Chung-Yi AWIPS2 CAVE Annotation Tool Demo

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NOAA/OAR/ESRL/GSD
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Agenda

- AWIPS2 environment migrated to CentOS7 From CentOS 6
  - A2 environment migrated to CentOS 7 since version 17.2.1
  - Learn and build Docker images for A2 ADE and operational environment
  - Modify TimeZones and World shapefiles by QGIS docker
  - Add UTF8 encoding support in importShapeFile.sh
  - Make CWB tiny localization on A2 docker container. Import CWB shapefiles,modify D2D scales,and D2D scaleInfo.xml
- AWIPS: Build & Install (ABI)
  - Similar to A1 main-script.csh. Compile code, Pack library, and generate rpm files.
  - Practice makes progress
  - Modify setupAndBuildAWIPSconfig.py for version 17.3.1
  - Share my experience on VLab Documentation #54424: **Run AWIPS2_Support on docker**

Agenda(2)

- AWIPS2 CAVE Annotation Tool(CAT) (based on 17.3.1)
  - Background
  - Basic Weather map create capabilities and evaluation
  - CWB products evaluation with CAT+D2D
  - Load-Edit-Product (LEP) framework
  - LEP simulation
- AWIPS2 CAT Plus features and improvement（Under Xiangbao Jing Gudiance）
- AWIPS2 CAT CWB Co-Work Development Plan Draft（Under Xiangbao Jing Gudiance）

AWIPS2 environment migrated to CentOS 7

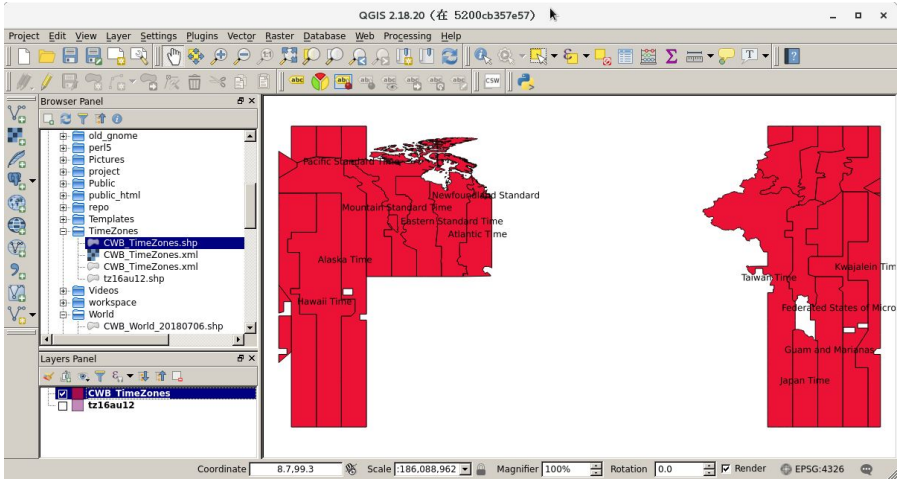
- A2 environment migrated to CentOS 7 since version 17.2.1
  - **CentOS 7 use New Desktop Environemnt(GNOME 3) in CentOS 7**
    - Force Eclipse to use gtk2
      - #Gtk2 forced:
      - export SWT_GTK3=0
      - Eclipse
  - **Use Systemctl to Manage Systemd Services and Units**
      - Example1: Start up Application Service
        - systemctl start docker nvidia-docker
      - Examples2: Setup System default runlevel
        - RunLevel 3: systemctl set-default multi-user.targe
        - RunLevel 5: systemctl set-default graphical.targe
        - Check current default target : systemctl set-default

AWIPS2 environment migrated to CentOS 7

- Learn and build Docker images for A2 ADE and operational environmen
  - **Dockerfile : descript how to build docker image**
    - **https://linuxtechlab.com/learn-create-dockerfile-example/**
    - **install awips2 necessary packages and VirtualGL utility on A2 docker**
    - **setup awips2 environment variables**
  -

AWIPS2 environment migrated to CentOS 7

- Modify TimeZones and World shapefile by QGIS docker
  - Add UTC+8 TimeZone (Taiwan TimeZone) into latest TimeZone shapefile
  - Modify Asia Area shape in latest World shapefile
  - QGIS docker usage
    - # Get QGIS docker image
    - $ docker pull kartoza/qgis-desktop:LTR
    - # Execute QGIS docker container
    - $ nvidia-docker run --rm --name="qgis-desktop" -i -t -v ${HOME}:/home/${USER}
    - -v /tmp/.X11-unix:/tmp/.X11-unix -e DISPLAY=unix$DISPLAY kartoza/qgis-desktop:LTR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Browser Panel
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perl5
Pictures
project
Public
public_html
repo
Templates
TimeZones
CWB_TimeZones.shp
CWB_TimeZones.xml
CWB_TimeZones.xml
tz16au12.shp
Videos
workspace
World
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CWB_TimeZones
tz16au12
Pacific Standard Time
Mountain Standard Time
Eastern Standard Time
Atlantic Time
Alaska Time
Hawaii Time
Taiwan Time
Guam and Mariana
Japan Time
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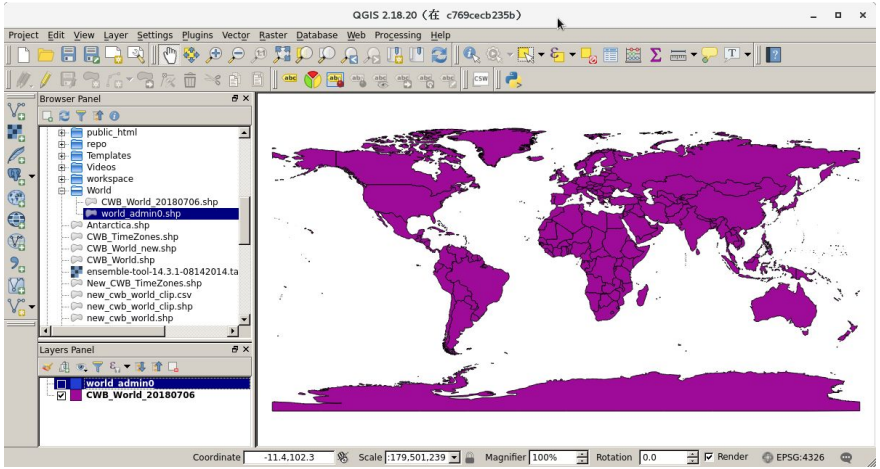
Magnifier 100%
Rotation 0.0
Render
EPSG:4326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Project Edit View Layer Settings Plugins Vector Raster Database Web Processing Help
Browser Panel
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repo
Templates
Videos
workspace
World
CWB_World_20180706.shp
world_admin0.shp
Antarctica.shp
CWB_TimeZones.shp
CWB_World_new.shp
CWB_World.shp
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New_CWB_TimeZones.shp
new_cwb_world_clip.csv
new_cwb_world_clip.shp
new_cwb_world.shp
Layers Panel
world_admin0
CWB_World_20180706
Coordinate -11.4,102.3
Scale 1:179,501,239
Magnifier 100%
Rotation 0.0
Render
EPSG:4326

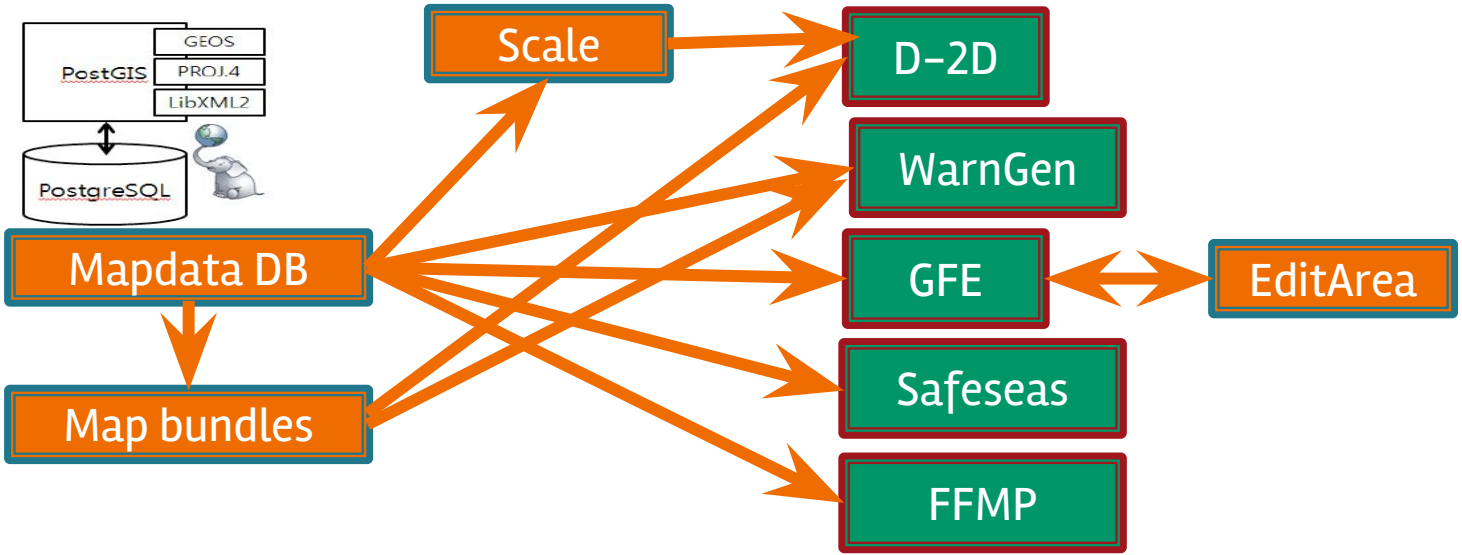
AWIPS2 environment migrated to CentOS 7

- Add UTF8 encoding support in importShapeFile.sh
  - importShapeFile.sh just support LATIN1 encoding now
  - Add a a parameter encoding and modified some code to add UTF8 encoding support in importShapeFile.sh

```
ENCODING="LATIN1"          (for shp2pgsql utility)
OGR2OGR_ENCODING=""
if [ $# -eq 3 ] ; then
        case ${3} in
        "UTF8")
        ENCODING="UTF8"
        OGR2OGR_ENCODING="-lco   ENCODING=UTF-8"
        ;;
        *)
        ENCODING="LATIN1"
        OGR2OGR_ENCODING=""
        esac
fi
```

AWIPS2 environment migrated to CentOS 7

- Make CWB tiny localization on A2 docker container. Import CWB shapefiles,modify D2D scales,and D2D scaleInfo.xml
    - import CWB shapefiles and copy CWB scale config files into A2 docker container



AWIPS: Build & install(ABI)

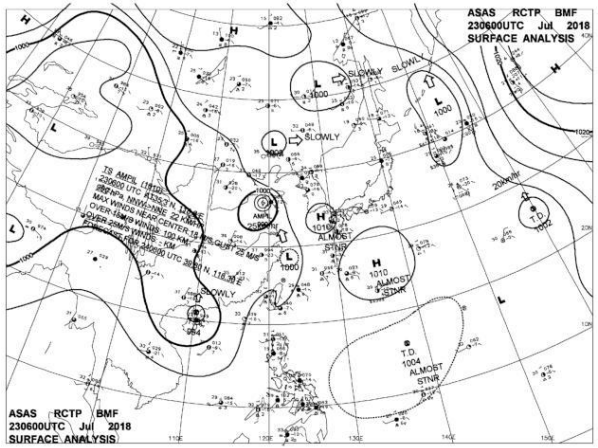
- Similar to A1 main-script.csh
  - Compile code
  - Pack library
  - Generate rpm files
- Modify setupAndBuildAWIPSconfig.py for version 17.3.1 (AWIPS2_Support, VLab Issue #54420 code review passed)
  - Modify the repo_version of AWIPS2_Data_Delivery and AWIPS 2_NASA_SPoRT to master_17.3.1 because getParameterHandlerRegistered bean renamed to getParameterHandler
  - Share my experience on VLab Documentation #54424: **Run AWIPS2_Support on docker**

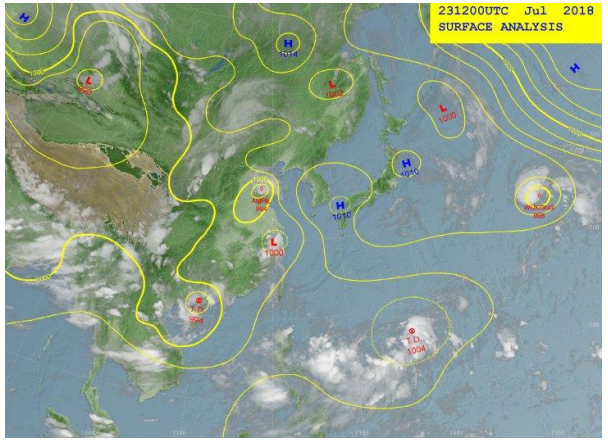
AWIPS2 CAVE Annotation Tool(CAT) (based on 17.3.1)

- Background
  - CWB Weather Contour products are drawn by WCE(Weather Contour Editor) .
  - WCE is based on AWIPS FX-C. AWIPS FX-C needs D-2D IGC_Process component support.
  - In the future we wish all AWIPS environment is migrated to AWIPS2 platform, so we should enhance AWIPS2 CAVE Annotation Tool (CAT) functions to support CWB requirements.
- Basic Weather map create capabilities and evaluation
  - CWB Weather Contour products are drawn by WCE(Weather Contour Editor) .
  - Current CWB Basic Weather maps
    - 3 **Categories:**
      - Cate 1 Surface Analysis
      - Cate 2 Week Forecast Chart
      - Cate 3 Marine Wave Chart

AWIPS2 CAVE Annotation Tool(CAT) (based on 17.3.1)

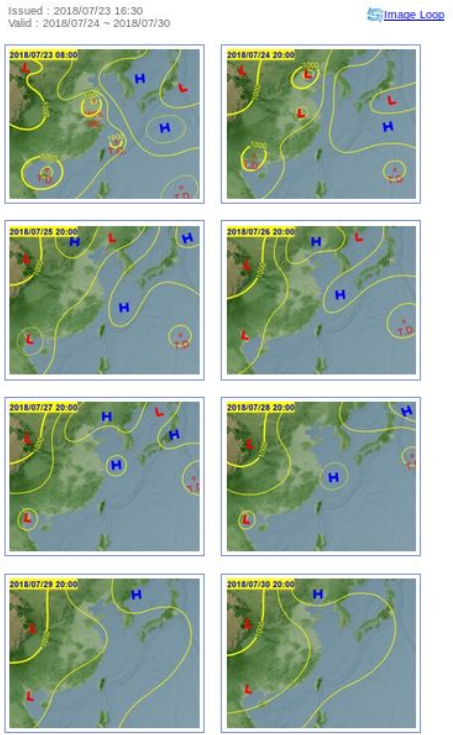
- Cate 1 Surface Analysis
  - has 2 products. drawn on **WCE_New scale**.
    - Current Weather Chart ,background is **observation data.**
    - Surface Analysis, ,background is **Japanese satellite imagery**.





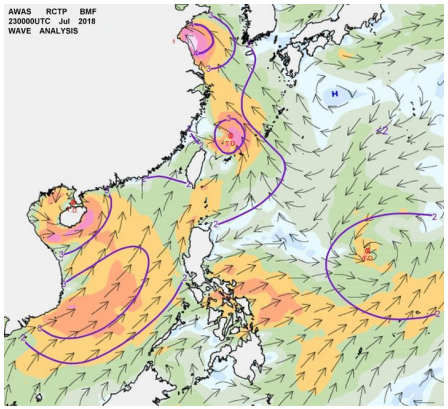
AWIPS2 CAVE Annotation Tool(CAT) (based on 17.3.1)

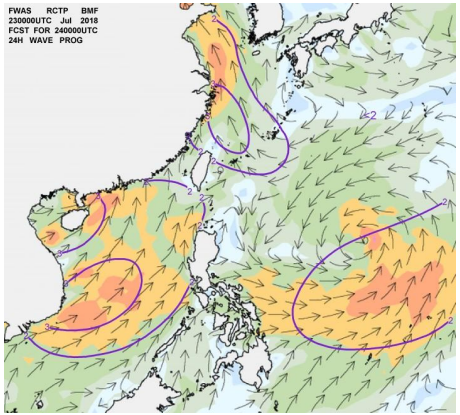
- Cate 2 Week Forecast Chart
  - has 1 product 7-day Forecast Chart. drawn on **WCE_Week scale**
    - Every forecast time chart's background is **Japanese satellite imagery**.

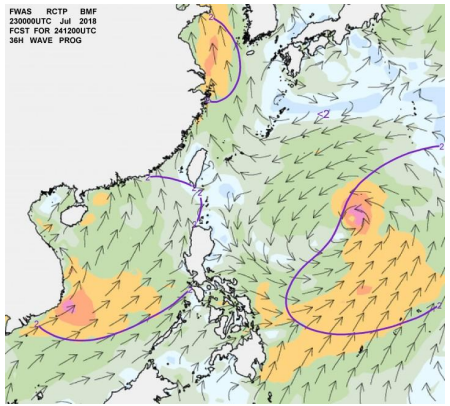


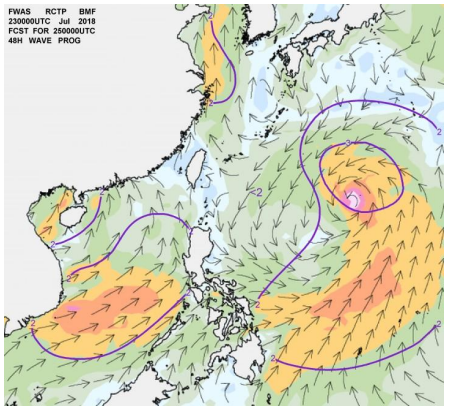
AWIPS2 CAVE Annotation Tool(CAT) (based on 17.3.1)

- Cate 3 Marine Wave Chart
  - has 4 products, drawn on **WCE_Marine scale**, background is **NCEP GFS Wind Speed imagery**.
    - Wave Chart
    - 24-h Prognostic Wave Chart
    - 36-h Prognostic Wave Chart
    - 48-h Prognostic Wave Chart.







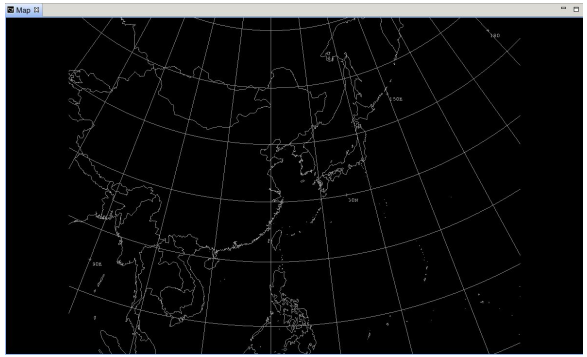


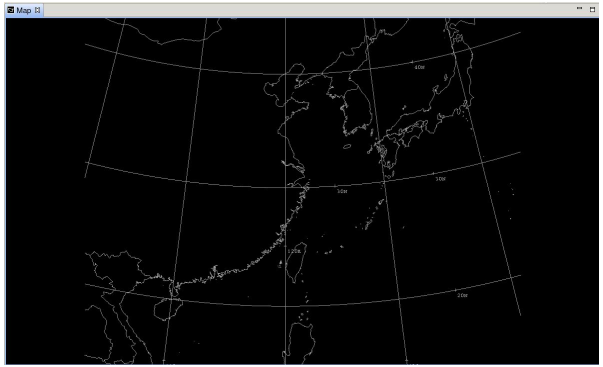
AWIPS2 CAVE Annotation Tool(CAT) (based on 17.3.1)

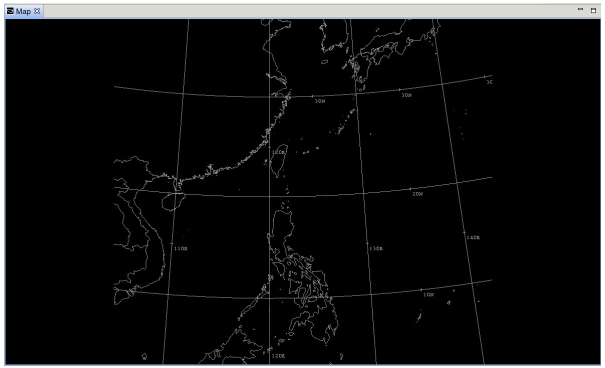
- CWB products evaluation with CAT+D2D
  - Depend on our classification we should generate 3 D-2D scales (projection configuration) for CWB Weather Contour products.

D2D scale	Projection Name	central Meridian	latitude_of_Origin	Satandard_paralle_1	Satandard_paralle_2	Corner UL(Upper Left)	Corner LR(Lower Right)
WCE_New	**Lambert Conformal Conic 2SP**	**120.0**	**45.0**	**60.0**	**30.0**	**(48.428741, 60.483143)**	**(-1.352701, 153.789413)**
WCE_Week	**Lambert Conformal Conic 2SP**	**120.0**	**45.0**	**60.0**	**30.0**	**(42.208755, 95.220001)**	**(13.103169, 139.035049)**
WCE_Marine	**Lambert Conformal Conic 2SP**	**120.0**	**25.0**	**40.0**	**10.0**	**(36.630894, 100.825104)**	**(2.085999, 140.727402)**

AWIPS2 CAVE Annotation Tool(CAT) (based on 17.3.1)







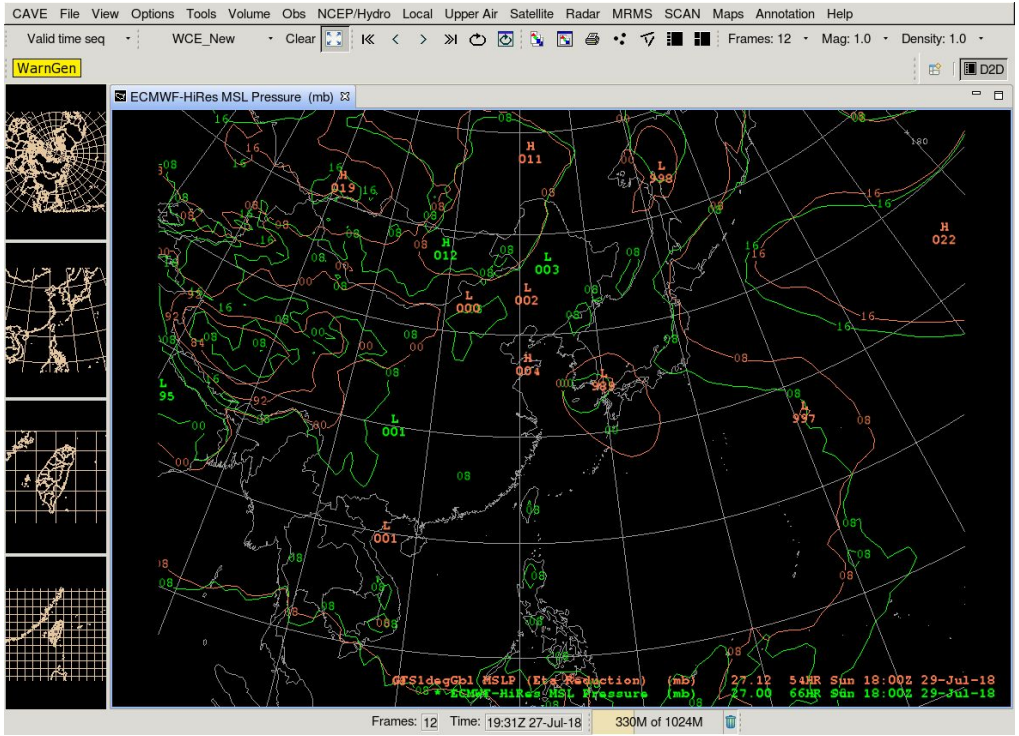
WCE_New Scale

WCE_Week Scale

WCE_Marine Scale

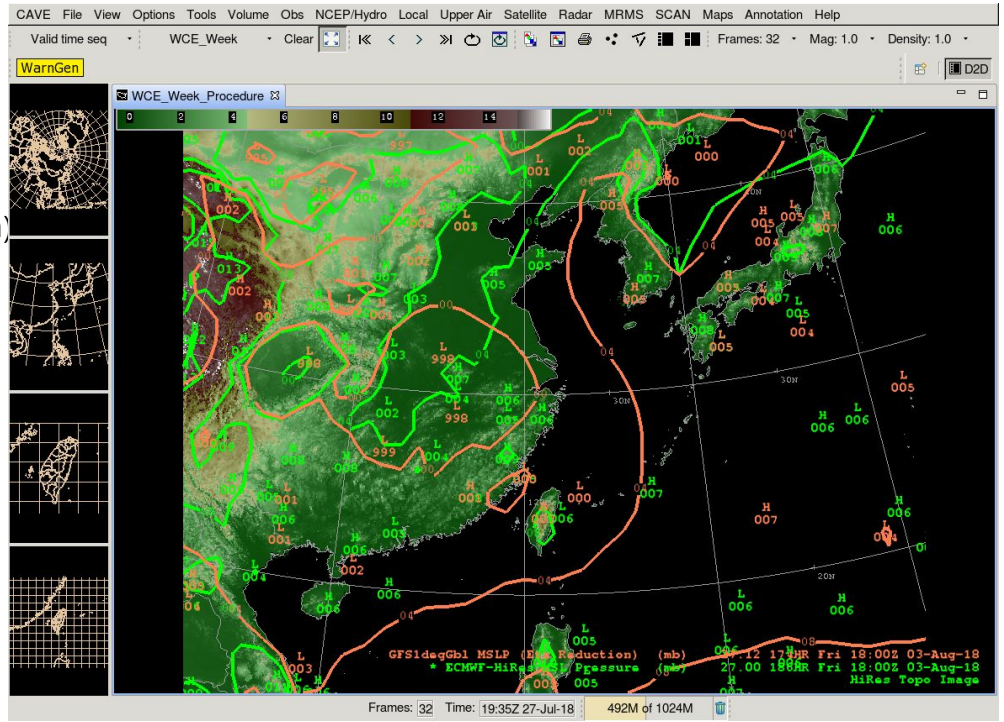
AWIPS2 CAVE Annotation Tool(CAT) (based on 17.3.1)

- WCE_New_Procedure
  - WCE_New Scale
  - Models
    - ECMWF-HiRes MSL Pressure
    - GFS1degGbl MSLP (Eta Reduction)



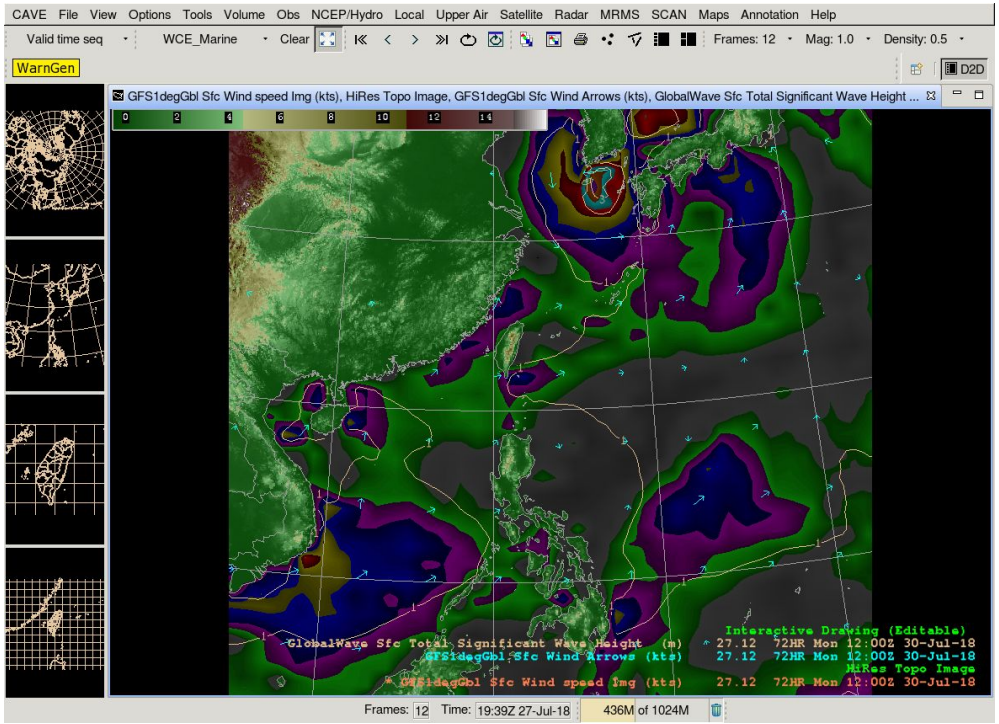
AWIPS2 CAVE Annotation Tool(CAT) (based on 17.3.1)

- WCE_Week_Procedure
  - WCE_Week Scale
  - Models and other data
    - ECMWF-HiRes MSL Pressure
    - GFS1degGbl MSLP (Eta Reduction)
    - HiRes Topo Image



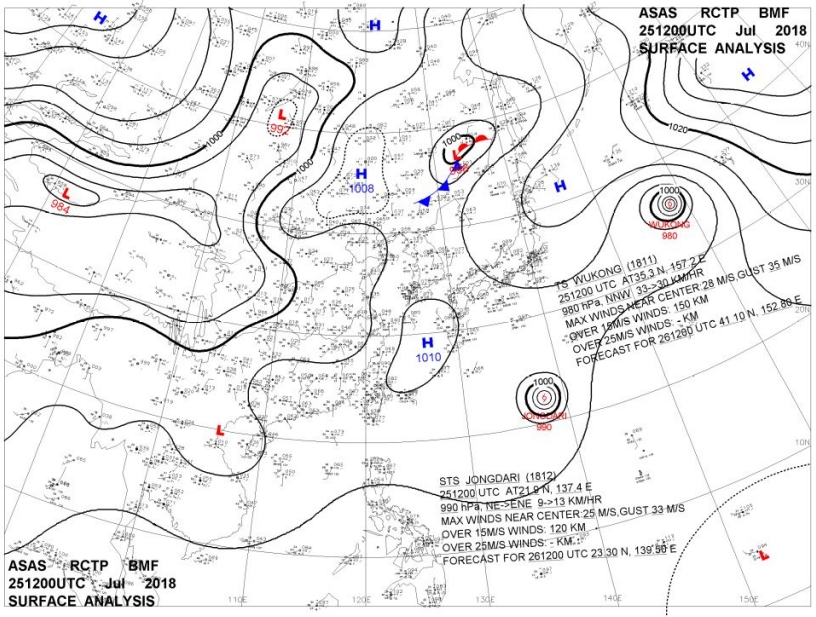
AWIPS2 CAVE Annotation Tool(CAT) (based on 17.3.1)

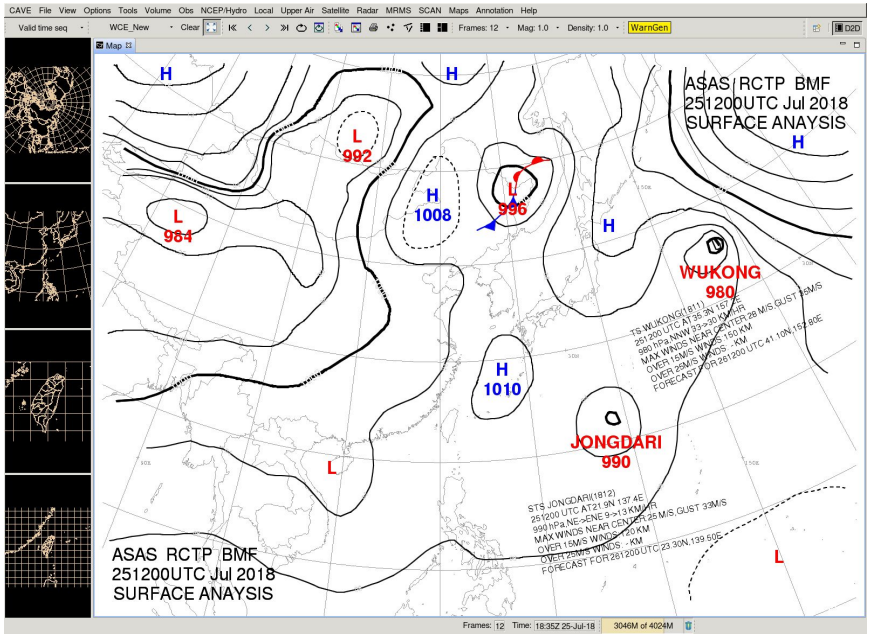
- WCE_Marine_Procedure
  - WCE_Marine Scale
  - Models and other data
    - GlobalWave Sfc Total Significant Wave Height
    - GFS1degGbl Sfc Wind Arrows
    - HiRes Topo Image
    - GFS1degGbl Sfc Wind speed Img



AWIPS2 CAVE Annotation Tool(CAT) (based on 17.3.1)

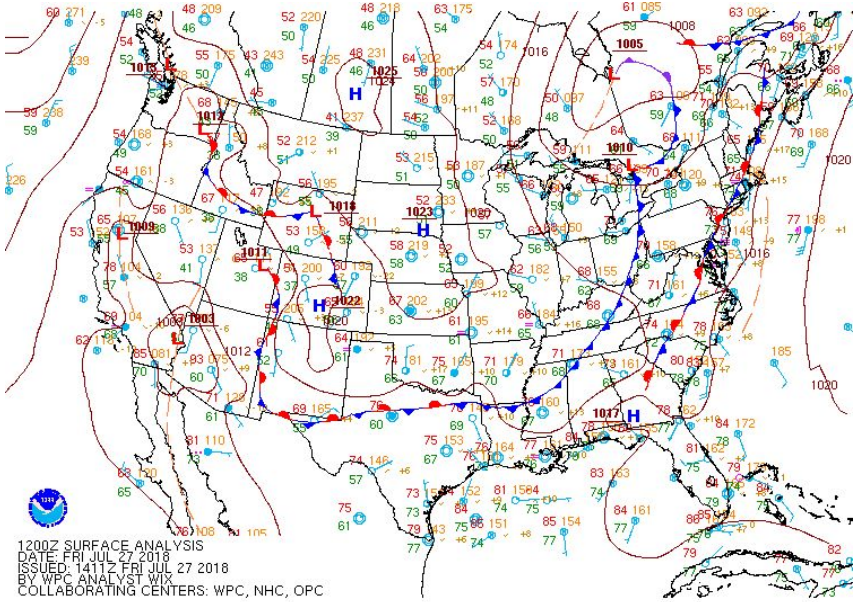
- Compare some current products with CAT created
  - Cate 1 Surface Analysis simulation

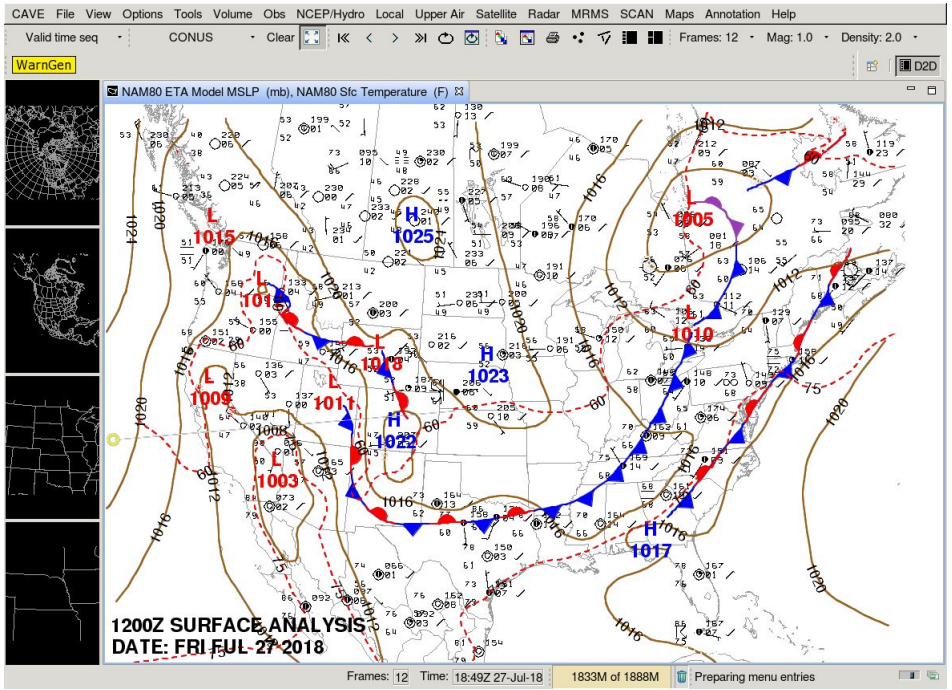




AWIPS2 CAVE Annotation Tool(CAT) (based on 17.3.1)

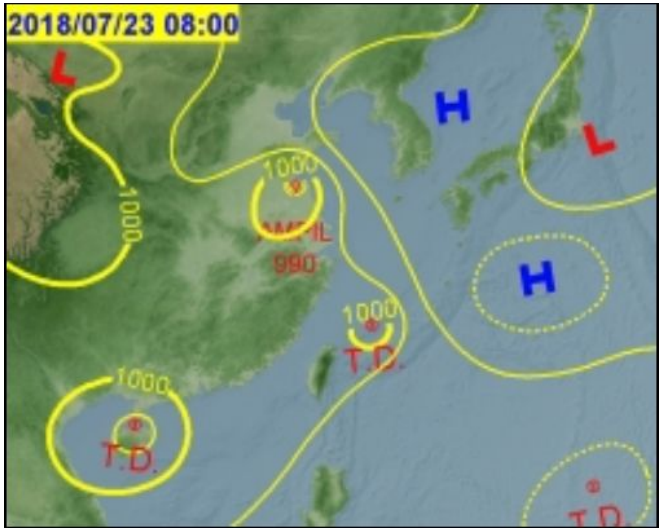
- Compare some current products with CAT created
  - Cate 1 Surface Analysis simulation(WPC)

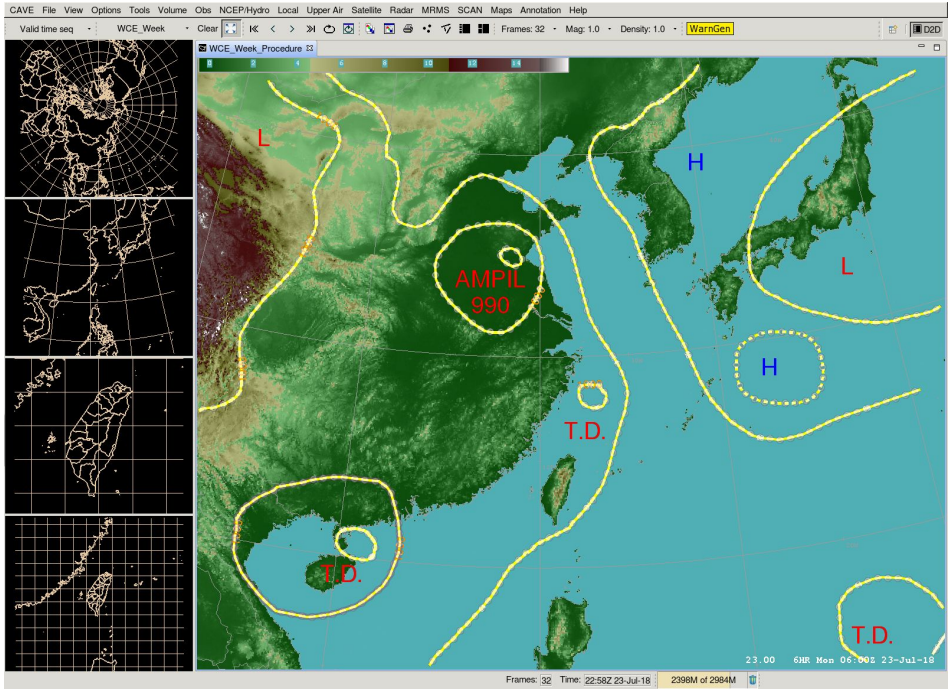




AWIPS2 CAVE Annotation Tool(CAT) (based on 17.3.1)

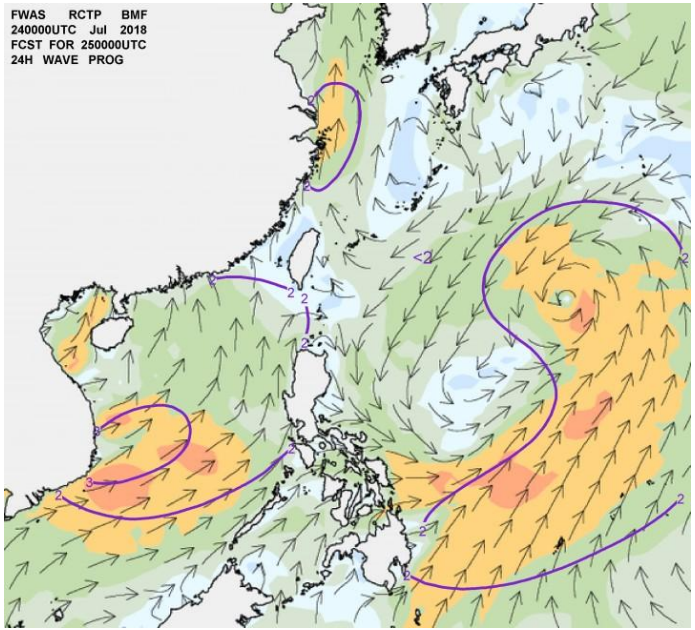
- Compare some current products with CAT created
  - Cate 2 Week Forecast Chart simulation

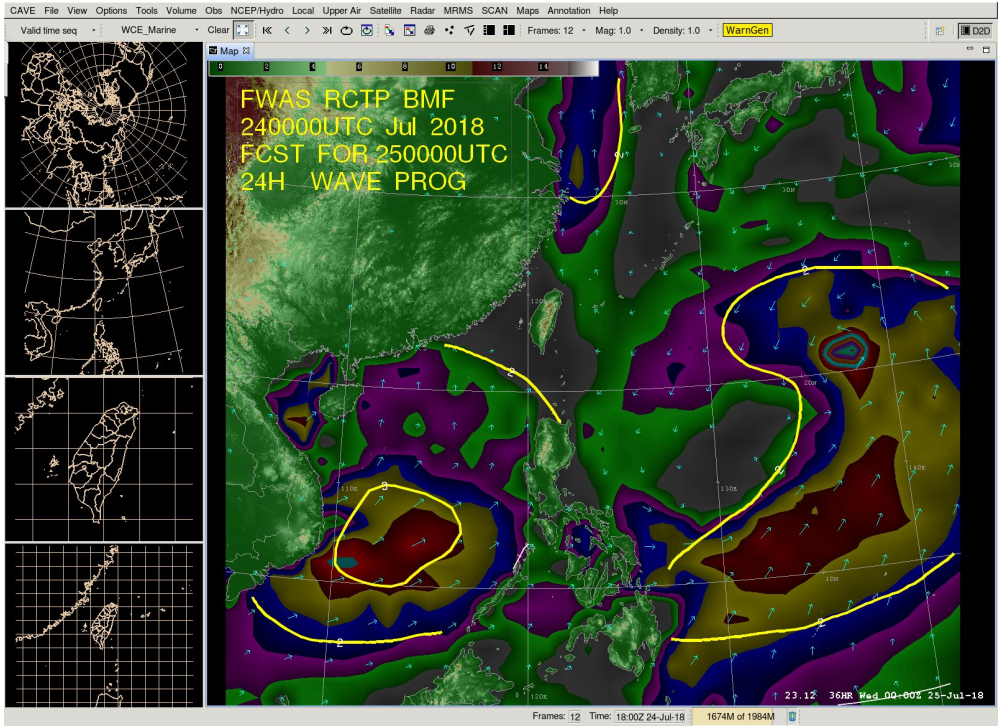




AWIPS2 CAVE Annotation Tool(CAT) (based on 17.3.1)

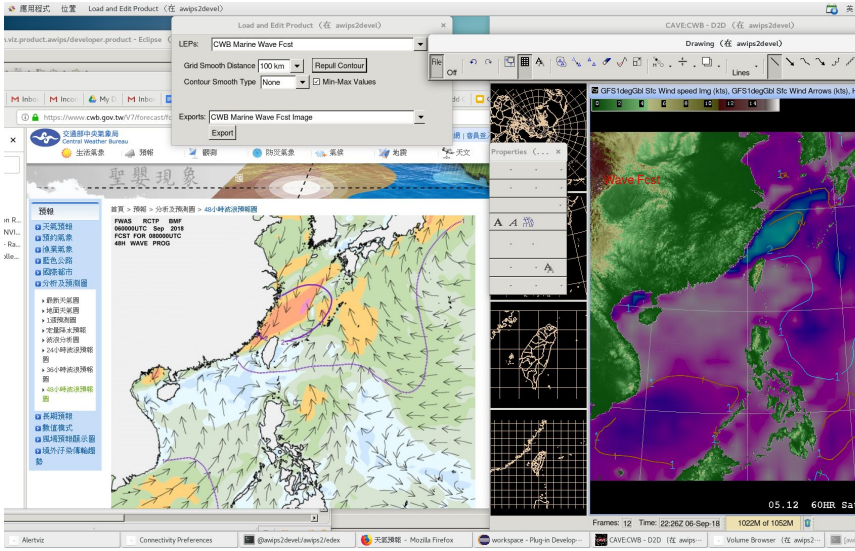
- Compare some current products with CAT created
  - Cate 3 Marine Wave Chart simulation





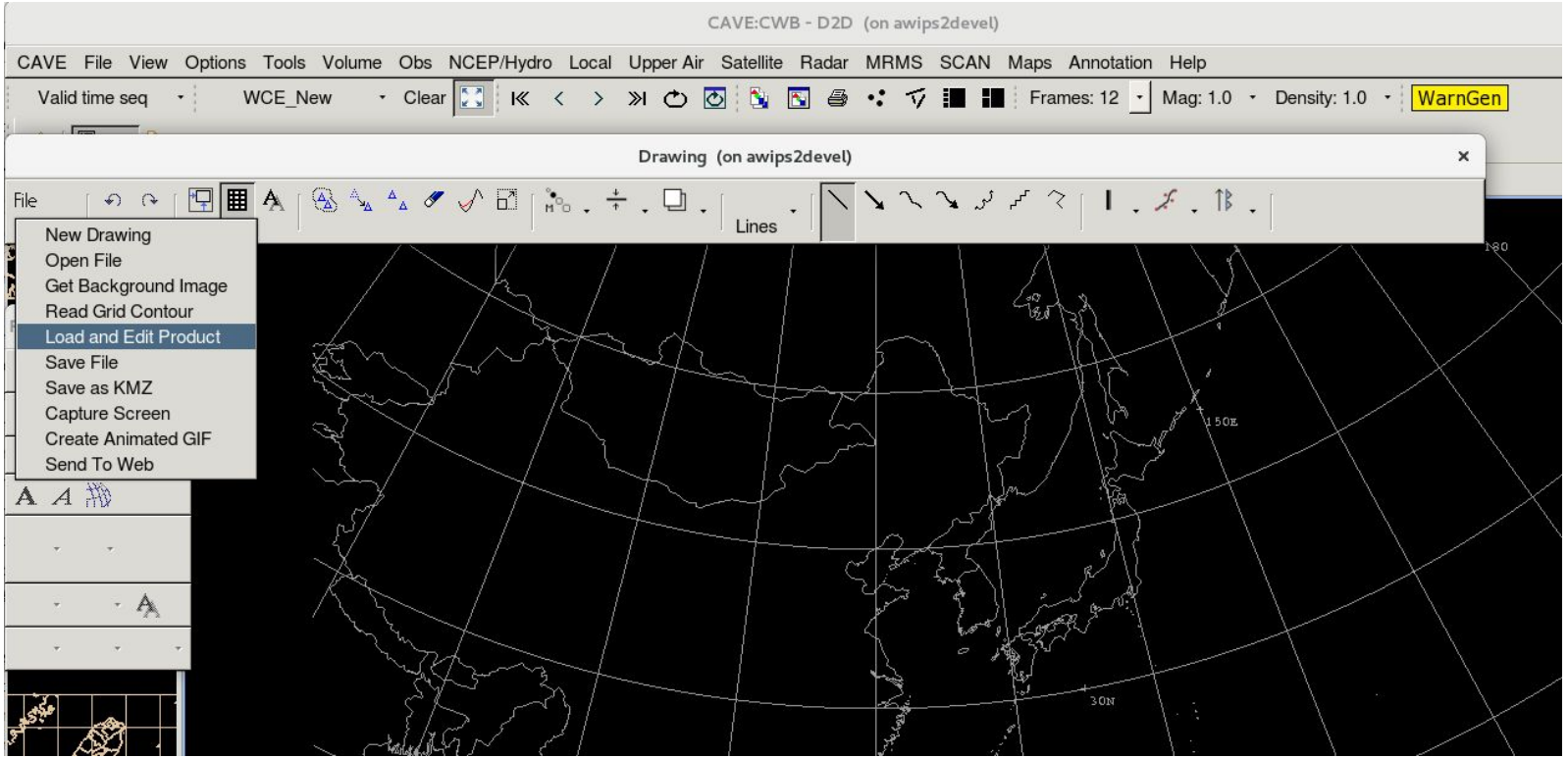
AWIPS2 CAVE Annotation Tool(CAT) (based on 17.3.1)

- Load-Edit-Product (LEP) framework.
  - Configurable GUI
    - load product set, pull out select contours
    - initialize new product label/name, edit
    - export to Web or specific format product files.
    - Load products, initial drawing and pull out editable grid as one procedure
  - Functional Rapid Tool
    - Make product based on D2D, such as weather story and forecast. To create product convenience, efficient, flexible, none code work.



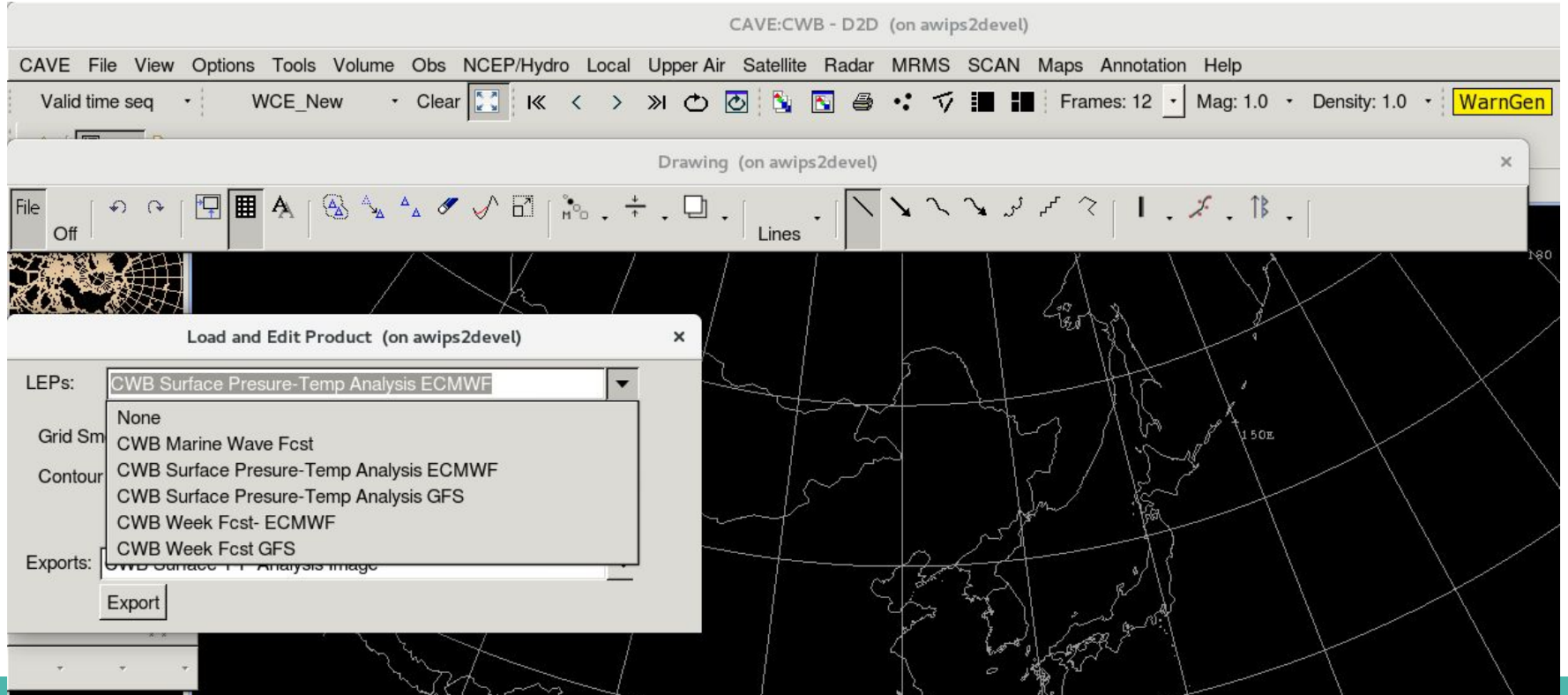
AWIPS2 CAVE Annotation Tool(CAT) (based on 17.3.1)

- LEP simulation



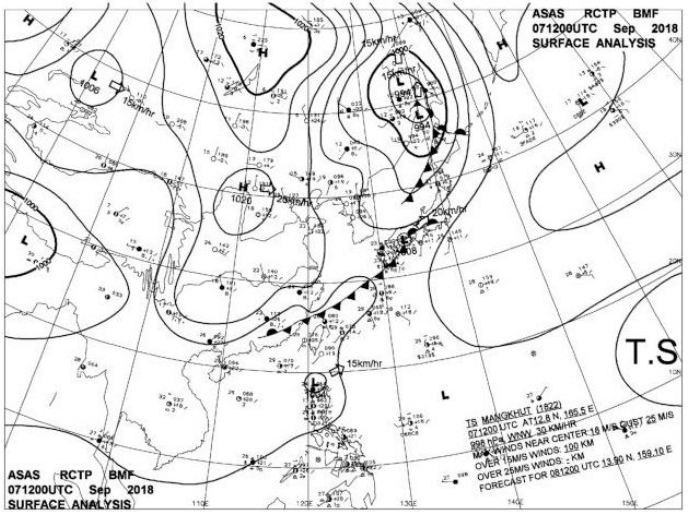
AWIPS2 CAVE Annotation Tool(CAT) (based on 17.3.1)

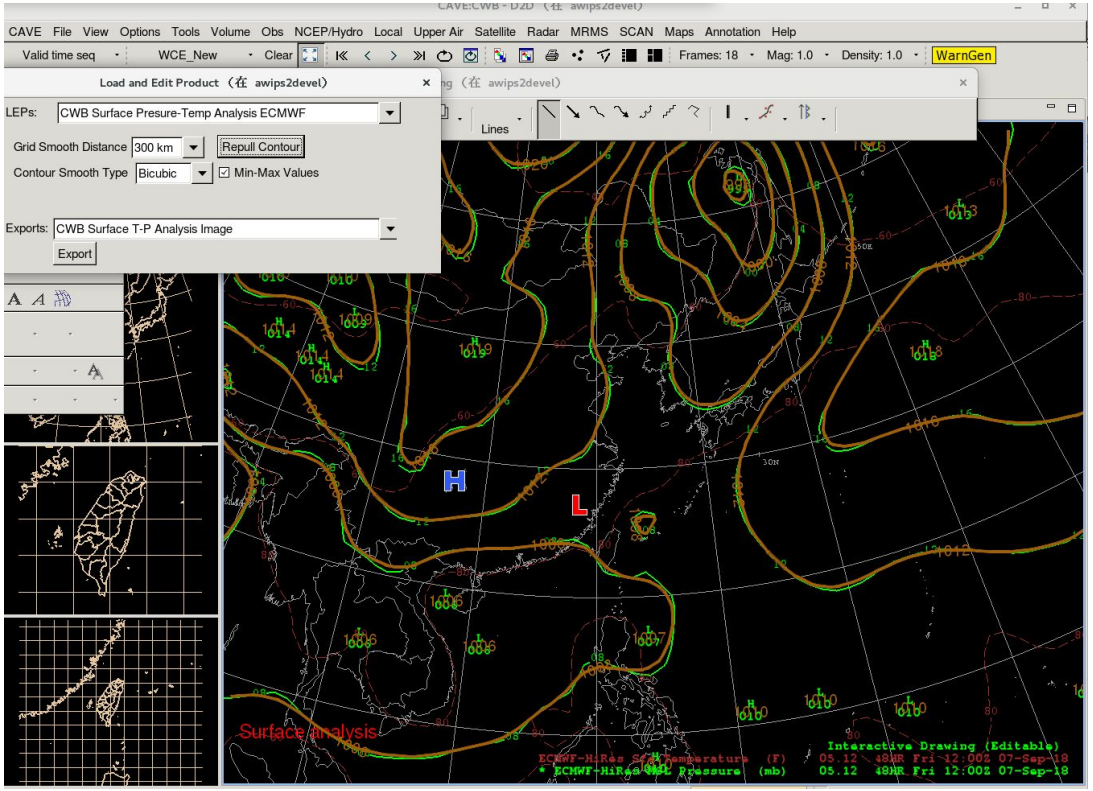
- LEP simulation



AWIPS2 CAVE Annotation Tool(CAT) (based on 17.3.1)

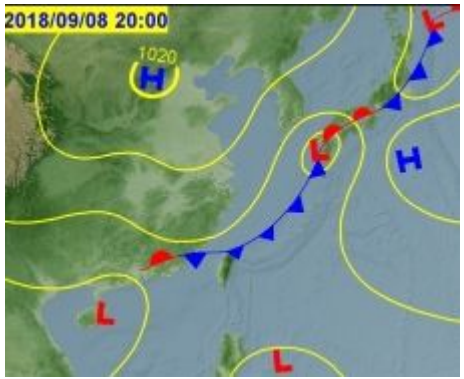
- LEP simulation
  - WCE_New Surface Analysis simulation

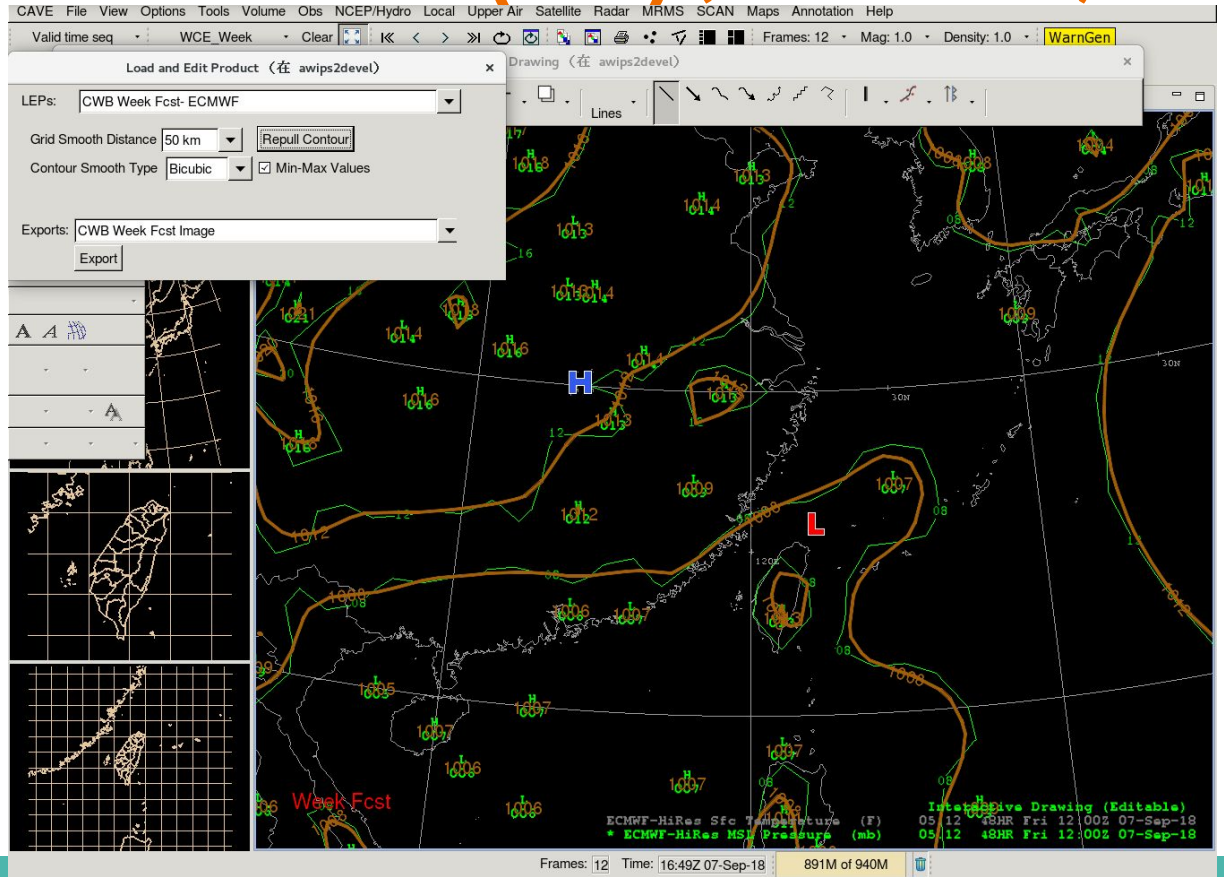




AWIPS2 CAVE Annotation Tool(CAT) (based on 17.3.1)

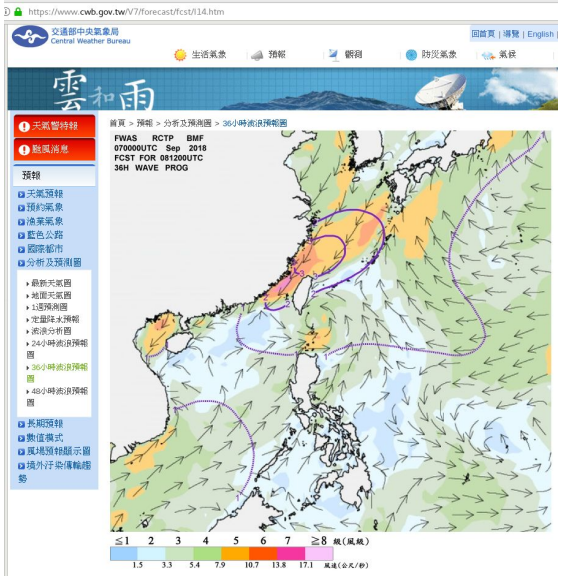
- LEP simulation
  - WCE_Week Fcst simulation

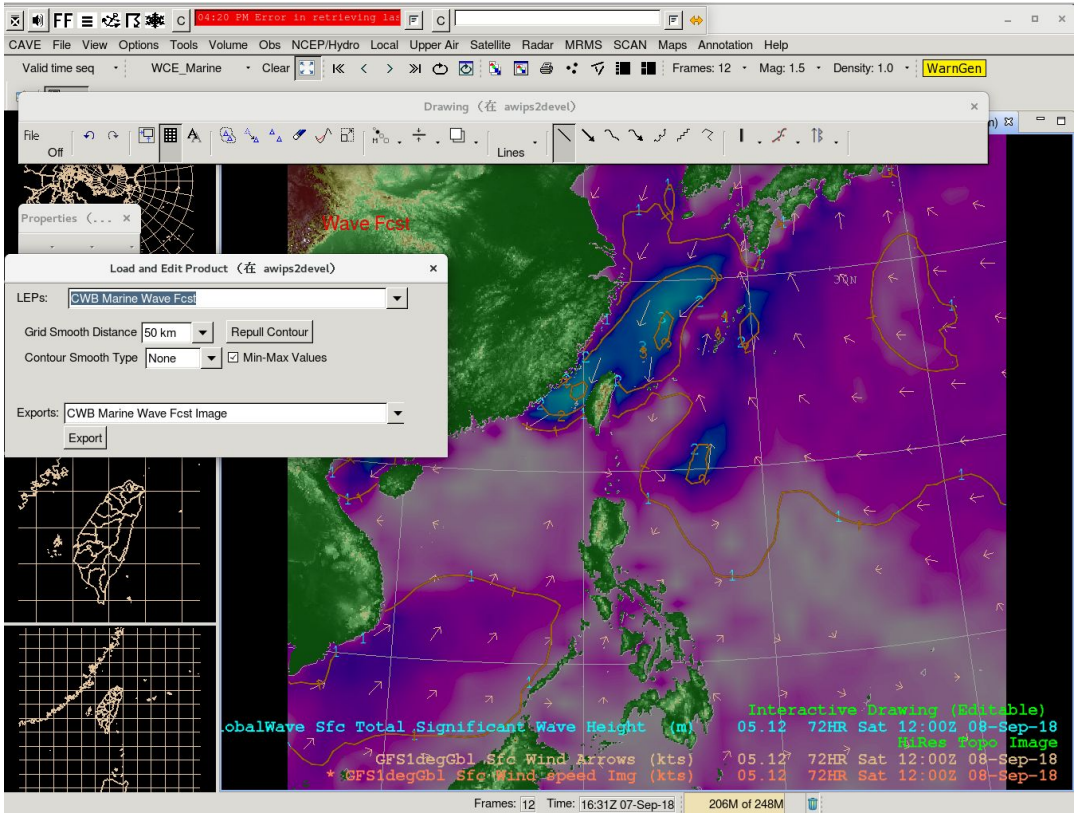




AWIPS2 CAVE Annotation Tool(CAT) (based on 17.3.1)

- LEP simulation
  - WCE_Marine Wave Fcst simulation





AWIPS2 CAT Plus features and improvement

- Provide programing access interfaces CAT to support extension/application. Current interfaces are mostly support CAT interactive GUI, but for programing need more.
- Application convenience interfaces for glyph programming. (i/o, data process)
- Load mode and frame matching. When loading a saved CAT objects fileshould with load mode options: index match, selected index(s) match, time match, selected time(s) match, all to current frame, all to all frames
- Data time control: frozen update, view history data,
- Contour label direction option: direction options: along contour or up only.
- Label overlay option: draw on top/not break line, label breaks line
- Smoothing loaded grid display interactively.
- Pull out D2D displayed contours of selected product into CAT contours.
- Display digital length match with grid value option. For example, MSLP 1023 hpa is displayed in D2D contour label as 23 and min-max as 023, but WPC weather map show it as 1023. Currently implemented a temp solution.

AWIPS2 CAT Plus features and improvement

- CWB application to make products
- CWB plugin: XML product-> CAT plot
  Improve KML/KMZ exporting with small schema set
- KML/KMZ importing with our small schema set
- Export contours as grid product
- Add more contour line styles as D2D
- Interactive Frame control: time range, selected frames, current frame

AWIPS2 CAT CWB Co-Work Development Plan Draft

- 2018 Evaluation and risk reduction
  - Requirement
  - Prototype concept
  - Evaluation work
  - Delivery evaluation version 1.0
    - Improve CAT
    - Contour pull-out and editor
    - Smooth grid and contour
    - LEP framework
- Jan 2019, delivery evaluation version 2.0
  - Improve core code
    - CWB import-export converters
    - Application interface and framework
    - Some new features

AWIPS2 CAT CWB Co-Work Development Plan Draft

- June 2019 productive version 1.0
  - Basic support operation
  - Transitional capabilities
  - Improve performance
- Dec 2019 productive version 2.0
  - Add more capabilities
  - Shutdown A1 WCE(Weather contour editor)
- June 2020 productive version 3.0
  - Advanced features
- Dec 2020 productive version 4.0, advanced
  - Full capabilities

AWIPS2 CAT CWB Co-Work Development Plan Draft

- Jan 2021 start maintenance , support , and improvement.
  - Keep update to A2 releases.
- Gradually operation at Forecast Center
- Development need 4 person years
- Maintenance Support need half person years per year