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SWIS AT SALT LAKE

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Satellite imagery animation will be available at all WSFOs (and other selected sites) by the end of 1987. The Satellite Weather Information System (SWIS) is the newest technological addition to the WSFO menu. The first SWIS in the Western Region was installed at WSFO Salt Lake City on February 27. This was one of 12 units deployed around the country for an initial "shake-down" phase to identify any real time problems.

Before SWIS is put into general use, we at Salt Lake City thought it might be worthwhile to share some of our experiences with the system, from an operator's viewpoint, as well as detail a few problems which have arisen.

In its most basic mode SWIS receives satellite images and stores them in one of 6 designated sector files. Other valid sectors that are not one of these six types are stored in a Floater File. These files can then be accessed for animation and limited interaction with AFOS via overlaying of graphic fields. Sectors can also reveal additional detail through viewing of automatically stored subsectors, the location of which is determined by the operator. Complete specific instructions of operation and capabilities are found in the SWIS Operations Manual (AFOS Handbook 2, Operators Handbook Volume 6).

The following is a synopsis of pluses, minuses, and notes of interest we have learned thus far with SWIS. These observations are valid as of the third week of May, but changes and modifications will occur in time.

PLUS:

a) Motion adds a whole new dimension to understanding the flow of the real atmosphere.

b) Dial code changes using the automatic (programmable) scheduler can be made as often as needed. We can take full advantage of the varied east and west sectors available.

c) Subsector size of the WC1 (4km) can approximate the WB1 (2km). This allows "duplication" of the WB1 and helps if photos are rejected. Other double coverage schemes are possible.

d) File length is adjustable allowing more space for higher priority sectors.

e) Ability to view incoming sectors gives a 6-8 minute advantage over UNIFAX.

f) There is no apparent impact on AFOS.

g) Overlay of AFOS graphics allows a 3-dimensional view of systems and makes determination of initial model states easier to evaluate.

h) AFOS graphics (non model) such as 90F, 90S, 90R, WLS (lightning data), and WSM (SIM) are particularly useful as overlays.

i) Range of looping rates and start/end pause times give a moderate amount of flexibility.

j) Extensive creativity is possible in setting enhancement coloring.

k) Looping states such as FWD, REV, and FWD/REV are useful depending upon circumstances.

l) Ability to define loops by image type (vis, IR) or enhancement curve is also very useful.

MINUS:

a) Rejected photos create variable time gaps, making for jerky motion in loops.

b) It is impossible to compose a Dial Code schedule to please everyone.

c) Hard copy is not available at this time.

d) Increased lines in subsectors make color (local) enhancement grainy in appearance.

e) Data is transmitted in analog form. Up to a 5-count variance in signal levels makes use of specific temperature thresholds in locally produced curves unreliable. See WRTA NO. 87-14.

f) A transformed AFOS graphic is usable on the particular sector on which it is overlaid (WB1, WC1, etc.) and its subsector. It is not, however, transferable to another sector. It must be transformed again.

g) Plotted data (50A, 70A, etc.) is not transformed to an overlay in a usable form (yet).

h) Due to size limitations (32 AFOS blocks) of transformable products, some common charts are too large. These include some of the NGM and most of the AVN. In-house transformation of the AVN to a North American background before shipment to SWIS solves that problem.

i) The "Graphics" file contains up to 20 overlays, but there is no way to know what they are without paging through each one individually.

j) It can take 2-5 minutes (or more) to transform larger graphic files. The particular AFOS console in use is locked during this time and cannot be used for other purposes.

k) Rejected sectors are stored in the "message" file. The fixed size of "3" is too limited at this time because of excessive photo rejection. See item "m" below.

l) Resetting SWIS will cause the incoming photo to be lost. Instructions recommend SWIS be reset whenever AFOS crashes and again when AFOS is restored. Our experience indicates that AFOS can be safely restored without first resetting SWIS (to avoid picture loss). However, it should be reset as soon as possible (between pictures) after AFOS is restarted. By not resetting SWIS before restarting AFOS, there is a very small risk that an AFOS file could be damaged.

m) SWIS is much more sensitive to line levels and interference than UNIFAX. Signal noise has resulted in an average rejection rate of 15-35%. Loops have been severely impacted. This problem is being addressed, and a solution is anticipated before SWIS is delivered to most other Western Region field sites.

n) Variation in picture registration on the screen is an annoying problem when looping. Pictures tend to occasionally jump around on the screen.

o) Occasional failure of the automatic scheduler (Dial Code changes) has been noted.

p) DWIPS and GMS sectors store in the "Message" file rather than the "Floater" file. They cannot be looped. This situation will be addressed by SFO/SFSS soon.

NOTES OF INTEREST

a) Vorticity centers and other detailed analysis points are best seen in shorter loops (2-5 frames).

b) Looping a sequence beneath an analysis is helpful to find out where systems have come from or where they are going.

c) A continuous gray scale (black to white) highlights cloud ranges best if you are not interested in specific temperature threshold values. Temperature ranges can be adjusted by season.

d) Do not strike "Display Clear" on any ADM or GDM in the console group that SWIS is operating from. Doing so will immediately terminate the SWIS session. You must restart the SWIS session on AFOS (SWIS:) if this is done.

e) SWIS images can be displayed on a GDM B-scope. Care must be taken when switching from the "A" side to "B" side in that one must pause briefly in the "standby" mode. Otherwise you will risk blowing a transistor in the GDM.

f) SWIS should not be left in a continuous (unattended) looping state. When not in use, SWIS should be left in "INCOMING FULL", "NEWEST IMAGE", or any other single frame state. Perpetual looping will shorten the life of the Winchester disks. Images are retrieved from the disk not memory.

g) Dial code changes can be made at any time but will not take effect until after the incoming image is completed. Thus, the timing of changes by the operator or automatic scheduler are not critical as it is with UNIFAX.

FUTURE AND SUMMARY:

Availability of animation to the average WSFO will be a significant step towards achieving a feel for the real atmosphere. Our ability to anticipate short-term trends and grasp larger scale motions will be significantly improved. Each WSFO will develop its own unique methods of image display, color enhancement, and AFOS graphic overlay.

Hard copy availability may some day be possible at each site, resources permitting. A hard copy device already exists. In addition, the analog variance problem can be overcome by using a direct satellite dish receiver (digital data), but this is also a matter of resources.

We hope these comments bring a bit of reality to a system that has been advertised for quite a while. Please feel free to call WSFO Salt Lake City with any additional comments or questions.