

CW3E Atmospheric River Update – Outlook

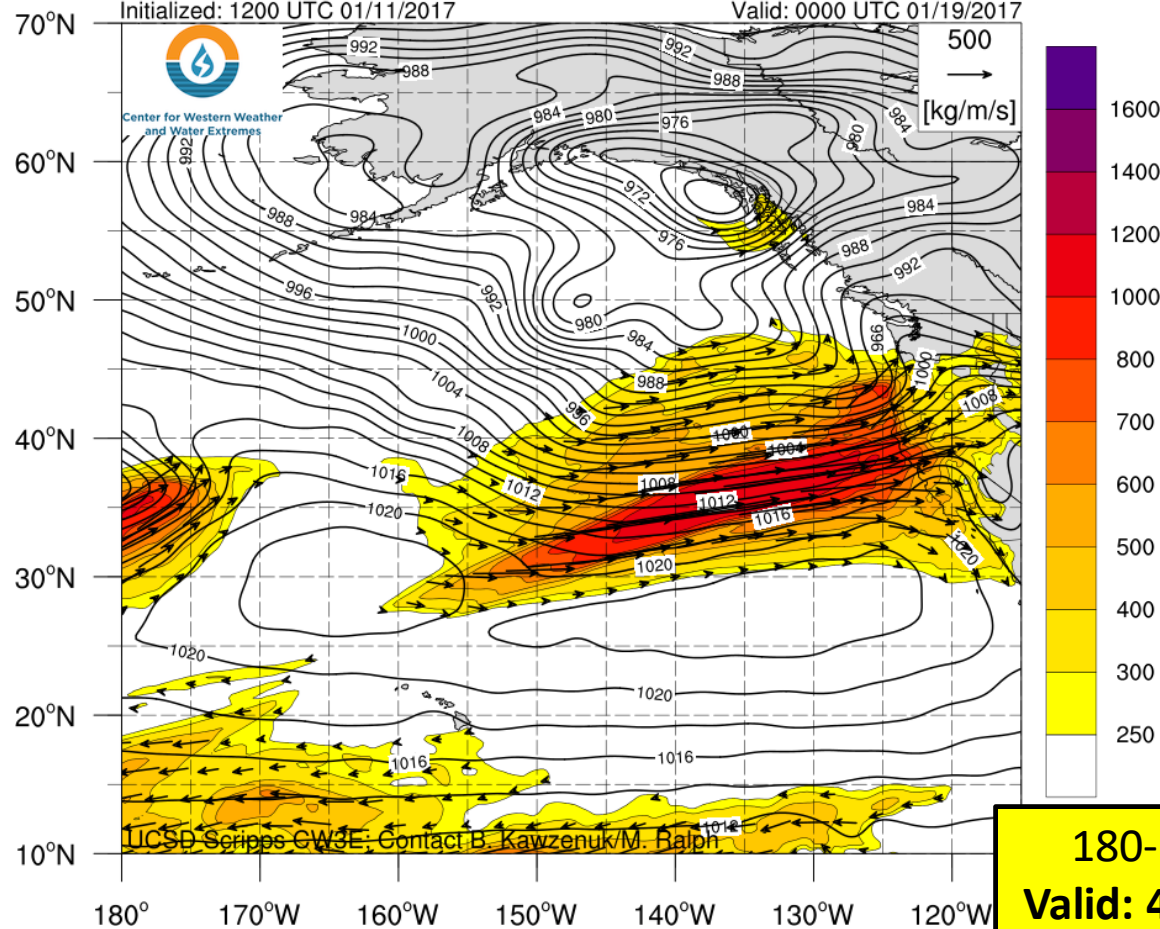


Center for Western Weather
and Water Extremes
SCRIPPS INSTITUTION OF OCEANOGRAPHY
AT UC SAN DIEGO

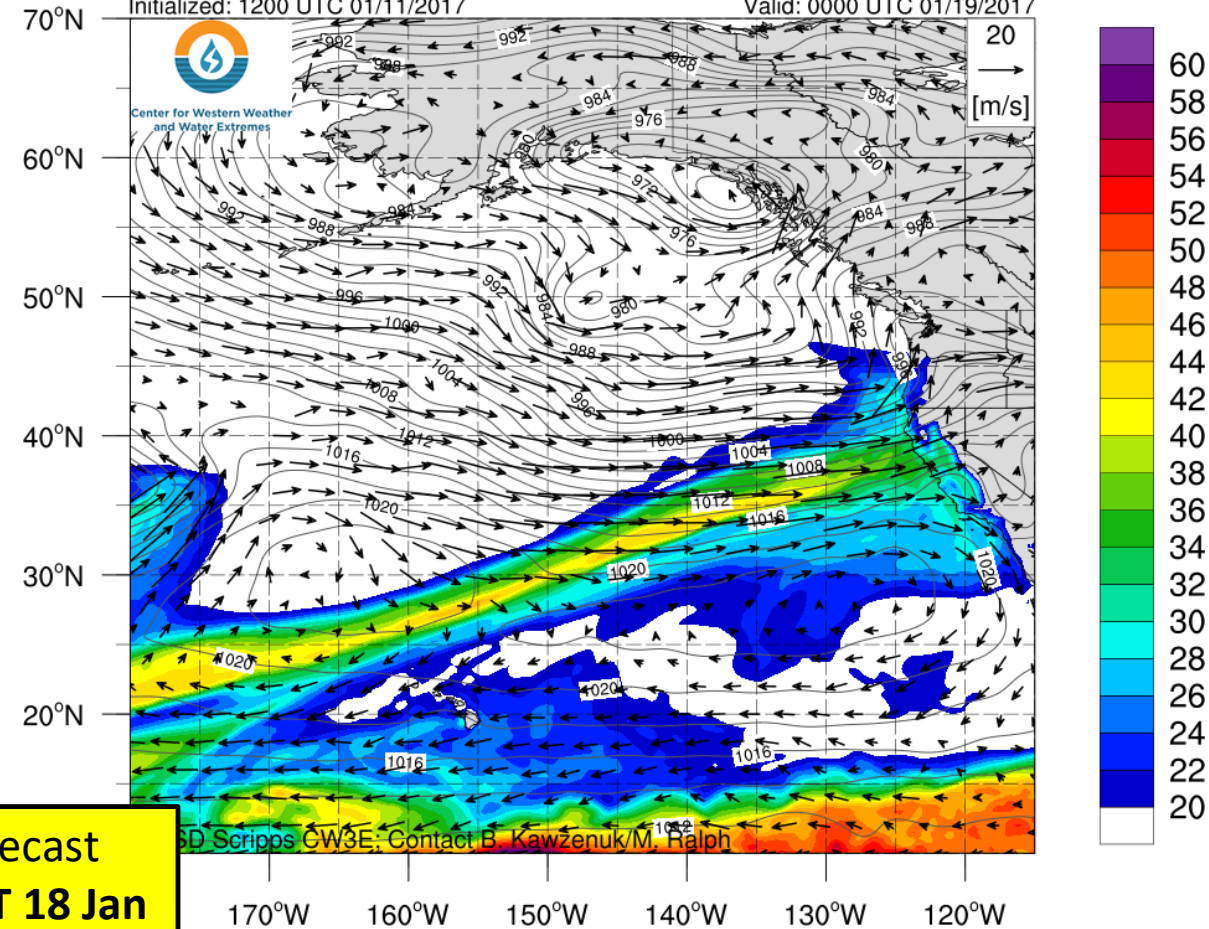
Long range forecast shows potential for strong AR to make landfall over CA next week

- GFS model suggests the landfall of a strong AR over the U.S. West Coast in forecast days 6 – 9 (17 – 20 January 2017)
- Current model runs predict AR to make landfall over Pacific Northwest before propagating south over CA
- Ensemble models show **large uncertainties** and **low forecast confidence** in AR strength and location

NCEP GFS IVT ($\text{kg m}^{-1} \text{s}^{-1}$; shaded), IVT Vector, and SLP (hPa; contours)
Initialized: 1200 UTC 01/11/2017 Valid: 0000 UTC 01/19/2017



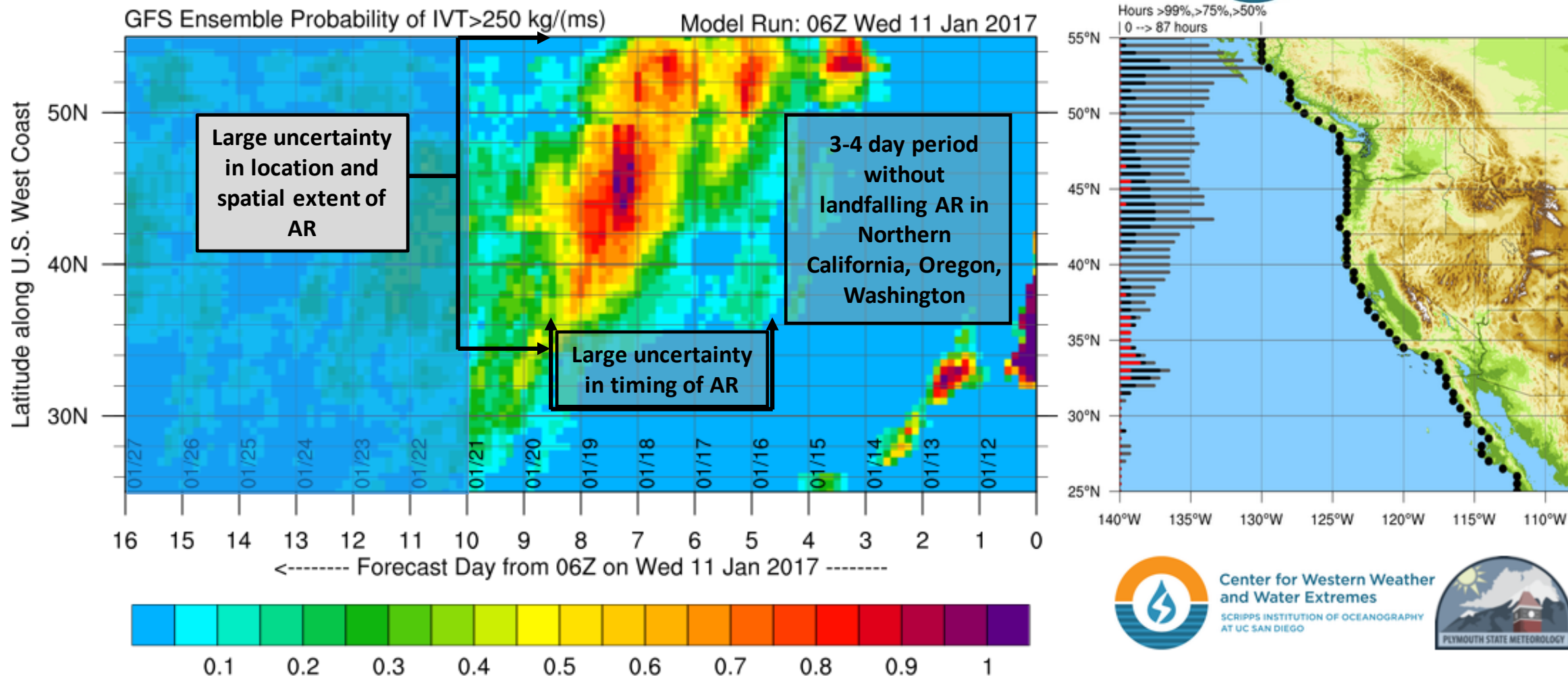
NCEP GFS IWV (mm; shaded), 850-hPa Wind (vectors), and SLP (hPa; contours)
Initialized: 1200 UTC 01/11/2017 Valid: 0000 UTC 01/19/2017



CW3E Atmospheric River Update – Outlook



Center for Western Weather and Water Extremes
SCRIPPS INSTITUTION OF OCEANOGRAPHY AT UC SAN DIEGO



Center for Western Weather and Water Extremes
SCRIPPS INSTITUTION OF OCEANOGRAPHY AT UC SAN DIEGO

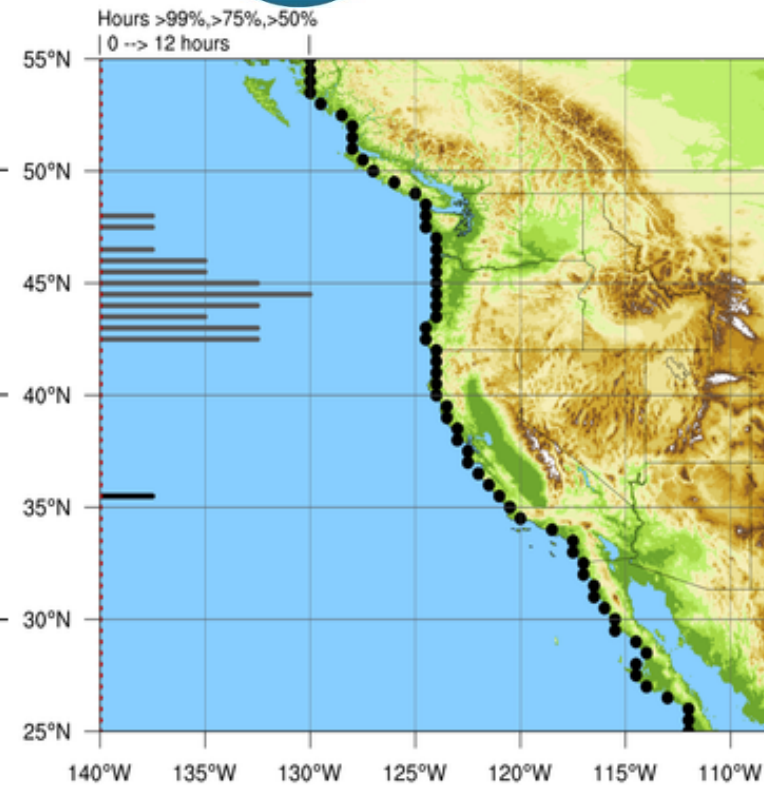
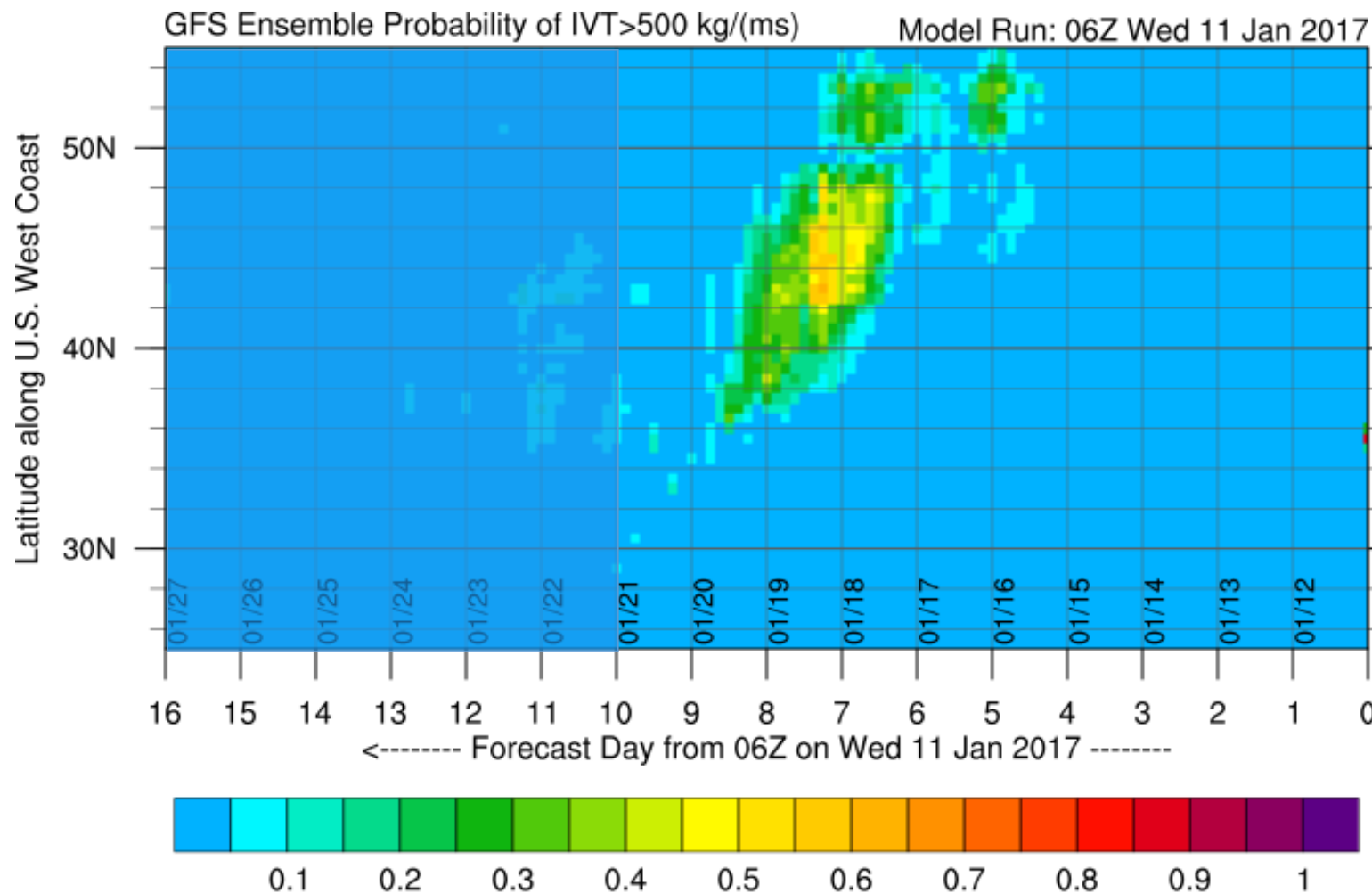


- Large temporal and spatial region showing moderate confidence (>75% of ensemble members) of at least minimal AR conditions (IVT >250 kg m⁻¹ s⁻¹) during 16 – 20 January 2017
- Large uncertainties in timing and location of AR

CW3E Atmospheric River Update – Outlook



Center for Western Weather and Water Extremes
SCRIPPS INSTITUTION OF OCEANOGRAPHY
AT UC SAN DIEGO



Center for Western Weather and Water Extremes
SCRIPPS INSTITUTION OF OCEANOGRAPHY
AT UC SAN DIEGO



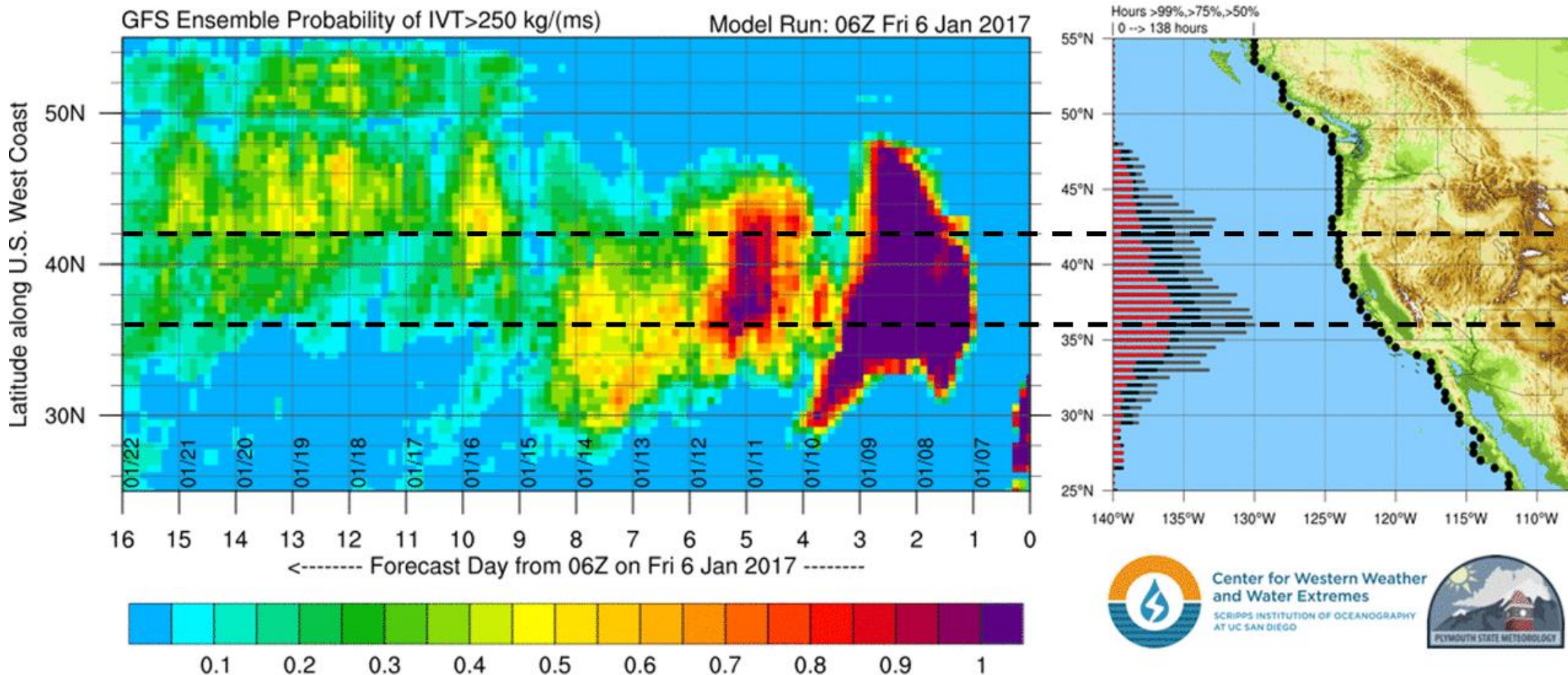
Low confidence (<75% of ensemble members) of moderate AR conditions ($IVT > 500 \text{ kg m}^{-1} \text{ s}^{-1}$) during 17 – 18 January

CW3E Atmospheric River Update – Outlook



Center for Western Weather and Water Extremes
SCRIPPS INSTITUTION OF OCEANOGRAPHY
AT UC SAN DIEGO

A look back at how the forecasts changed ahead of and during the active AR landfall period from 8-11 January (dProg/dT) and for next possible AR landfall next week
Forecasts initialized 0600 UTC 4 Jan – 0600 UTC 11 Jan



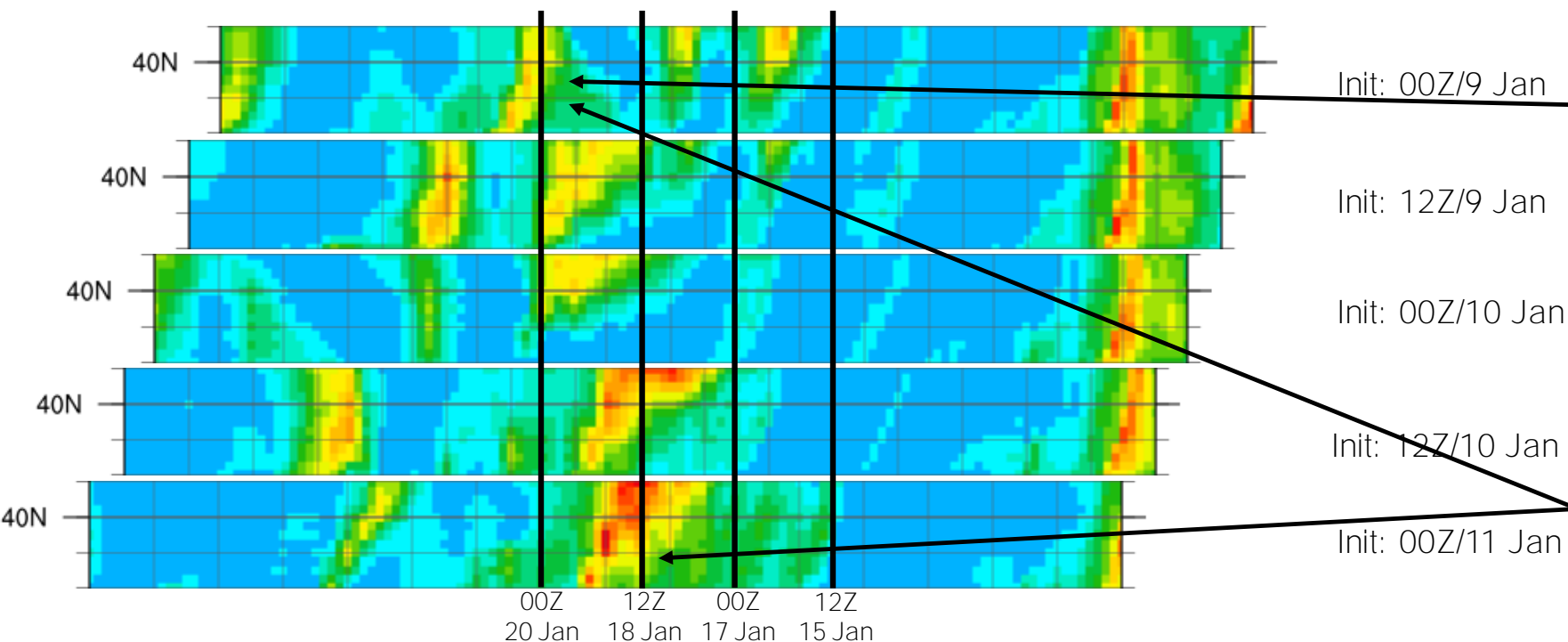
CW3E Atmospheric River Update – Outlook



Center for Western Weather and Water Extremes
SCRIPPS INSTITUTION OF OCEANOGRAPHY
AT UC SAN DIEGO

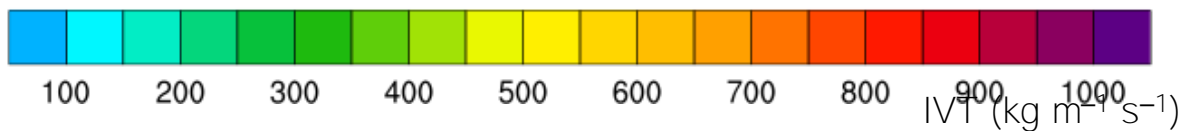
Development of forecast (dProg/dT) – Global Forecast System (GFS)

Forecasts initialized 0000 UTC 8 Jan – 0000 UTC 11 Jan



AR first detected to impact CA in GFS initialized 0000 UTC 9 Jan (~10 lead time)

Intensity of AR and southern extent of AR has increased in each model run over the previous 60 hours. Landfall has also shifted earlier.



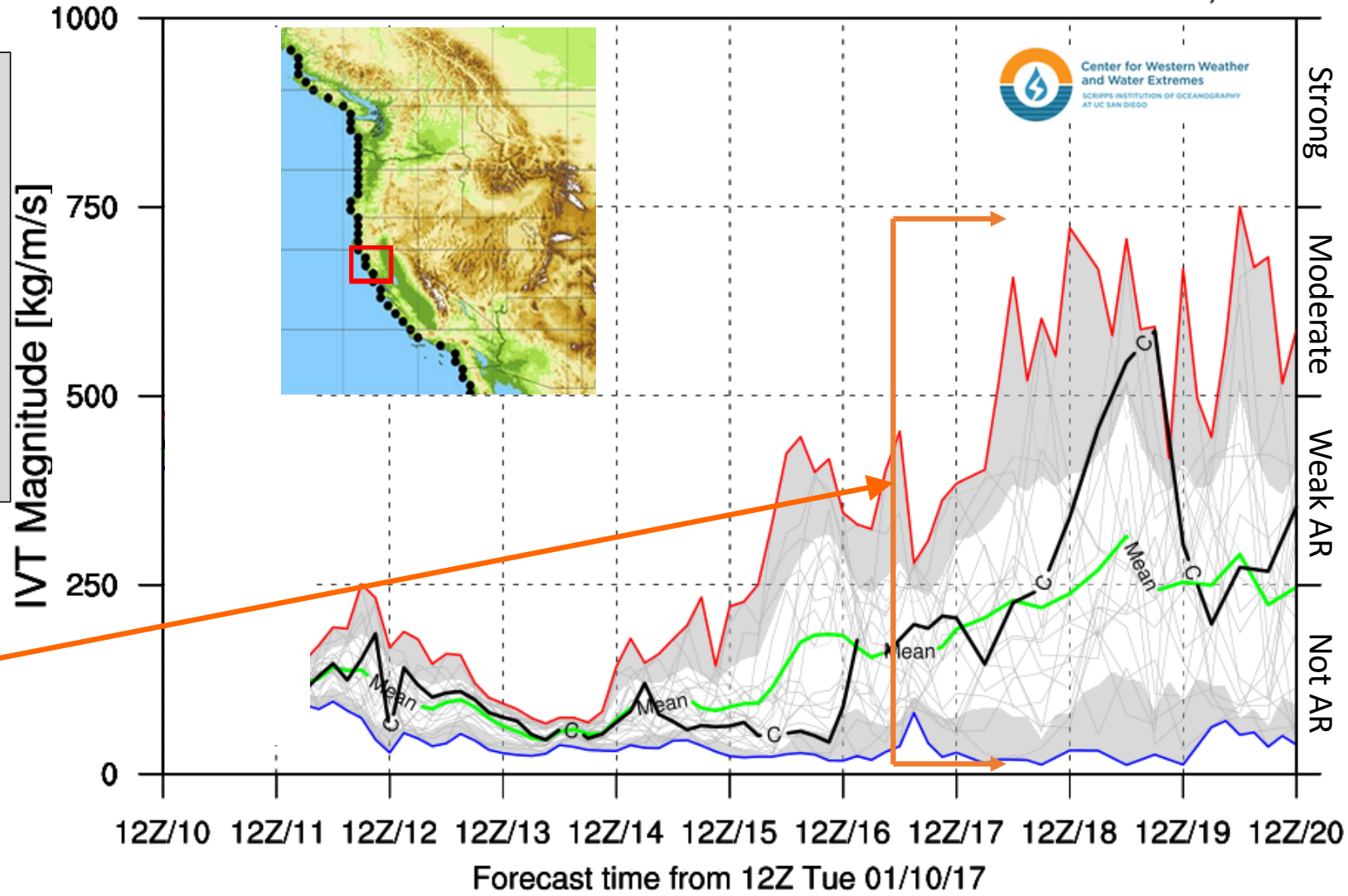
CW3E Atmospheric River Update – Outlook



Center for Western Weather and Water Extremes
 SCRIPPS INSTITUTION OF OCEANOGRAPHY
 AT UC SAN DIEGO

GFS Ensemble Init: 12Z Tue 01/10/17

LatLon: 38N;123W



- Forecasts range from no AR making landfall, up to moderate AR conditions lasting >24 hours
- Uncertainty in forecast is very large in strength, timing, and presence of AR conditions
- GFS control member (black line) indicates AR conditions stronger than the majority of ensemble members indicate

Potential Magnitude of AR

- Maximum possible IVT $\sim 750 \text{ kg m}^{-1} \text{ s}^{-1}$
- Mean IVT $\sim 300 \text{ kg m}^{-1} \text{ s}^{-1}$

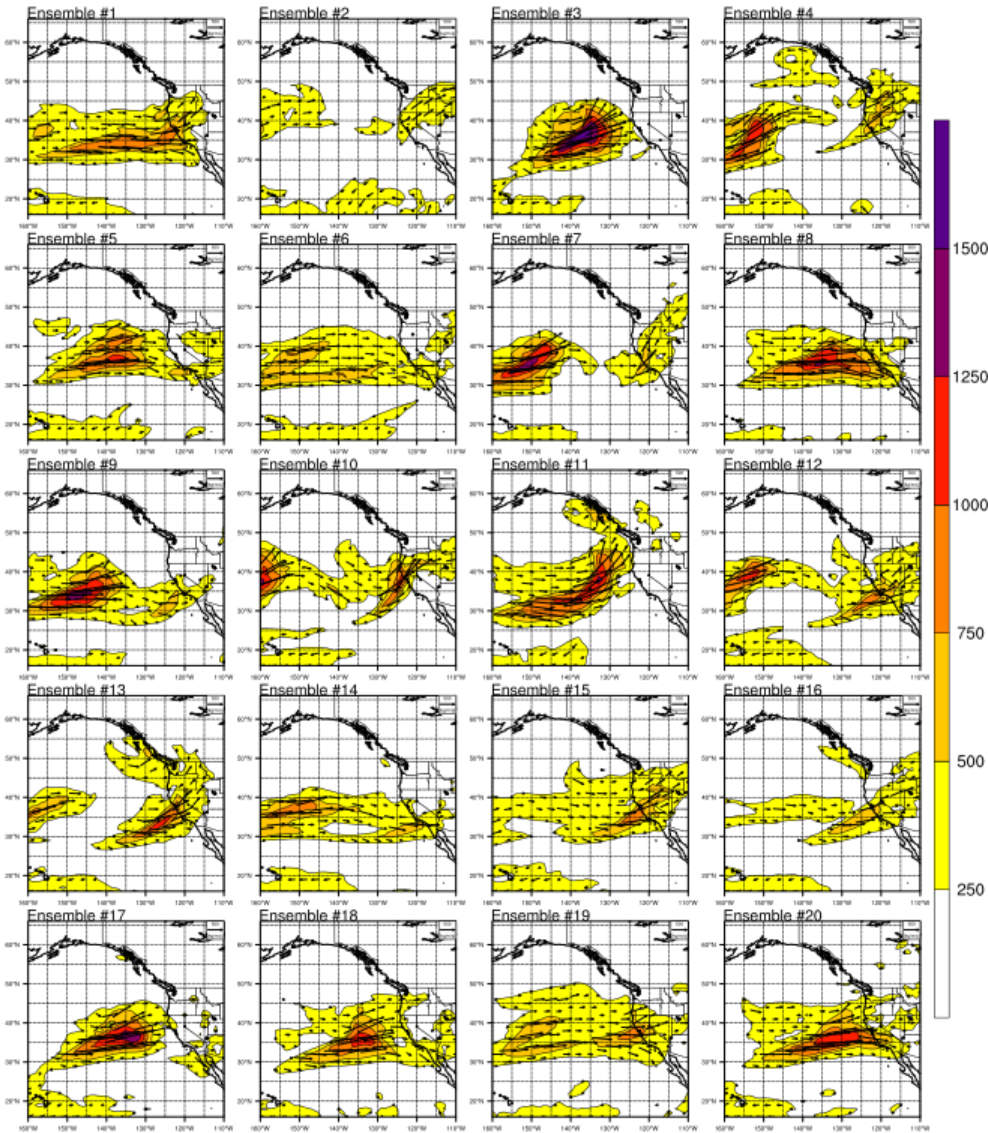
CW3E Atmospheric River Update – Outlook



Center for Western Weather
and Water Extremes
SCRIPPS INSTITUTION OF OCEANOGRAPHY
AT UC SAN DIEGO

GEFS Ensemble Members: Valid 4AM 19 Jan

GEFS Ensemble IVT (kg/m/s) valid 12Z Thu 01/19/17 | F+192h



- All GEFS ensemble members show the presence of an AR in the Northeast Pacific on 19 January 2017
- There is large variability in AR location and strength among GEFS members
- Impacts to CA vary significantly between the different AR outcomes in the GEFS members

Due to this variability, forecast confidence of an AR impacting CA during 17 – 20 January is low