# OVERLAYING HYDROLOGIC COUNTY MAP BACKGROUNDS ON SWIS

[Editor's Note: The following Central Region TA outlines procedures that allow county hydrological map backgrounds to be tailored for use in SWIS. As stated in the TA, it's necessary to have hydrological map backgrounds at your site in order to do this. The Western Region map backgrounds were mailed out to each state in 1985. Your ASM should have these diskettes on file.]

CENTRAL REGION TECHNICAL ATTACHMENT 88-8

Steven J. Hentz
National Weather Service Forecast Office
Milwaukee, Wisconsin

William J. Gery
National Weather Service Forecast Office
Indianapolis, Indiana

This paper covers the procedures necessary to overlay hydrologic county map backgrounds on SWIS. The process is not as straight forward as we would like, but it does work. In order to do it you will need the county map backgrounds in AFOS, the cooperation of your SWIS focal point, and some familiarity with PMOD. The results exceeded our original expectations.

The map backgrounds used were provided for each state by Charles Hoffeditz of the Office of Hydrology back in 1984; they came with a cover letter routed through Tom Schwein. You will also need the PMOD parameter text files (.PF) that accompanied the map backgrounds on the same floppy. Milwaukee's file was named MKENA5X.PF, Indianapolis' file was INDNA5X.PF.

The first step involves working with your SWIS focal point to determine if you will change the horizontal or vertical offset on your SWIS sectors. In MKE we started with the EB2 sector. We changed the default horizontal and vertical pixel offset values of 92,50. We chose to use 92,0 to allow us to see as far north as possible (see SWIS Operator's Manual, page 5-3, for more details).

Next you will have to adjust the image center point. If you changed the pixel offset values, the center point will also have to be changed. Even if you didn't change the offsets, the center point default value is not good enough for our needs, especially for the northern states. To get a good approximation for the new center point, move the cursor to a known latitude and longitude near your state. We used known latitude and longitudes of the state boundaries. Note the difference between the SWIS readout and what it should be. The difference will be the value you need to add or subtract from the center point in SWIS's latitude/longitude table. It is best to be in the full sector file since most routine AFOS displays will be on the full sector. Unfortunately, a common value will not be applicable to each state. This step should be done only when the satellite images are stable. You will not be able to get the readouts to match perfectly, but overlay a B03 image onto your EB2 or other sector to make sure it is "close enough." Final adjustments will be done using PMOD.

---------------------------------------------------------------------

## RESCALING THE MAP BACKGROUND

The procedure to rescale the map background to make it compatible with B03 uses a procedure originated by Phillip Bothwell of Southern Region SSD that rescales MESOS graphics to make them compatible with B02 (see Programming Tip #30 from the August, 1986, "AFOS Applications Quarterly Report"). The procedure involves creating a new parameter text file.

To build your new parameter text file, do the following:

Get the values of your hydro parameter text file, and use them to create a new parameter text file for the SWIS overlay. Our example, MKENA5X.PF, is used to create a new parameter text file, SWISNA5X.PF. Calculate the values for SWISNA5X.PF using the following procedure:

```
IOFF   = 0
JOFF   = 0
ICHRT  = 2048
JCHRT  = 1536
ISCAL  = 10000 / OLD ISCAL VALUE
ICANT  = OLD ICANT - OLD IOFF
JCANT  = OLD JOFF  - OLD JCANT
NROT   = OLD IOFF
JSTRIP = OLD JOFF
LDENS  = -10
ITLE   = 0
JTLE   = 0
```

NOTE: Some of these values will be negative.

To assist in making your new map background, create a macro, SWISNA5X.MC, containing the following:

```
HCOPY B52 SWISNA5X.PF
GENUTF XPLOT T01
```

B52 is your hydrologic county map background.
Key graphic T01 to the B03 background using the AFOS KEY: command.

Display T01. You should see your state county map background plotted at the right size and rotation; however, it will not be located where it should be. If your state does not have the proper size or rotation, you probably made a mistake in calculating the values for the SWISNA5X.PF file.

Once you've obtained an image with the proper size and rotation, we now use the good old "trial and error" method to get it where it belongs (maybe there is a simpler, more precise, approach to this; if so, please let us

know). You'll probably have to start by moving your state and counties north - this is done by adding the same negative value to both JOFF and JCANT. See how well -1000 works. To move it south, add a positive value. To move the map background farther east, add a negative number to both IOFF and ICANT. See how well -100 works. To move it west, add a positive number. NOTE: It's less confusing if you adjust only one dimension at a time.

You'll soon find the trial and error approach doesn't take that much time. Remember, however, to change both IOFF and ICANT by the same number. If you don't, you'll change the rotation. In the same way, change JCANT the same amount you change JOFF.

The following example illustrates the results of adding -650 (to move east) to IOFF and ICANT, and adding -2800 (to move north) to JOFF and JCANT.

```
        OLD SWISNA5X.PF              NEW SWISNA5X.PF

IOFF    0 ----- add -650 ----------> -650
JOFF    0 ----------- add -2800 ---> -2800
        2048                         2048
        1536                         1536
        9                            9
ICANT   179 --- add -650 ----------> -471
JCANT   -47 ---------- add -2800 ---> -2847
        1165                         1165
        653                          653
        -10                          -10
        0                            0
        0                            0
```

Don't use these numbers - they are only for Wisconsin. Yours will be different. However, the numbers -650 and -2800 do give you a good indication how much movement was necessary to get the background close to Wisconsin.

Once you've got your county background close to its proper location on the B03 background, it's time to overlay the results on SWIS. Fine tuning of the map background will be done by viewing the sub-sector file on SWIS.

On SWIS, using FULL FILE, MANUAL mode, select the desired sub-sector file, in this example, EB2.

Enter AFOS CONTROL mode (press the AFOS CONTROL button on the SWIS console, then enter SWIS: on an ADM), then transform your new map background (in this example, T01) to SWIS. Remember, in order for your graphic to be transformed correctly, it must be keyed to the B03 background.

Observe how close the counties overlay on your state. Exit AFOS CONTROL and adjust either IOFF and ICANT, or JOFF and JCANT to move the overlay closer. By this time you'll begin to get a feel for how much change is needed.

Continue this process until you get the best results. In Milwaukee, we had to make a slight rotation to make the counties overlay just right. We had to move just ICANT east by about -5 TO -10 to rotate the top to the west a very

3

small amount. This seems to conflict with the figure on top of the PMOD manual on page 3-31, but is probably due to the fact that in Milwaukee's example, IOFF and ICANT were both negative numbers.

At Indianapolis, the county map had to be stretched a little in the north-south direction. JSTRIP was increased by 3.

You can actually get the counties to overlay just about perfectly; however, the images do shift a bit from day to day. As a result we made three county map backgrounds, T04, T05, and T06. T04 is a little north and west of T05. T06 is a little south and east of T05. You may want to keep three separate macros and associated .PF files to rebuild these graphics and to make minor changes from time to time.

One word of caution. Always be on the sub-sector when transforming the graphic from AFOS to SWIS. Your overlays will be off if you set them up for the sub-sector and then transform them on the full sector.

This may seem like a lot of work, however once you see the counties almost perfectly overlaid on SWIS, you see many possibilities for better SPS's, NOW's, and ELF's.

In a future paper, we'll discuss how to transform the new Central Region zone map background to SWIS.