurred across parts of Northern Indiana, Northwest Ohio and Extreme Southern Lower Michigan. The other rainfall events did not produce any flooding.

The Palmer Drought Severity Index for the period ending July 31, 2004 continued to show adequate to unusually moist soils across the Hydrological Service Area. The numbers are as follows: Northwest Indiana (-0.22, Normal), North-Central Indiana (+1.72, Moist Side of Normal), Northeast Indiana (+2.69, Unusual Moist Spell), Southwest Michigan (+0.25, Normal), South-Central Michigan (+2.15, Unusual Moist Spell), Southeast Michigan (+2.61, Unusual Moist Spell), and Northwest Ohio (+0.56, Normal).

**Temperature:** For Fort Wayne, the average high temperature in July 2004 was 80.8 °F and the average low temperature was 61.4 °F. This gave an average temperature of 71.1 °F which was 2.3 °F below normal. At South Bend, the average high temperature was 80.4 °F and the average low temperature was 62.1 °F giving an average temperature of 71.3 °F which was 1.7 °F below normal for July. The warmest temperatures occurred on the 22<sup>nd</sup> at Fort Wayne (90 °F) and on the 21<sup>st</sup> at South Bend (88 °F). The coldest temperature occurred on the 28<sup>th</sup> at both Fort Wayne (53 °F) (Tied the old record set in 1992), and South Bend (54 °F). A record for the coolest high temperature was set on July 24<sup>th</sup> at South Bend when the high temperature only reached 74 °F. The old record was 77 °F set in 1998.

**Precipitation:** Precipitation was above normal at both Fort Wayne and at South Bend in July 2004. At Fort Wayne 5.51 inches of rain fell, 1.93 inches above normal. At South Bend, 4.12 inches of rain fell, 0.39 inches above normal. One rainfall record was set at South Bend on July 3<sup>rd</sup> when 1.14 inches of rain fell. The old record of 1.05 inches was set back in 1950.

**Weather:** The two most significant precipitation events that happened in July, 2004 are covered in the **General Overview** Section.

July, 2004 began warmer than normal across the Western Lower Great Lakes region with temperatures averaging 1.7 °F above normal for the first 4 days. High temperatures were in reached the upper 80s on the 3<sup>rd</sup>. Showers and thunderstorms developed and moved across the area from July 3<sup>rd</sup> to July 8<sup>th</sup> as a stationary front sat near the Western Lower Great Lakes region. Temperatures began cooling on the 5<sup>th</sup> with high temperatures falling back into the upper 70s to lower 80s.

The cooler temperatures continued from the 5<sup>th</sup> through the 9<sup>th</sup> with the 6<sup>th</sup> as an exception when Maritime Tropical air made a brief return sending high temperatures into the upper 80s. Otherwise, temperatures averaged 1.8 °F below normal. That front remained close to

the area causing periodic bouts of showers and thunderstorms. The front moved north of the area on July 9<sup>th</sup> allowing warm air to return to the Western Lower Great Lakes. High temperatures reached the mid to upper 80s on the 11<sup>th</sup>. Northern Indiana, Northwest Ohio and Extreme Southern Lower Michigan were plagued by scattered showers and thunderstorms through the 12<sup>th</sup>. These showers and storms did not lead to any flooding. From the 10<sup>th</sup> through the 13<sup>th</sup>, temperatures averaged 2.9 °F above normal.

A stronger storm system then pushed the front south of the area on the 13<sup>th</sup>. High temperatures fell into the 70s by the 14<sup>th</sup>. However with the hot July sun, temperatures moderated back into the 80s on the 16<sup>th</sup>. High temperatures continued to be below normal, averaging 3.6 °F below normal from the 14<sup>th</sup> through the 19<sup>th</sup>.

The most significant rain event occurred from July 21 through July 23 when an average of 1.64 inches of rain fell across the Western Lower Great Lakes (COOP Data). Warm Maritime Tropical air dominated the region's weather for those 3 days. High temperatures were in the 80s to around 90 °F. Temperatures averaged 3.5 °F above normal from July 20<sup>th</sup> through July 22<sup>nd</sup>.

The storm system that caused the heavy rain was strong enough to push the front well south of the Western Lower Great Lakes. Cool Canadian air spilled across the U.S./Canada border behind the front. High temperatures were pushed back into the lower 70s on the 23<sup>rd</sup>. The high temperature at South Bend did not get out of the upper 60s on the 27<sup>th</sup>. Cool Maritime Polar air continued pouring in across the border keeping high temperatures in the 70s. One storm system, however, allowed some warm air to return to Northern Indiana, Northwest Ohio and Extreme Southern Michigan. High temperatures returned to the upper 70s and lower 80s on the 28<sup>th</sup>, but that warm up was short lived as another reinforcing shot of cool air came into the Western Lower Great Lakes region. Showers and thunderstorms developed ahead of this system from the 26<sup>th</sup> through the 28<sup>th</sup> (average of 0.31 inches COOP Data) and a second system moved across the area from July 31<sup>st</sup> through August 1<sup>st</sup> (average of 0.31 inches COOP Data). No flooding was reported with either of these systems. Temperatures averaged 6.0 °F below normal from July 23<sup>rd</sup> to July 31<sup>st</sup>. The month closed with high temperatures reaching to around 80 °F.

River levels as of August 7, 2004 were mostly in the normal range. A location in Northwest Indiana had below normal flow but other spots in Northeast Indiana and Northwest Ohio reported above normal flow.

For July 2004, Daily River and Lake Summaries (RVDs) and the Daily Hydrologic Summaries (RVAs) were issued as usual. Three Hydrologic Outlooks (ESFs) were issued to disseminate probabilistic forecast numbers associated with the Advanced Hydrologic Prediction Service (AHPS). The three river basins having AHPS service are the Kankakee River Basin in Northwest Indiana, the Maumee River Basin in Northeast Indiana and Northwest Ohio as well as the St. Joseph River Basin in Northern Indiana and Extreme Southern Lower Michigan. Only the Upper Wabash River Basin does not have AHPS probabilistic forecasts.

One Flash Flood Warning (FFWs) covering 1 county was issued in July 2004. Two Flash Flood Statements (FFSs) were issued in July 2004 to provide more information about the flash flooding. Sixteen Flood Statements (FLSs) were issued for 24 counties to address urban and small stream flooding in July 2004. Three Hydrologic Statements (RVSs) were issued to disseminate river forecasts in July 2004. No Flood Warnings (FLWs) were issued for river or areal flooding.

All temperature data used is NWS Fort Wayne and South Bend data only.

**MONTHLY REPORT OF RIVER AND FLOOD CONDITIONS**

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

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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).

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

**General Overview:** August 2004 continued the trend set in June 2004 being cooler and wetter than normal across Northern Indiana, Northwest Ohio and Extreme Southern Lower Michigan. Precipitation averaged 1.62 inches above normal. Temperatures averaged 3.8 °F below normal. (Only NWS Fort Wayne and South Bend data were used).

For the month of August, the average high temperature was in the mid 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 were three very significant rain events in August 2004 across the Western Lower Great Lakes Region.

The first event extended from August 3 to August 5 when a cold front moved slowly across the Lower Great Lakes region. An average of 1.09 inches of rain fell across the area (COOP Data). With river levels having receded well below flood stage from the June flooding, the duration and rainfall rate was not great enough to cause any flooding.

The second significant event occurred from August 17 to August 21 when an average of 2.06 inches of rain fell across the area (COOP Data). Water levels in local rivers and streams rose a little, but crested well below flood stage. There were, however, periods of very heavy rain across parts Northwest Indiana which led to low area and small creek flooding. Three Flood Statements (FLSs) were issued for 10 counties in Northwest Indiana to cover this flood threat.

The third significant rainfall event occurred from August 27 to August 30 when several bouts of thunderstorms occurred along a slow moving cold front. Rainfall totals averaged 1.77 inches (COOP Data) across the Western Lower Great Lakes Region. Soil moisture continued to build up across the area and this event provided enough rain to cause flooding over parts of Northern Indiana and Northwest Ohio. Minor flooding occurred along the St.

Marys and Kankakee Rivers. Low area and small stream flooding along with flash flooding occurred across parts of Northern Indiana and Northwest Ohio. Five Flood Statements (FLSs) covering 10 counties were issued for low area and small stream flooding. Six Flash Flood Warnings (FFWs) and 5 Flash Flood Statements (FFSs) were issued for 6 counties in Northern Indiana where the flood threat escalated to flash flood threat. The worst damage occurred in Allen County Indiana on August 28 when around two and three quarter inches of rain fell in less than 2 hours on the from the Southwest to the Northwest Side of Fort Wayne. One hundred year retention ponds around Jefferson Pointe Shopping Mall in Southwest Fort Wayne filled. Rapid runoff caused flooding of a first floor apartment near Jefferson Pointe Shopping Mall. Three Flood Warnings (FLWs) and 7 Flood Statements (FLSs) were issued for the flood threat along the Kankakee, Tippecanoe and the St. Marys Rivers.

The Palmer Drought Severity Index for the period ending August 28 2004 continued the trend of increasing soil moisture. Much of Northern Indiana had unusual moist soil conditions as measured by the Palmer Drought Severity Index as August 2004 ended. The numbers are as follows: Northwest Indiana (+2.96, Unusual Moist Spell), North-Central Indiana (+3.94, Very Moist Spell), Northeast Indiana (+3.63, Very Moist Spell), Southwest Michigan (+1.70, Wet Side of Normal), South-Central Michigan (+2.57, Unusual Moist Spell), Southeast Michigan (+2.78, Unusual Moist Spell), and Northwest Ohio (+2.38, Unusual Moist Spell).

**Temperature:** For Fort Wayne, the average high temperature in August 2004 was 76.8 °F and the average low temperature was 57.6 °F. This gave an average temperature of 67.2 °F which was 3.9 °F below normal. At South Bend, the average high temperature was 76.2 °F and the average low temperature was 58.5 °F giving an average temperature of 67.3 °F which was 3.7 °F below normal for August. The warmest temperatures occurred on the 27<sup>th</sup> at Fort Wayne (87 °F) and on the 2<sup>nd</sup> at South Bend (88 °F). The coldest temperature occurred on the 12<sup>th</sup> and 16<sup>th</sup> Fort Wayne (46 °F) and on the 12<sup>th</sup> at South Bend (48 °F).

Record low maximum temperatures were recorded at Fort Wayne on August 12<sup>th</sup> (65 °F) and on August 20<sup>th</sup> (63 °F). A record low temperature was set at Fort Wayne on August 12<sup>th</sup> (46 °F). At South Bend, record low maximum temperatures were set on August 12<sup>th</sup> (67 °F), August 13<sup>th</sup> (61 °F) and on August 20<sup>th</sup> (65 °F). A record high minimum temperature was set at Fort Wayne on August 27<sup>th</sup> (76 °F). August 2004 was the 3<sup>rd</sup> coolest at Fort Wayne and the 2<sup>nd</sup> coolest at South Bend on record.

**Precipitation:** Precipitation was above normal at both Fort Wayne and at South Bend in August 2004. At Fort Wayne 5.19 inches of rain fell, 1.59 inches above normal. At South Bend, 5.62 inches of rain fell, 1.64 inches above normal. A record of 1.05 inches fell at South Bend on August 9<sup>th</sup>. August 2004 was the 8<sup>th</sup> wettest at Fort Wayne and the 11<sup>th</sup> wettest at South Bend on record.

**Weather:** August, 2004 began warmer than normal across the Western Lower Great Lakes region. High temperatures were in reached the upper 80s by the 3<sup>rd</sup>. Showers and

thunderstorms developed and moved across the area from August 3<sup>rd</sup> to August 5<sup>th</sup> along a slow moving frontal system. Tropical atmosphere dominated the Western Lower Great Lakes region at this time. With river levels low, no flooding occurred with this event even though an average of just over one inch of rain fell across the area (COOP Data). The front finally moved through the area on the 4<sup>th</sup> allowing Maritime Polar Air to overspread the region. High temperatures fell into the low to mid 70s by the 4<sup>th</sup>. Temperatures averaged 2.5 °F above normal from the 1<sup>st</sup> through the 4<sup>th</sup>.

High temperatures remained in 70s through the 8<sup>th</sup>. Warmer air began filtering north into the region on the 9<sup>th</sup> allowing high temperatures to return to the lower 80s. The warming trend was short lived as a stronger cold front moved across the area from the northwest causing scattered rain showers and some thunderstorms on the 9<sup>th</sup> and 10<sup>th</sup>. Rainfall averaged just over a quarter of an inch (COOP Data). No flooding occurred with this cold frontal passage. High temperatures were driven down into the upper 60s and lower 70s by the 10<sup>th</sup>. High temperatures remained in that range until the 14<sup>th</sup>, when a slow warming trend began. Several low temperature records fell during this time period.

August 15<sup>th</sup> saw high temperatures move back into the low to mid 70s. High temperatures made their way back into the lower 80s by August 17. A cold front stalled across the area on the 18<sup>th</sup> leading to a prolonged rain event lasting until August 21<sup>st</sup>. Rainfall totals averaged just over 2 inches (COOP Data). With increasing soil moisture, river levels rose in some areas, but with the long duration of the event and extensive vegetation growth, river levels remained well below flood stage. There were some localized flooding threats with the heavier rains. (Flood information is covered in the Overview Section.) High temperatures were pushed down into the 60s by the 20<sup>th</sup>. More low temperature records fell on that date. Temperatures average about 7.0 °F below normal from the 4<sup>th</sup> through the 23<sup>rd</sup>.

The front was pushed north of the Western Lower Great Lakes region by August 22<sup>nd</sup> allowing Maritime Tropical air to return. High temperatures rose into the upper 70s on August 22<sup>nd</sup>, reaching the lower 80s by the 23<sup>rd</sup>. The frontal system, never too far north, and weak disturbances moving along it caused more rain showers and thunderstorms. From August 24 to August 27 an average of just over a half inch (COOP Data) fell. A Flood Watch was issued to cover a flood threat on August 25. No flooding resulted from this rainfall. Temperatures averaged 6.1 °F above normal from August 24 to 28.

Stronger weather disturbances interacted with the front from August 27 to August 30 causing heavier rains. An average of around one and two thirds of an inch (COOP Data) fell from the 27<sup>th</sup> to the 30<sup>th</sup>. With soil moisture nearing saturation in some areas, this event led to flooding along the St. Marys and the Kankakee Rivers. Some areas that received excessive rainfall had a flash flood threat. (Flooding is covered in the General Overview Section.)

The frontal boundary finally moved through the area on the 29<sup>th</sup> allowing cooler air to overspread the Western Lower Great Lakes region. High temperatures were again driven down into the upper 60s on the 29<sup>th</sup>. August finished with a warming trend as high

temperatures rebounded back into the upper 70s. Temperatures averaged 3.2 °F below normal from August 28<sup>th</sup> through August 31<sup>st</sup>.

River levels as of September 5, 2004 were in the normal to above normal range for the most part. One location in Northwest Ohio had below normal flows.

**For August 2004**, Daily River and Lake Summaries (RVDs) and the Daily Hydrologic Summaries (RVAs) were issued as usual. Four Hydrologic Outlooks (ESFs) were issued to disseminate probabilistic forecast numbers associated with the Advanced Hydrologic Prediction Service (AHPS). The three river basins having AHPS service are the Kankakee River Basin in Northwest Indiana, the Maumee River Basin in Northeast Indiana and Northwest Ohio as well as the St. Joseph River Basin in Northern Indiana and Extreme Southern Lower Michigan. Only the Upper Wabash River Basin does not have AHPS probabilistic forecasts.

Six Flash Flood Warning (FFWs) covering 9 counties were issued in August 2004. Five Flash Flood Statements (FFSs) were issued in August 2004 to follow up on the Flash Flood Warnings. Eight Flood Statements (FLSs) were issued for 20 counties to address urban and small stream flooding in August 2004. Fourteen Hydrologic Statements (RVSs) were issued to disseminate river forecasts in August 2004. Three Flood Warnings (FLWs) were issued for river flooding. Seven Flood Statements (FLSs) were issued for river flooding. One Flood Watch (FFA) was issued for flood threat in late August 2004.

All temperature data used is NWS Fort Wayne and South Bend data only.

**MONTHLY REPORT OF RIVER AND FLOOD CONDITIONS**

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

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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).

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

**General Overview:** September 2004 broke the trend set in June with below normal precipitation and above normal temperatures across Northern Indiana, Northwest Ohio and Extreme Southern Lower Michigan. Precipitation averaged 1.96 inches below normal. Temperatures averaged 2.2 °F above normal. (Only NWS Fort Wayne and South Bend data were used).

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

There were three significant rainfall events in September 2004 across the Western Lower Great Lakes Region.

The first event extended from September 2 to September 4 when a weak cold front moved across the area. Thunderstorms produced heavy rain across parts of Northern Indiana and Northwest Ohio. An average of 0.63 inches of rain fell across the area (COOP Data). Flash flood warnings were issued for White County in Indiana on the morning of the 3<sup>rd</sup> when the thunderstorms with very heavy rain developed across the county. Later the warning was re-issued and included a report that 5 inches of rain fell at the Monon Fire Department. Monon is located in Northwest White County. Flooding affected a car dealership and a trailer park in Monon with the flooding continuing 2 hours after the report was received. Cars were reported floating at the dealership

The front continued moving slowly across Northern Indiana through the day and caused more thunderstorms with very heavy rain to develop across parts of Northeast Indiana and Northwest Ohio that evening. The heaviest rain fell across the Fort Wayne Metropolitan Area and in Van Wert and Allen Counties in Northwest Ohio. Smith Field, near Fort Wayne, reported 2.56 inches on the evening of September 3. Flash Flood Warnings were issued for Central Allen County in Indiana, including the Fort Wayne Metropolitan area

and for Van Wert and Allen Counties in Northwest Ohio. Roads were flooded in Southeast Van Wert County and in parts of Allen County in Ohio. Flooded streets were also reported in Fort Wayne as underpasses and a few roads flooded. Spy Run Creek rose out of its banks in Fort Wayne and crested at 8.88 feet at 11:28 PM EST on September 3rd. Flood Stage is 8 feet. Two Flood Statements (FLSs) were issued to cover small stream and creek flooding for 4 counties during this event.

The water in Northwest Ohio was slow to recede. Poor drainage caused the Little Auglaize River to flood in Putnam County on the evening of the 4<sup>th</sup> and a Flood Warning was issued to cover the flooding around and near Ottoville. State Route 190 was affected by flood water and Township Road 23 was closed by flood water. The water receded by morning of the 5<sup>th</sup>.

The second most significant rainfall event occurred from September 28 through September 30 when an upper low pressure system developed along a cold front. This system produced an average of 0.44 inches of rainfall across the area (COOP Data), with the greatest amounts falling in Northwest Ohio and Northeast Indiana. There was a 20 day lull in significant rainfall causing soil moisture to become depleted, so no flooding resulted from this rain.

The third most significant rainfall event occurred from September 6 through September 8 when an average of 0.41 inches of rain fell across the area (COOP Data) Rainfall was too scattered to cause any river flooding, and was not heavy enough to cause any areal flooding.

The Palmer Drought Severity Index for the period ending September 25, 2004 showed a reversal in soil moisture trend with significant decreases through the month. The numbers are as follows: Northwest Indiana (+1.44, Moist Side of Normal), North-Central Indiana (+2.50, Unusual Moist Spell), Northeast Indiana (+2.58, Unusual Moist Spell), Southwest Michigan (+0.12, Normal), South-Central Michigan (+0.75, Normal), Southeast Michigan (+1.27, Moist side of Normal), and Northwest Ohio (+1.76, Moist Side of Normal).

**Temperature:** For Fort Wayne, the average high temperature in September 2004 was 77.9 °F and the average low temperature was 53.5 °F. This gave an average temperature of 65.7 °F which was 1.6 °F above normal. At South Bend, the average high temperature was 77.5 °F and the average low temperature was 54.7 °F giving an average temperature of 66.1 °F which was 2.7 °F above normal for September. The warmest temperatures occurred on the 23<sup>rd</sup> at Fort Wayne (87 °F) and on the 5<sup>th</sup>, 15<sup>th</sup> and 23<sup>rd</sup> at South Bend (85 °F). The coldest temperature occurred on the 30<sup>th</sup> at both Fort Wayne (37 °F) and South Bend (38 °F).

September 2004 was the 12<sup>th</sup> warmest on record at South Bend.

**Precipitation:** Precipitation was below normal at both Fort Wayne and at South Bend in September 2004. At Fort Wayne 1.75 inches of rain fell, 1.06 inches below normal. At South Bend, 0.93 inches of rain fell, 2.86 inches below normal.

September 2004 was the 5<sup>th</sup> driest on record at South Bend.

**Weather:** September, 2004 began warmer than normal across the Western Lower Great Lakes region. September began with high temperatures in the lower 80s. A weak cold front then crossed the Western Lower Great Lakes Region from the 2<sup>nd</sup> through the 4<sup>th</sup> producing scattered showers and thunderstorms across parts of the area. Some of the thunderstorms produced very heavy rain in some locations which led to flooding and flash flooding. **Flooding is covered in the General Overview Section.** High temperatures fell into the upper 70s on the 3<sup>rd</sup>, but rebounded into the mid 80s by the 5<sup>th</sup>.

Another cold front crossed the area on the 6<sup>th</sup> and 7<sup>th</sup> causing more showers, however no flooding occurred with this event. High temperatures were pushed into the lower 70s and upper 60s by the 8<sup>th</sup>. Temperatures averaged 4.2 °F above normal for the first 7 days of the month.

There was a short 3 day break in the warm weather as a cool Canadian High crossed to the north of the region. High temperatures remained in the 70s through the 10<sup>th</sup>. Temperatures averaged 1.9 °F below normal for this time period. Little rain fell as well.

Warmer air then began moving into the Western Lower Great Lakes Region on the 11<sup>th</sup> driving high temperatures back into the lower 80s. Highs reached the middle 80s by the 13<sup>th</sup>. Maritime Tropical air dominated the area. Another cold front approached the area from the northwest on the 16<sup>th</sup> dropping high temperatures into the lower 70s across the region by the 17<sup>th</sup>. From the 11<sup>th</sup> through the 16<sup>th</sup>, temperatures averaged 6.4 °F above normal. Scattered rain showers fell across the area from the 15<sup>th</sup> through the 17<sup>th</sup>, but amounts were well short of amounts needed to cause any flooding.

The cold frontal passage led to another 3 day cool period lasting from the 17<sup>th</sup> to the 19<sup>th</sup> as high temperatures remained in the 70s. High temperatures averaged 1.8 °F below normal for the 3 days.

The Canadian high which caused the cool weather passed across the area and was far enough east of the region by the 20<sup>th</sup> to allow another warm up to begin. High temperatures again rose into the lower 80s on the 21<sup>st</sup> reaching the middle to upper 80s by the 23<sup>rd</sup>. Another cold front moved through the area by the 24<sup>th</sup> dropping high temperatures into the 70s by the 25<sup>th</sup>. High temperatures averaged 3.7 °F above normal from September 20 to September 27.

The first front passed through the area dry, but a secondary front pushed a reinforcing shot of cold air through on the 28<sup>th</sup> dropping high temperatures into the lower to middle 60s. An upper level low developed along this front over Southern Lower Michigan causing rain to develop. Rainfall was significant across parts of Northeast Indiana, South - Central Lower Michigan and Northwest Ohio. Some locations in Northwest Ohio reported between 1.5 and 1.75 inches of rain in this event. Locations in Northeast Indiana reported over an inch. There was no flooding as the dry soil soaked up the rain water.

High temperatures from the 28<sup>th</sup> to the end of September remained in the 60s and lower 70s. Temperatures averaged 4.2 °F below normal.

River levels as of September 5, 2004 ranged from above normal to blow normal for early October. Below normal flows were found in the St. Joseph River and Kankakee River Basins which covers Northwest and North - Central Indiana and Southwest and South - Central Lower Michigan. Above normal flows were found in the Maumee River and the Upper Wabash River Basins which covers North Central and Northeast Indiana and Northwest Ohio.

**For September 2004**, Daily River and Lake Summaries (RVDs) and the Daily Hydrologic Summaries (RVAs) were issued as usual. Four Hydrologic Outlooks (ESFs) were issued to disseminate probabilistic forecast numbers associated with the Advanced Hydrologic Prediction Service (AHPS). The three river basins having AHPS service are the Kankakee River Basin in Northwest Indiana, the Maumee River Basin in Northeast Indiana and Northwest Ohio as well as the St. Joseph River Basin in Northern Indiana and Extreme Southern Lower Michigan. Only the Upper Wabash River Basin does not have AHPS probabilistic forecasts.

Four Flash Flood Warning (FFWs) covering 5 counties were issued in September 2004. Four Flash Flood Statements (FFSs) were issued in September 2004 to follow up on the Flash Flood Warnings. Two Flood Statements (FLSs) were issued for 4 counties to address urban and small stream flooding in September 2004. Three Hydrologic Statements (RVSs) were issued to disseminate river forecasts in September 2004. One Flood Warnings (FLW) was issued for areal flooding. Two Flood Statements (FLSs) were issued for areal flooding. Two Flood Statements (FLSs) were also issued to cover river flooding from late August 2004.

All temperature data used is NWS Fort Wayne and South Bend data only.

**MONTHLY REPORT OF RIVER AND FLOOD CONDITIONS**

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

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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).

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

**General Overview:** October 2004 was warmer and drier than normal over Northern Indiana, Northwest Ohio and Extreme Southern Lower Michigan. Precipitation averaged 1.10 inches below normal. Temperatures averaged 0.3 °F above normal. (Only NWS Fort Wayne and South Bend data were used).

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

There were no real significant rain events in the month. The three rainfall events with the greatest amounts occurred from October 12 to October 17 (average 0.46 inches) (COOP Data), October 18 to October 20 (average 0.44 inches) (COOP Data) and October 23 to October 25 (average 0.44 inches) (COOP Data). Rainfall durations were so long in these events that no flooding resulted from the rain.

The Palmer Drought Severity Index for the period ending October 30, 2004 showed slight recharging of soil moisture toward the end of the month. The numbers are as follows: Northwest Indiana (+1.23, Moist Side of Normal), North-Central Indiana (+2.21, Unusual Moist Spell), Northeast Indiana (+2.28, Unusual Moist Spell), Southwest Michigan (+0.44, Normal), South-Central Michigan (+1.18, Moist Side of Normal), Southeast Michigan (+1.55, Moist Side of Normal), and Northwest Ohio (+2.40, Unusual Moist Spell).

**Temperature:** For Fort Wayne, the average high temperature in October 2004 was 63.5 °F and the average low temperature was 42.3 °F. This gave an average temperature of 52.9 °F which was 0.5 °F above normal. At South Bend, the average high temperature was 62.0 °F and the average low temperature was 42.5 °F giving an average temperature of 52.2 °F which was 0.1 °F above normal for October. The warmest temperatures occurred on the 7<sup>th</sup> at Fort Wayne (78 °F) and on the 29<sup>th</sup> at South Bend (76 °F). The coldest temperatures occurred on the 3<sup>rd</sup>, 5<sup>th</sup> and 17<sup>th</sup> at Fort Wayne (32 °F) and on the 5<sup>th</sup> at South

Bend (29 °F). The record for the coldest temperature on October 5<sup>th</sup> was broken at South Bend when the temperature fell to 29 °F.

**Precipitation:** Precipitation was below normal at both Fort Wayne and at South Bend in October 2004. At Fort Wayne 1.73 inches of rain fell, 0.90 inches below normal. At South Bend, 1.97 inches of rain fell, 1.30 inches below normal.

**Weather:** October, 2004 began with normal temperatures. Highs were in the lower 70s and lows in the lower 40s. Temperatures quickly fell below normal on the 2<sup>nd</sup> as a cold front pushed across the area from the northwest. The front produced light rain showers with an average of 0.09 inches across the area (COOP Data). Cool Canadian high pressure caused high temperatures to fall into the low to middle 60s on the 2<sup>nd</sup>. A secondary cold front moved across the area on the 2<sup>nd</sup> allowing a reinforcing shot of cooler air to settle across the region. High temperatures were driven into the upper 50s/lower 60s on the 4<sup>th</sup>. Low temperatures fell into the upper 20s to lower 30s on the 5<sup>th</sup> causing widespread frost across the area. Record cold was recorded at South Bend on the 5<sup>th</sup> as a low temperature of 29 °F was recorded. The Canadian high pressure retreated to the east late on the 5<sup>th</sup> allowing warmer air to return to the western lower Great Lakes region. High temperatures on the 6<sup>th</sup> reached the lower 70s across the Western Lower Great Lakes Region. The temperature averaged 6.2 °F below normal from the 1<sup>st</sup> through the 6<sup>th</sup>.

Warmer air continued its trek northward pushing high temperatures into the mid to upper 70s by the 7<sup>th</sup>. Highs remained in the upper 60s to the middle 70s across the area through the 8<sup>th</sup> before another shot of cold air approached the region as a cold front pushed through. The front caused scattered rain showers. The amounts were, again light averaging 0.11 inches across the region (COOP Data) from the 8<sup>th</sup> through the 9<sup>th</sup>. Temperatures averaged 5.5 °F above normal on the 7<sup>th</sup> and 8<sup>th</sup>.

Cooler Maritime Polar air quickly spilled across the Great Lakes region on the 9<sup>th</sup> driving high temperatures back into middle 60s and down into the upper 50s by the 13<sup>th</sup>. This was the initial shot of cold air as a series of cold high pressure systems moved across the region from Canada. Warmer air moved back into the area on the 14<sup>th</sup> pushing highs back into the lower 60s. Another cold front then pushed across the area on the 15<sup>th</sup> dropping high temperatures into the lower 50s and into the middle to upper 40s on the 16<sup>th</sup>. There were periods of rain showers from the 12<sup>th</sup> through the 17<sup>th</sup> with an average of 0.46 inches falling across the region (COOP Data). High temperatures remained in the upper 40s/lower 50s range from the 17<sup>th</sup> to the 19<sup>th</sup>. Another cold front brought reinforcing cold air and more scattered rain showers to the area. An average of 0.44 inches fell across the area from the 18<sup>th</sup> through the 20<sup>th</sup> (COOP Data). Temperatures averaged 4.4 °F below normal from the 9<sup>th</sup> through the 21<sup>st</sup> of the month.

Warm air began moving back into the Western Lower Great Lakes on the 22<sup>nd</sup> with high temperatures rising back into the 60s. The advance of the warm air was accompanied by rain showers which spread across the area on the 23<sup>rd</sup>. An average of 0.44 inches of rain fell from the 23<sup>rd</sup> to the 25<sup>th</sup> (COOP Data). Amounts were not enough to produce any type of flooding. Temperatures remained in the 60s but there was a shift in the upper level wind

pattern which allowed Maritime Tropical air masses to invade the area. High temperatures rose into the lower 70s by the 25<sup>th</sup>. Another cold front passed through the region on the 25<sup>th</sup> but there was little cold air behind it. High temperatures only dropped into the upper 60s on the 26<sup>th</sup>. High temperatures remained in the 60s through 28<sup>th</sup> before warm air again invaded the area from the south sending high temperatures into the 70s. This advance of warm air was accompanied more scattered rain showers and but amounts were quite light with an average of 0.06 inches across the area (COOP Data).

A stronger cold front moved through the Western Lower Great Lakes region on the 30<sup>th</sup> with more rain showers. Amounts were higher with an average of 0.33 inches across the area. Again no flooding occurred with this rain. From the 22<sup>nd</sup> through the end of October, temperatures averaged 9.2 °F above normal.

River levels as of November 2, 2004 were in the normal to above normal range across Northern Indiana, Northwest Ohio and Extreme Southern Lower Michigan. There were isolated pockets of below normal flows in Northern Indiana and Extreme Southern Lower Michigan.

**For October 2004**, Daily River and Lake Summaries (RVDs) and the Daily Hydrologic Summaries (RVAs) were issued as usual. One Hydrologic Outlook (ESF) was issued to disseminate probabilistic forecast numbers associated with the Advanced Hydrologic Prediction Service (AHPS) for the Maumee River Basin.

No flooding occurred in the area in October, 2004 so no Flood/Flash Flood Warnings/ Statements/Watches (FFWs/FLWs/FFSs/FLSs/FFAs) were issued.

All temperature data used is NWS Fort Wayne and South Bend data only.

**MONTHLY REPORT OF RIVER AND FLOOD CONDITIONS**

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

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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).

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

**General Overview:** November 2004 was warmer and wetter than normal over Northern Indiana, Northwest Ohio and Extreme Southern Lower Michigan. Precipitation averaged 0.79 inches above normal. Temperatures averaged 2.6 °F above normal. (Only NWS Fort Wayne and South Bend data were used).

For the month of November, the average high temperature was in the lower 50s, 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).

The three most significant precipitation events in November 2004 occurred on November 1st through November 5<sup>th</sup>, from November 11<sup>th</sup> through November 21<sup>st</sup> and from November 24<sup>th</sup> through November 28<sup>th</sup>.

The first one occurred from November 1<sup>st</sup> to November 5<sup>th</sup> when an average on 1.00 inch of rain fell across the Western Lower Great Lakes region (COOP Data) through the 4th. (Data for November 5<sup>th</sup> is presently unavailable.) The rainfall led to some rises on area rivers, but all remained well below flood stage.

The second significant precipitation event occurred from November 14<sup>th</sup> to November 21<sup>st</sup> 2004 when an average of 0.88 inches of rain fell across the area (COOP Data). The precipitation occurred over a period of one week which did little to cause any response on the rivers, in fact the rivers continued to fall through that time.

The third significant precipitation event occurred from November 24<sup>th</sup> to November 28<sup>th</sup> 2004. It also happened to be the first significant snowfall event across the region. Five to seven inches of snow fell across parts of Southern Michigan and Northern and Northwest Indiana with lesser amounts over Northeast Indiana and Northwest Ohio. All of the snow fell on November 24<sup>th</sup>. Snow amounts ranged from 7 inches at Medaryville Indiana to around a half inch at Wauseon in Northwest Ohio. The snow was preceded by moderate to

heavy rain across much of the area. Many areas reported total liquid amounts of between 1 and 1.4 inches (COOP Data). The rivers in Northern Indiana, Extreme Southern Michigan and Northwest Ohio did have a significant response to the precipitation. River levels rose about 2 feet across Northwest Indiana and Extreme Southwest Lower Michigan to as much as 13 feet in Northeast Indiana. However all remained below flood stage!!! The initial rises were greatest in areas that had most of the precipitation fall as rain. These areas were concentrated in Northeast Indiana and Northwest Ohio. In addition, rivers tend to rise higher and faster in these areas where hydrosopic soil types dominate.

Much of the snow melted by the 28<sup>th</sup> as more rain fell on the 26<sup>th</sup> and 27<sup>th</sup>. The additional precipitation plus the snowmelt slowed the recession from the initial rise that began on the 25<sup>th</sup>. River flows remained high to the end of November. Precipitation totaled 1.80 inches of liquid from November 24<sup>th</sup> to November 28<sup>th</sup>.

The Palmer Drought Severity Index for the period ending December 4, 2004 showed significant moistening of area soils with many areas indicating excessively wet conditions. The numbers are as follows: Northwest Indiana (+3.16, Very Moist Spell), North-Central Indiana (+3.85, Very Moist Spell), Northeast Indiana (+3.46, Very Moist Spell), Southwest Michigan (+2.23, Unusual Moist Spell), South-Central Michigan (+2.76, Unusual Moist Spell), Southeast Michigan (+2.77, Unusual Moist Spell), and Northwest Ohio (+3.23, Very Moist Spell).

**Temperature:** For Fort Wayne, the average high temperature in November 2004 was 51.0 °F and the average low temperature was 35.9 °F. This gave an average temperature of 43.5 °F which was 2.9 °F above normal. At South Bend, the average high temperature was 49.4 °F and the average low temperature was 35.4 °F giving an average temperature of 42.4 °F which was 2.3 °F above normal for November. The warmest temperatures occurred on the 7<sup>th</sup> and the 18<sup>th</sup> at Fort Wayne (64 °F) and on the 6<sup>th</sup> at South Bend (63 °F). The coldest temperatures occurred on the 14<sup>th</sup> at Fort Wayne (22 °F) and on the 13<sup>th</sup> at South Bend (23 °F). November 2004 was the 15<sup>th</sup> warmest at Fort Wayne and tied for 16<sup>th</sup> warmest with 1974 at South Bend on record.

**Precipitation:** Precipitation was above normal at both Fort Wayne and at South Bend in November 2004. At Fort Wayne 3.39 inches of rain fell, 0.41 inches above normal. At South Bend, 4.56 inches of rain fell, 1.17 inches above normal. The record for the most precipitation and snowfall for November 24<sup>th</sup> fell as 0.54 inches of precipitation and 5.0 inches of snow fell. November 2004 was the 8<sup>th</sup> wettest on record at South Bend. At Fort Wayne, 1.8 inches of snow fell, 1.2 inches below normal. At South Bend, 5.0 inches of snow fell, 2.7 inches below normal.

**Weather:** November began warm and wet with high temperatures in the lower to middle 50s on the 1<sup>st</sup>. High temperatures rose in the lower 60s at Fort Wayne on the 2<sup>nd</sup>, but remained in the lower to middle 50s through the 5<sup>th</sup>. A Modified Maritime Polar air mass dominated the area through this time period. Periods of rain fell across the area as a series of weather disturbances passed across.

A warmer Maritime Tropical air mass replaced the cooler one on the 6<sup>th</sup> driving high temperatures into the lower 60s. The warm air was quickly replaced again, by a cooler Maritime Polar air mass on the 8<sup>th</sup> dropping high temperatures into the mid to upper 40s. The warm air returned on the 10<sup>th</sup> driving high temperatures back into the lower 60s.

The cooler air chased out the warm air mass on the 11<sup>th</sup> dropping high temperatures back into the lower 50s and down into the middle 40s by the 12<sup>th</sup>. Little precipitation occurred with these air mass changes. Temperatures averaged 1.6 °F above normal from the 1<sup>st</sup> through the 11<sup>th</sup>.

The cooler air mass (Maritime Polar) stayed from 12<sup>th</sup> through the 15<sup>th</sup> with high temperatures in a range from the mid 40s to around 50 °F. Low temperatures were in the 20s through the period. Little precipitation fell. Temperatures averaged about 4.2 °F below normal.

Warmer air again replaced the cooler air driving high temperatures back into the lower 60s by 18<sup>th</sup>. The warm air advance was accompanied by periods of rain from the 14<sup>th</sup> through the 21<sup>st</sup>. The rain fell over a period of a week and as a result did not cause any flooding.

Cooler air (Maritime Polar) moved back into the Western Lower Great Lakes region on the 19<sup>th</sup> beginning a slow drop in high temperatures for the remainder of November. High temperatures fell into the 50s on the 19<sup>th</sup> and into the 40s by the 22<sup>nd</sup>. There was a brief warm up with high temperatures rising back into the lower 50s by the 23<sup>rd</sup>. Temperatures averaged around 10.4 °F above normal from the 16<sup>th</sup> through the 23<sup>rd</sup>.

The trend toward colder temperatures resumed on the 24<sup>th</sup> with high temperatures falling back into the 40s. A period of wet weather commenced on the 24<sup>th</sup> bringing the first significant snowfall to the area. Snows of 7 inches were found across parts of Northern Indiana and Southwest Lower Michigan on the 24<sup>th</sup>. Winter storm warnings and winter weather advisories were issued for affected areas. The entire region received some snow with the storm system but amounts were much less over parts of Northeast Indiana and Northwest Ohio. The snow was preceded by significant rainfall so the entire area received an average liquid amount of around one inch (COOP Data).

However, daytime high temperatures remained above freezing through the rest of the month and with more rain falling on the 26<sup>th</sup> and 27<sup>th</sup>, the snow cover completely melted. Another storm system passed across the area from the 29<sup>th</sup> through December 1<sup>st</sup> bringing an average of just over a half inch liquid across the area. Some of the precipitation fell as snow across Northwest Indiana and Southwest Lower Michigan. Snow amounts were in the 1 to 2 inch range. Temperatures averaged 0.4 °F below normal from November 24<sup>th</sup> to November 30<sup>th</sup>. At the end of November, snow cover ranged from 2 inches over parts of Southwest Lower Michigan to 1 inch over far Northeast Indiana. Elsewhere amounts were a trace or no snow cover.

River levels as of December 13, 2004 were in the above to much above normal range across Northern Indiana, Northwest Ohio and Extreme Southern Lower Michigan.

**For November 2004**, Daily River and Lake Summaries (RVDs) and the Daily Hydrologic Summaries (RVAs) were issued as usual. 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) and Kankakee River Basins. Seven Hydrologic Statements (RVSSs) were issued to cover high flows on rivers in the Maumee, Upper Wabash and Kankakee River Basins in November 2004.

No flooding occurred across the area in November, 2004 so no Flood/Flash Flood Warnings/ Statements/Watches (FFWs/FLWs/FFSs/FLSs/FFAs) were issued.

All temperature data used is NWS Fort Wayne and South Bend data only.

**MONTHLY REPORT OF RIVER AND FLOOD CONDITIONS**

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

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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).

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

**General Overview:** December 2004 was warmer and drier than normal over Northern Indiana, Northwest Ohio and Extreme Southern Lower Michigan. Precipitation averaged 0.49 inches below normal. Snowfall averaged 1.8 inches above normal. Temperatures averaged 0.3 °F above normal. (Only NWS Fort Wayne and South Bend data were used).

For the month of December, 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 three significant precipitation events in December 2004. The first two events were rain events and the last one a snow event. The first event commenced on December 5<sup>th</sup> and ended on December 8<sup>th</sup>. An average of 1.19 inches of rain fell across the area (COOP Data). The rains caused river levels to rise across parts of Northeast Indiana and Northwest Ohio. Minor flooding occurred along the Tiffin River in Northwest Ohio and the Eel River in Northeast Indiana. Other rivers in Northern Indiana and Northwest Ohio approached flood stage but remained below. Six Flood Warnings (FLWs) and 17 Flood Statements (FLSs) were issued to cover the flood threat.

The second event occurred from December 9<sup>th</sup> through December 14<sup>th</sup>. Again it was a rain event with an average of 0.34 inches across the area (COOP Data). The rain prolonged the flood along the Tiffin River. However other rivers and streams remained below flood stage.

The third event was a snow event, began on December 22<sup>nd</sup> and ended on December 26<sup>th</sup>. An average of 6.2 inches of snow fell across the area (COOP Data) with the most snow falling across parts of Northeast Indiana and Northwest Ohio. Ridgeville in Far East Central Indiana reported 13 inches of snow while Hartford City in Northeast Indiana reported 9 inches. Much higher amounts fell across Southern and Central Indiana and much of Central and Eastern Ohio.

**Soil Moisture:** Soils continued to moisten, even with below normal precipitation totals for the month. The Palmer Drought Severity Index for the period ending January 1, 2005 showed high soil moisture levels prevailing across the area with North Central Indiana showing excessively wet conditions. The numbers are as follows: Northwest Indiana (+3.25, Very Moist Spell), North-Central Indiana (+4.05, Extremely Moist Spell), Northeast Indiana (+3.71, Very Moist Spell), Southwest Michigan (+2.48, Unusual Moist Spell), South-Central Michigan (+3.36, Very Moist Spell), Southeast Michigan (+3.59, Very Moist Spell), and Northwest Ohio (+3.64, Very Moist Spell).

**Temperature: For Fort Wayne,** the average high temperature in December 2004 was 37.2 °F and the average low temperature was 21.0 °F. This gave an average temperature of 29.1 °F which was 0.1 °F above normal. At Fort Wayne, the warmest temperature reached in December 2004 was 60 °F on the 7<sup>th</sup> and the coldest temperature was -15 °F reached on the 25<sup>th</sup> (Christmas Day) which broke the record for the date. Another low temperature record was tied on the 27<sup>th</sup> when the temperature fell to -8 °F.

**At South Bend,** the average high temperature was 36.4 °F and the average low temperature was 22.1 °F giving an average temperature of 29.2 °F which was 0.5 °F above normal for December. The warmest temperature occurred on December 7<sup>th</sup> and December 31<sup>st</sup> (58 °F) and the coldest temperature occurred on the 27<sup>th</sup> (-3 °F) which broke the record for that date.

**Precipitation:** Precipitation was below normal at both Fort Wayne and at South Bend in December 2004. At Fort Wayne, 2.67 inches of precipitation fell, 0.10 inches below normal. Snowfall totaled 10.3 inches in December 2004 which was 2 inches above normal at Fort Wayne. At South Bend, 2.21 inches of precipitation fell, 0.88 inches below normal. Snowfall totaled 20.1 inches which was 0.9 inches above normal for December. A record was set at Fort Wayne when 8.1 inches of snow fell on the 23<sup>rd</sup>.

**Weather:** December 2004 over the Western Lower Great Lakes Region began with temperatures above normal. High temperatures ranged from the upper 30s to the middle 40s across the region with the warmer temperatures occurring over Northeast Indiana. Temperatures averaged 4.3 °F above normal from the 1<sup>st</sup> to the 18<sup>th</sup>. Maritime tropical air masses dominated the region's weather for much of the time. High temperatures remained, for the most part in the 40s through the 6<sup>th</sup> when a much warmer air mass pushed across the area ahead of a storm system to the west. High temperatures reached the upper 50s to 60 °F on the 7<sup>th</sup> in response. This storm system produced the most precipitation of any system in December producing an average of around 1.2 inches of rain. As a result, minor flooding occurred across parts of Northeast Indiana and Northwest Ohio. Cooler air followed on the 8<sup>th</sup> dropping high temperatures back into the middle 40s. Warmer air returned on the 9<sup>th</sup> ahead of another storm system developing over the Central Plains as high temperatures approached the 50 °F mark again. This storm system produced an average of only around a third of an inch of mostly rain. The precipitation did not cause any additional flooding. Colder air followed the second system dropping temperatures below normal on the 14<sup>th</sup> and 15<sup>th</sup> of December. Lake effect snows fell across parts of Northwest Indiana and Southwest

Lower Michigan. South Bend received 5.9 inches of snow on the 13<sup>th</sup> and 14<sup>th</sup>. LaPorte reported 7.3 inches with the lake effect. There was little effect on rivers and streams in that area. High temperatures dropped into the lower 30s and lower 40s on the 16<sup>th</sup>. High temperatures oscillated between the lower 30s and lower 40s through the 18<sup>th</sup>.

A significant change in the weather patterned allowed for cold air to invade the Western Lower Great Lakes Region. High temperatures plummeted into the 20s by the 19<sup>th</sup>. Low temperatures ranged from -1 °F at South Bend to 5 °F above at Fort Wayne. Warmer air briefly pushed high temperatures back into the 34 °F to 42 °F degree range on December 21st. A massive lake effect snow storm broke out on the 19<sup>th</sup> across far southwest Berrien County in Southwest Lower Michigan and LaPorte County in Northwest Indiana. Snowfall totals were as high as 26 inches in Michigan City. Amounts ranged from 8 inches over far Southwest Berrien County in Southwest Lower Michigan to 26 inches in Northeast LaPorte County. Again with the light nature of lake effect snow, there was little affect on area rivers and streams.

The third most significant precipitation event developed on the 23<sup>rd</sup> when a storm system took shape over the Gulf of Mexico and swept northeast to Ohio. Heavy snow fell over much of Northwest Ohio and Northeast Indiana on the 23<sup>rd</sup> and 24<sup>th</sup> with some locations reporting 13 inches of snow. Fort Wayne received a record 8.1 inches of snow on the 23<sup>rd</sup>. Average precipitation totaled only around a quarter of an inch (COOP Data), however much of the northwest half of the area had much less snow than parts of Northeast Indiana and Northwest Ohio. Following the snowstorm, cold air and the newly fallen snow combined to cause temperatures to plummet to their lowest levels of the season. Low temperatures fell to -14 °F at Fort Wayne and 0 °F at South Bend on December 24<sup>th</sup>. A record low temperature of -15 °F was set at Fort Wayne on December 25<sup>th</sup>. The record low temperature for Fort Wayne was tied (-8 °F) and broken at South Bend (-3 °F) on the 27<sup>th</sup>.

The weather pattern shifted again to allow warmer air to move northward across the Western Lower Great Lakes Region. High temperatures soared back into the upper 50s on the last day of December. With high temperatures rising back into the 50s, the thick snow pack melted quite rapidly. This caused significant rises on area rivers, but levels before the melting took place, receded significantly from the near flood stage levels found at some locations in early December. As a result no flooding occurred.

There was no snow on the ground as December 2004 ended.

River levels as of January 1, 2005 were well above normal across much of Northern Indiana and Northwest Ohio with lower levels, still above normal, found over Extreme Southern Lower Michigan and Northwest Indiana.

**For December 2004**, Daily River and Lake Summaries (RVDs) and the Daily Hydrologic Summaries (RVAs) were issued as usual. 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) and Kankakee River Basins. Seven Hydrologic Statements (RVSSs) were issued to cover high flows on rivers in

the Maumee, Upper Wabash and Kankakee River Basins in December 2004. Two Hydrologic Outlooks (ESFs) were issued to deal with an ice jam on the St. Joseph River in Northern Indiana. Six Flood Warnings (FLWs) were issued to cover the flooding in Northern Indiana and Northwest Ohio in early December. Seventeen Flood Statements (FLSs) were issued to cover the flood threat over Northern Indiana and Northwest Ohio. No damage reports were received concerning the flooding. Flooding occurred in low lands nearest the rivers that flooded. There was no flash flooding in December 2004.

All temperature data used is NWS Fort Wayne and South Bend data only.