# Derived Product Imagery (DPI) case on August 9, 1996


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### 1. Introduction

**This TA-lite will look at DPI data from August 9, 1996. This is a case of strong to severe convection that occurred in eastern Montana, eastern Wyoming, and western South Dakota. We will look at GOES-9 imager lifted index (IMLI) and imager total precipitable water (IMPW) to see if it could be used to identify regions prone to convection.**

### 2. Discussion of DPI data

**We will look at the imager LI DPI and imager PW DPI to see if there is any signature that will indicate that convection is likely in this area. The 09Z IMPW DPI shows a gradient of moist (red and yellow) to dry (blue and brown) from east to west across South Dakota, Wyoming, and Montana. An maximum of 0.75-1.00 in PW is seen in central South Dakota. At 12Z the IMPW shows generally the same pattern with a slight northward advance of the moisture maximum that is centered in central South Dakota. The 15Z IMPW DPI shows moisture increasing along a southeast to northwest line from central South Dakota to northeast Montana. This image also shows an increase of moisture in northeast Wyoming. Finally, the 18Z IMPW DPI shows even more moist along the line from central South Dakota to northeast Montana. Also, moisture has increased greatly in eastern Wyoming at this time.**

**We will now look at the imager LI DPI. At 09Z the IMLIshows an area of more unstable air (1C to -3C) in central South Dakota. By 12Z the IML shows that the stability has changed little since 09ZZ. The 15Z IMLI DPI shows a increase in the areal extent of the unstable region, which now extends into eastern Montana. Finally, the 18Z IMLI DPI shows rapid destabilization in southeast Montana, eastern Wyoming, and western South Dakota. Values of LI have decreased to as low as -7C in western South Dakota.**

**Mpeg movies from 03Z-18Z are available: IMPW loop, IMLI loop.**

### 3. Discussion of other imagery and relation to DPI data

**The 2 km VIS data clearly shows this convection developing quite clearly. Click here for an mpeg loop of the 2 km VIS. We can see that the convection developed along the axis of higher moisture and instability that existed from**

**central South Dakota to eastern Montana. Then as moisture fed into eastern Wyoming and destabilization occurred the convection began in that region.**

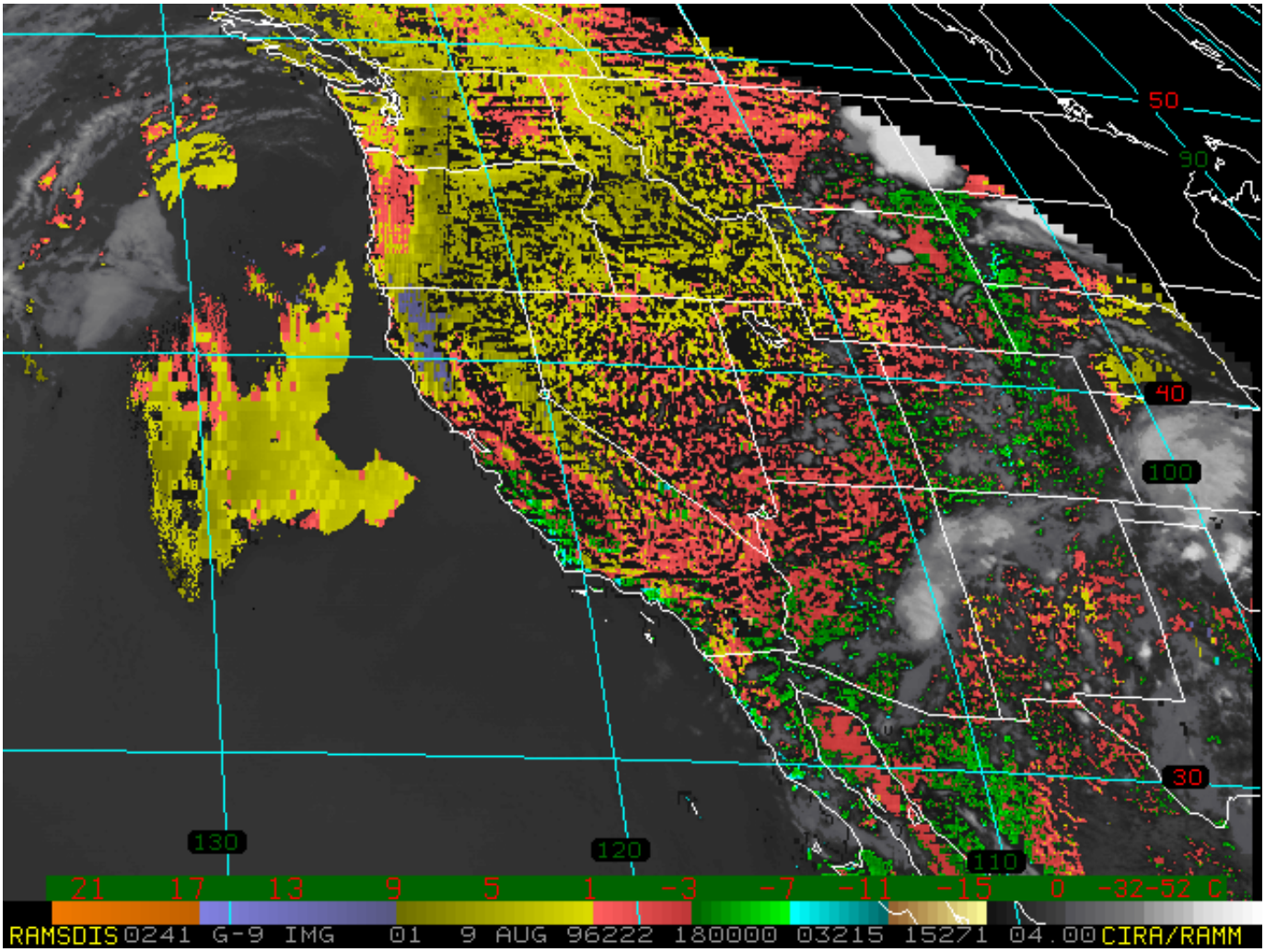
**4. Summary of convective activity**

**On this day strong to severe convection first developed in eastern Montana and northern South Dakota at about 1500Z. Additional convection began to form in eastern Wyoming by 1800Z. At 1655Z WSO Glasgow issued a Special Weather Statement for strong thunderstorms in northeast McCone County 20 miles south of Wolf Point. Billings WSO issued a Special Weather Statement for strong thunderstorms in Prairie and Wibaux counties at 1721Z. At 1817Z the Billings WSO issued a Severe Thunderstorm Warning for southeastern Prairie County in southeast Montana valid until 1815Z for a thunderstorm 33 miles northeast of Miles City. At 1947Z WSO Billings issued a Severe Thunderstorm Warning for northern Carter County and Fallon Co in southeast Montana valid until 2045Z. At 2030Z Billings issued a Severe Thunderstorm Warning for southeastern Sheridan County in northern Wyoming valid until 2115Z. Finally, at 2049Z WSO Billings issued a Severe Thunderstorm Warning for northern Carter County in southeast Montana valid until 2150Z.**

**The main significant weather associated with all these storms was dime-sized hail and gusty winds.**

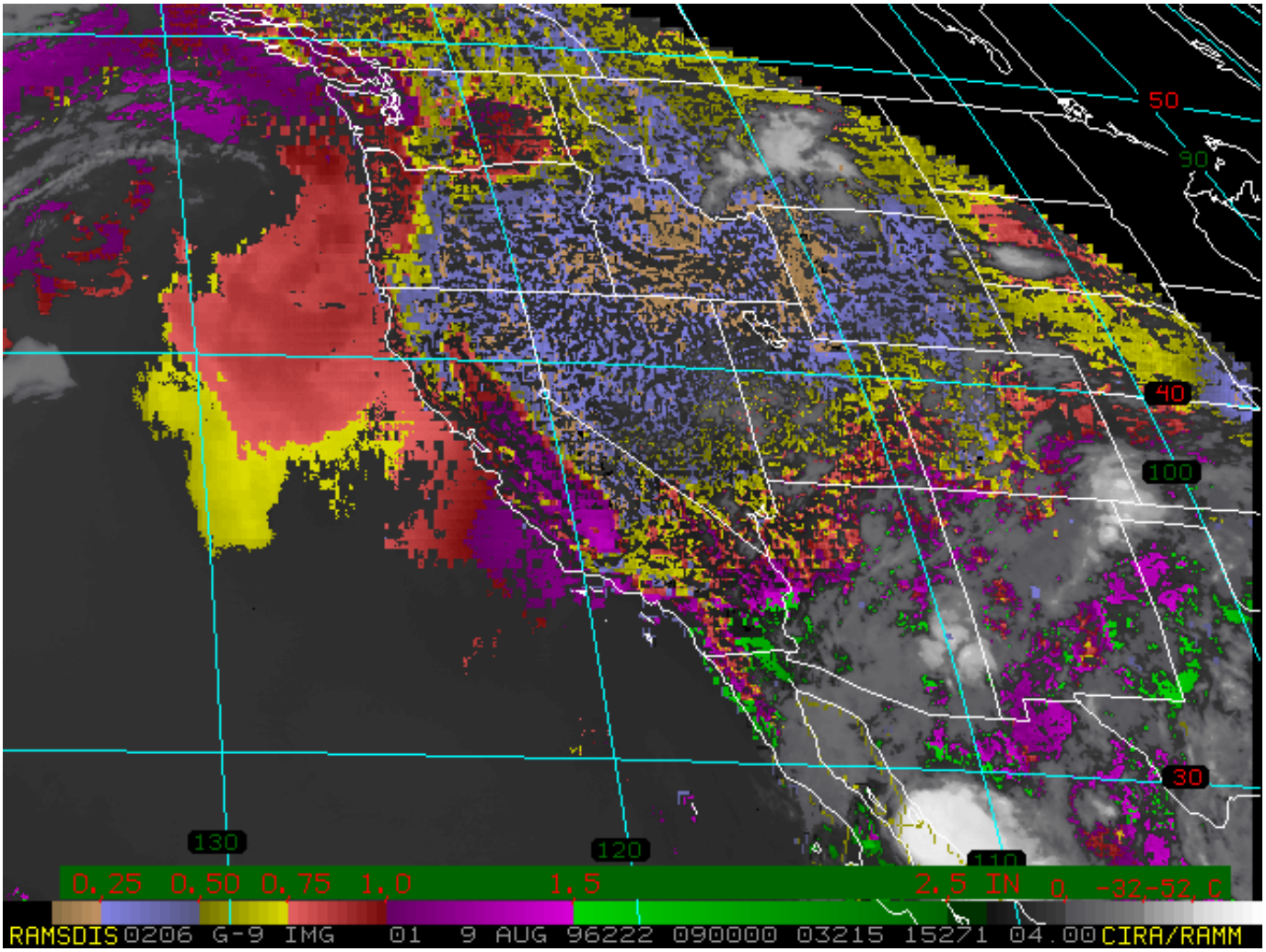
**5. Summary**

**This case points out that the imager DPI data (both PW and LI) can be quite useful in detecting regions that are prone to convection. Although the actual 18Z IMLI DPI**




**values of PW and LI may not be precise, the time evalution of the PW and LI values shown trends that are significant in determining where convection may occur.**

**09Z IMPW DPI**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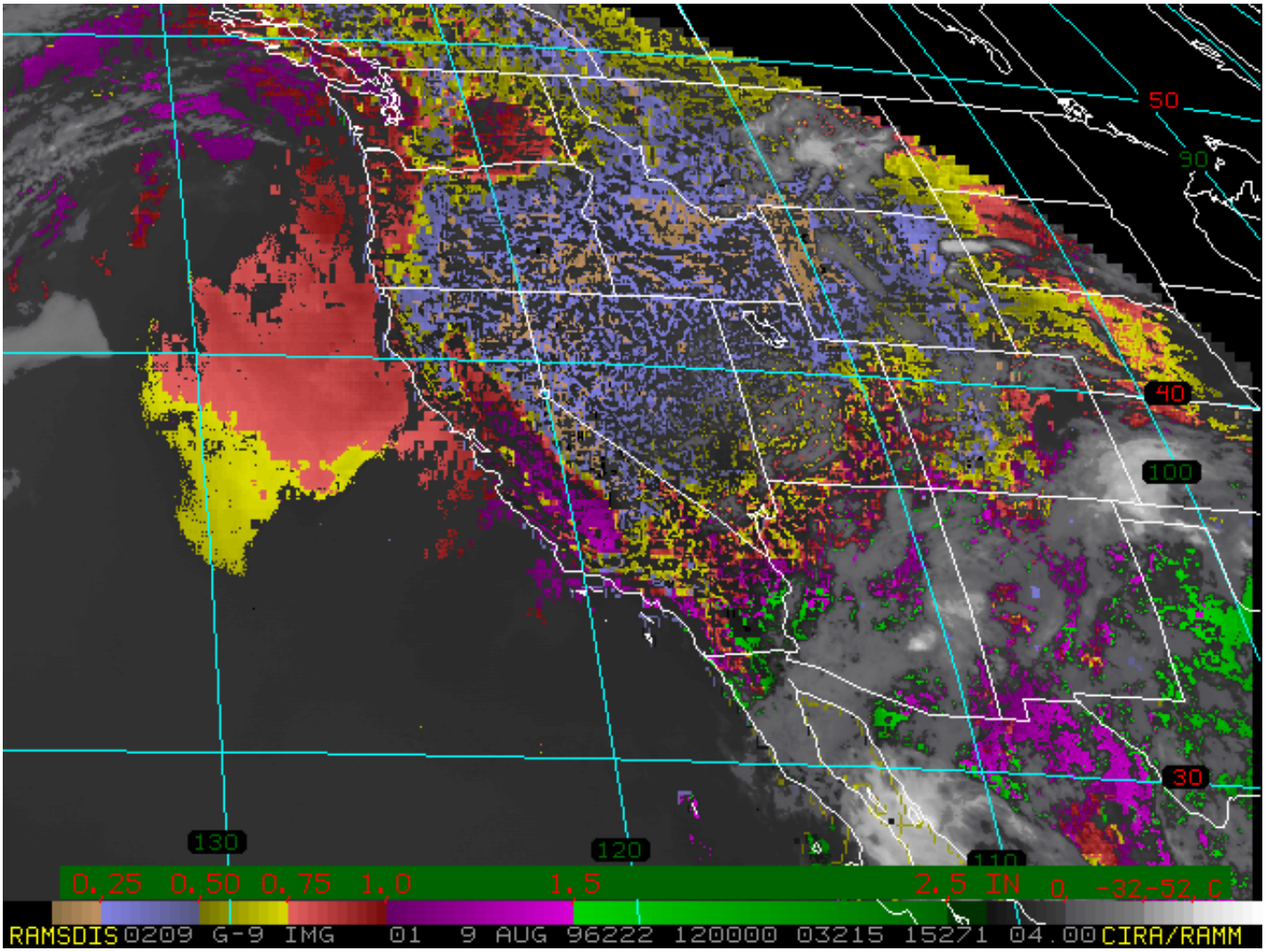
RAMSDIS 0206 G-9 IMG 01 9 AUG 96222 090000 03215 15271 04.00 CIRA/RAMM

**IMPW**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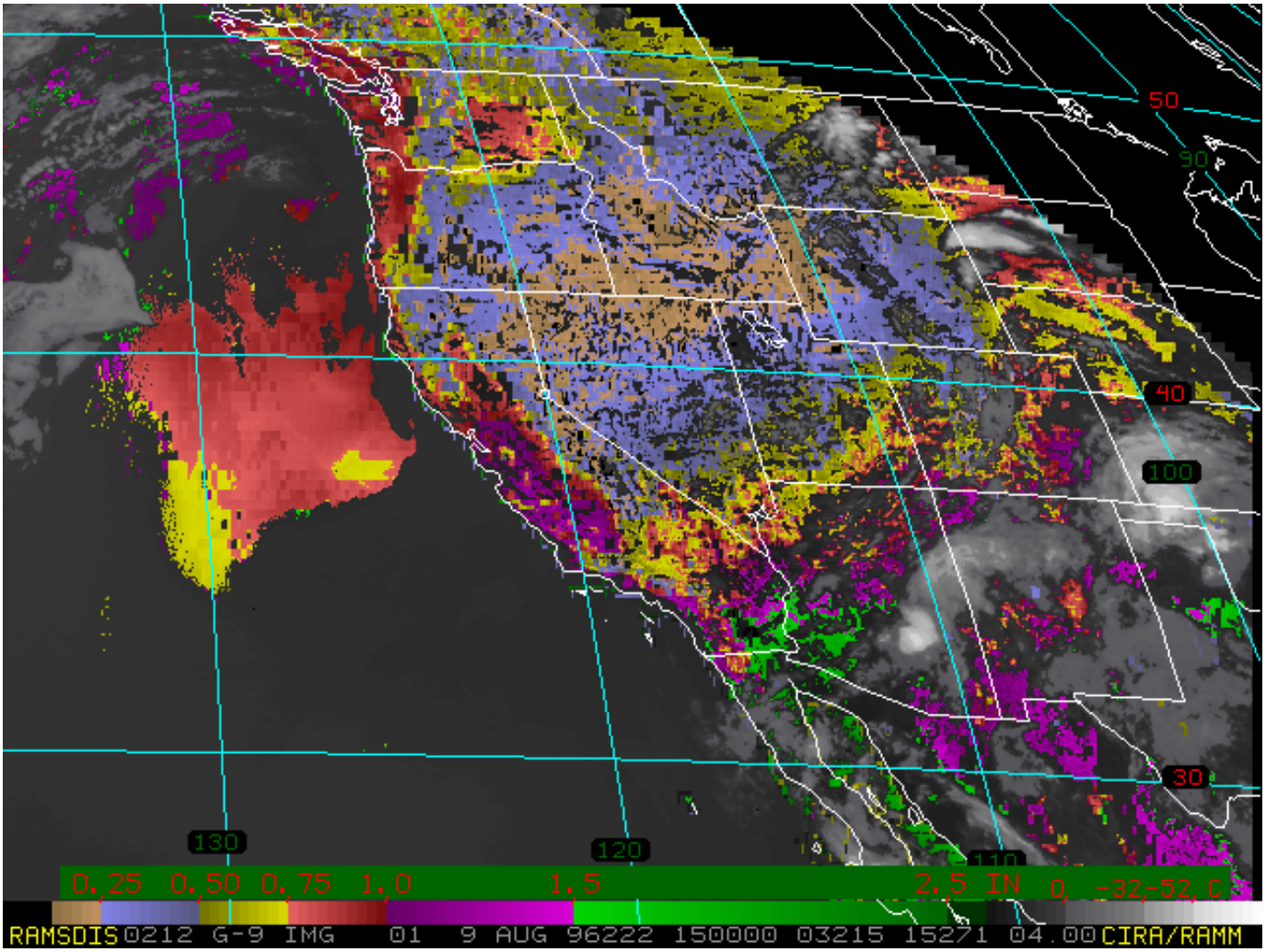
**15Z IMPW DPI**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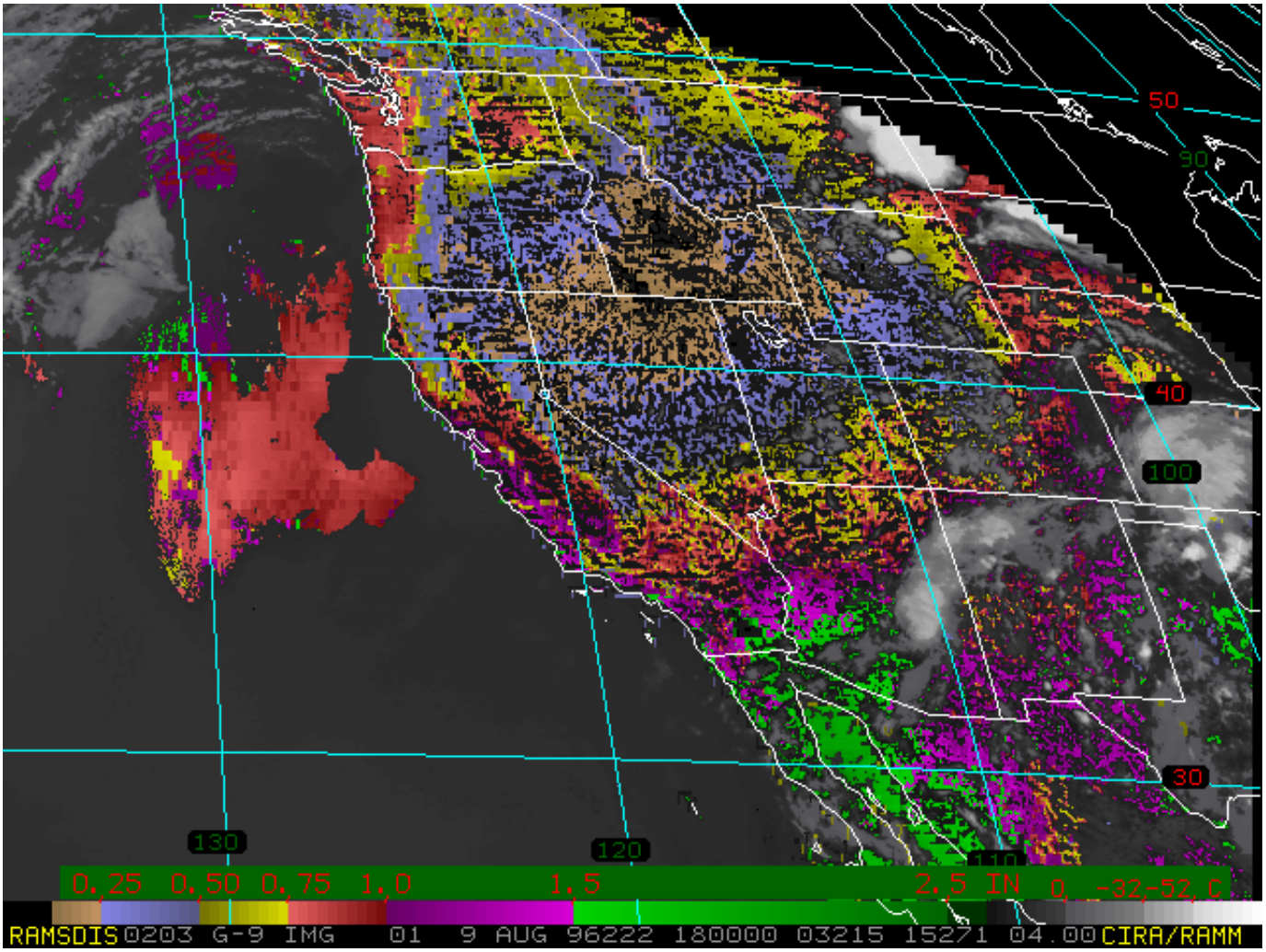
**18Z IMPW DPI**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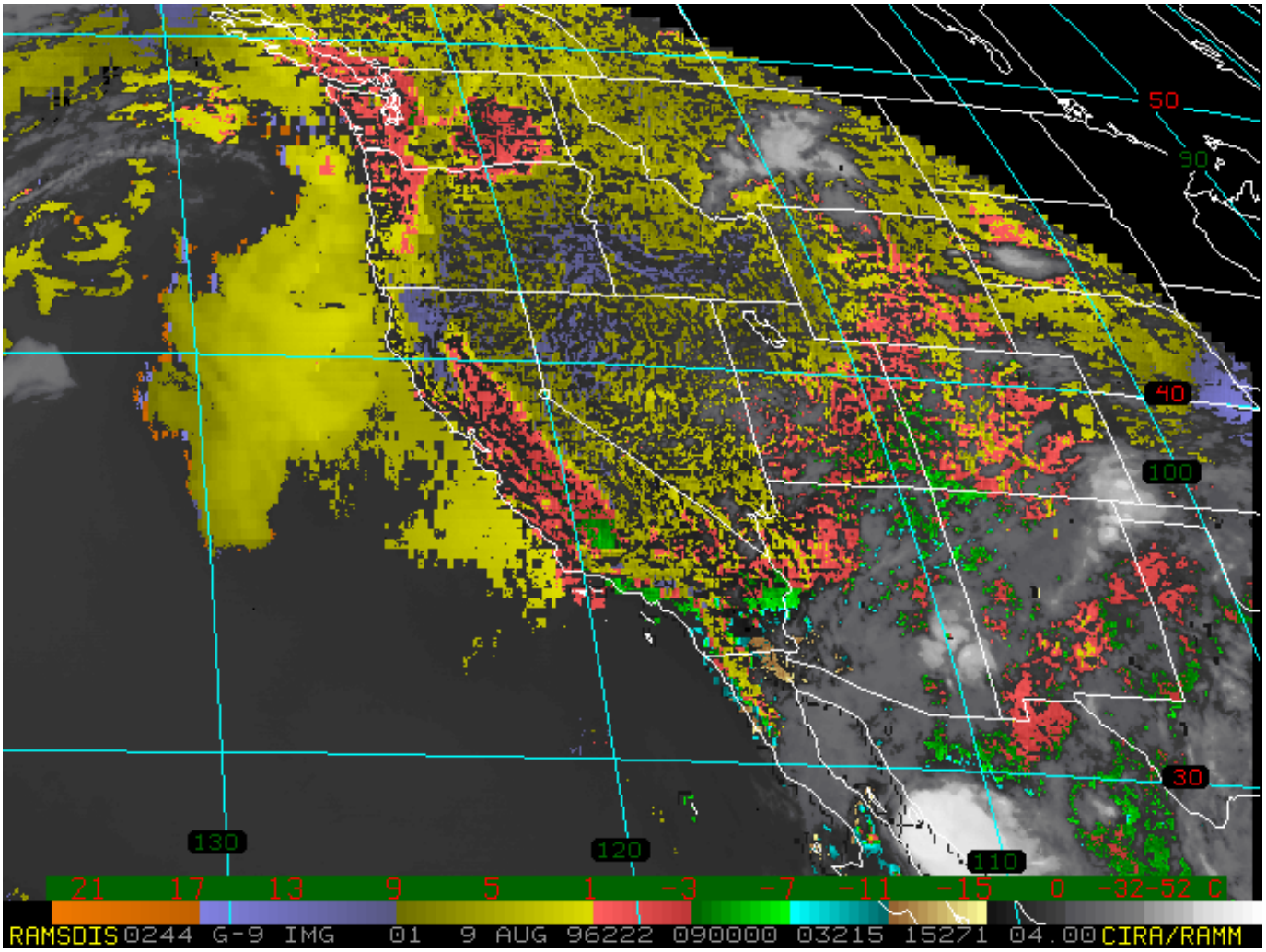
**IMLI**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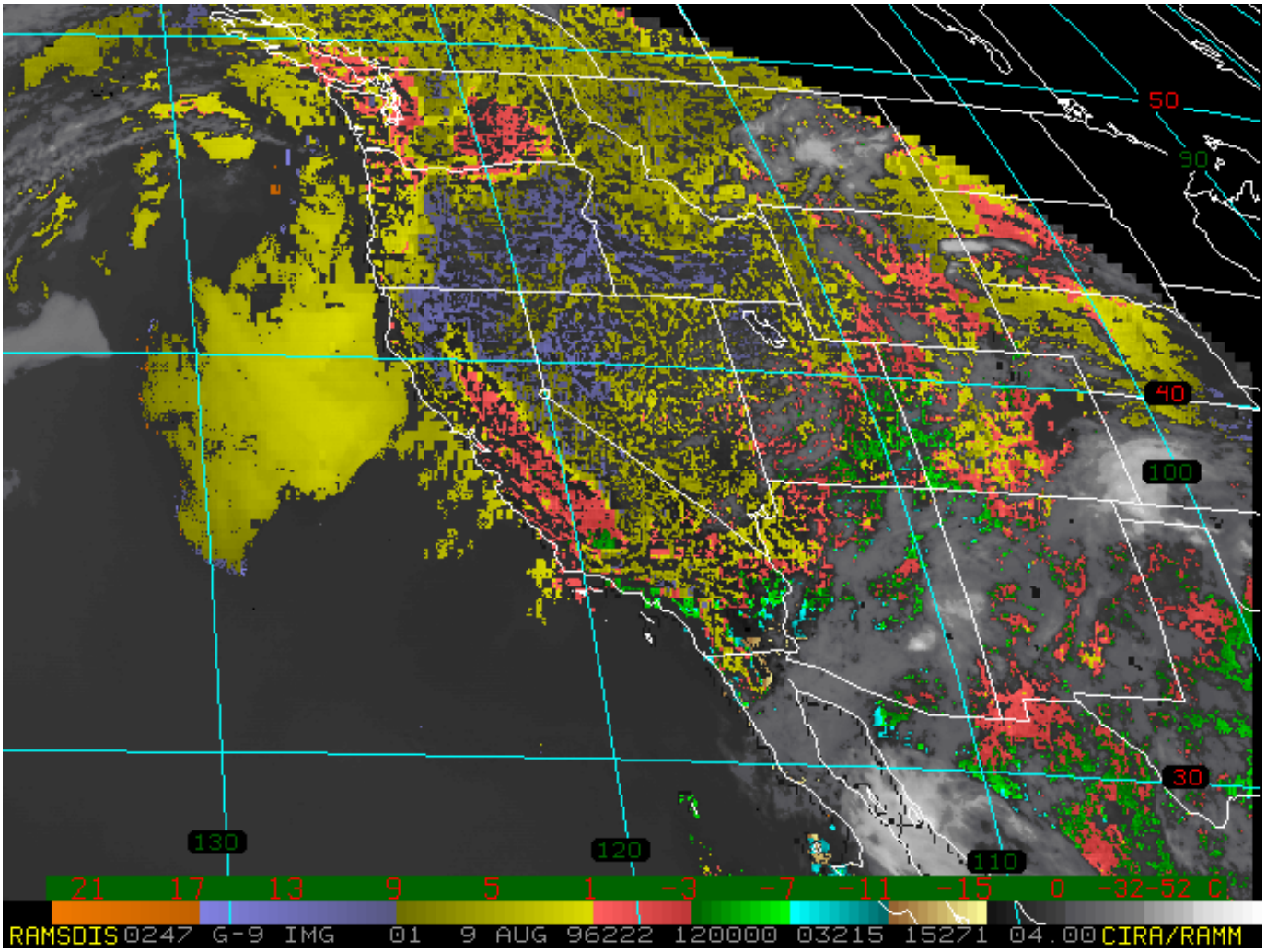
**IML**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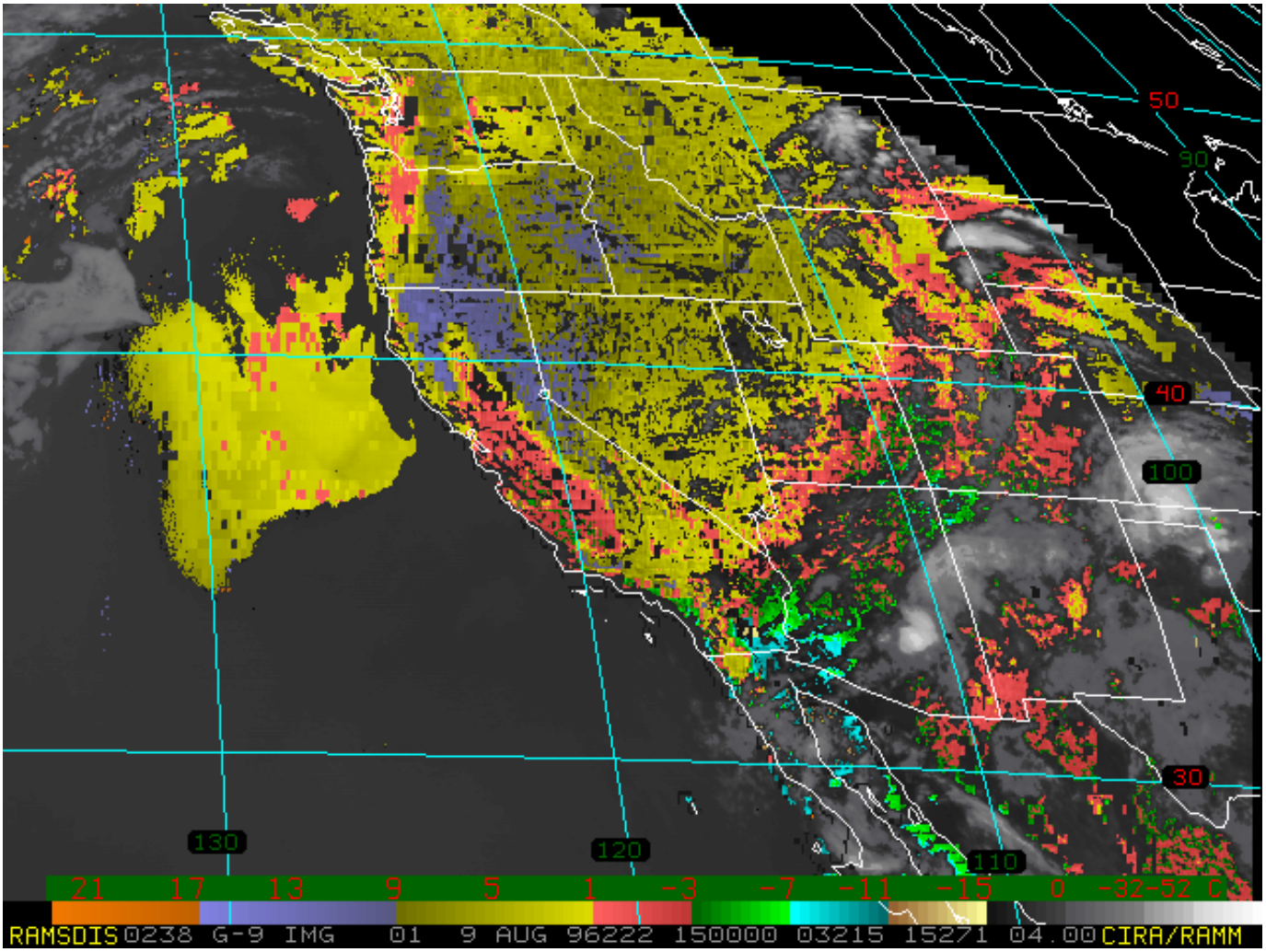
**15Z IMLI DPI**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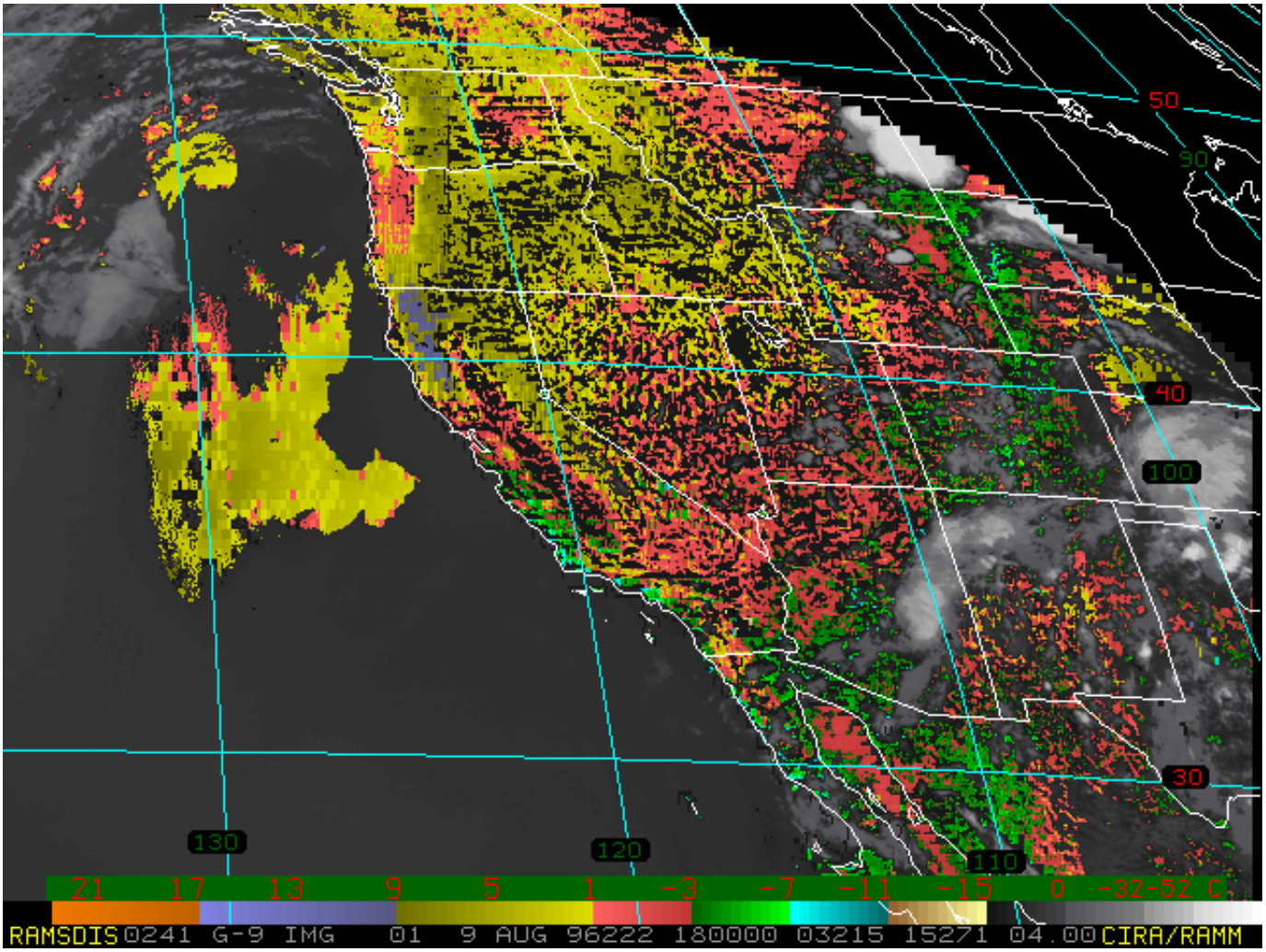
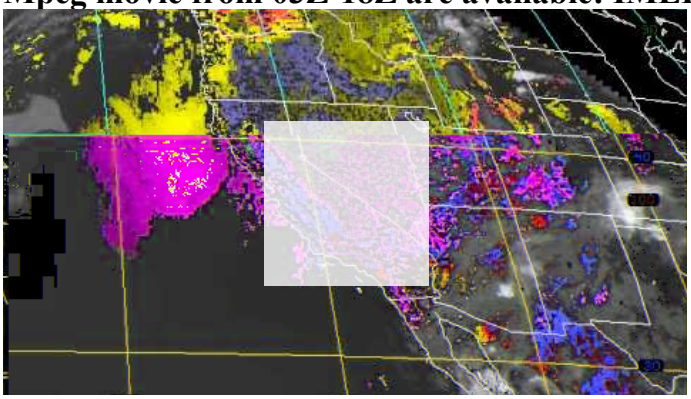
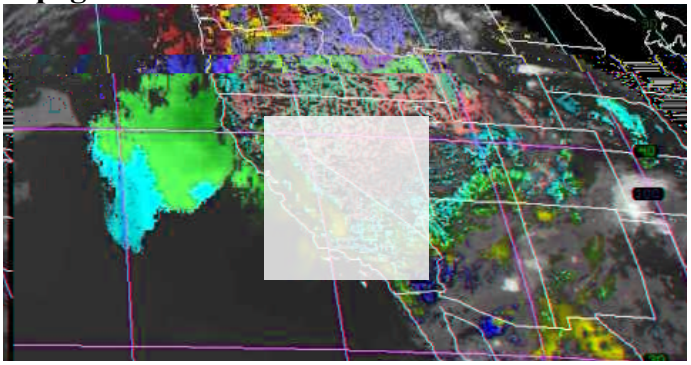
**18Z IMLI DPI**




**Mpeg movie from 03Z-18Z are available: IMLI loop**



**Mpeg movie from 03Z-18Z are available: IMPW loop**



**An mpeg loop of the 2 km VIS.**