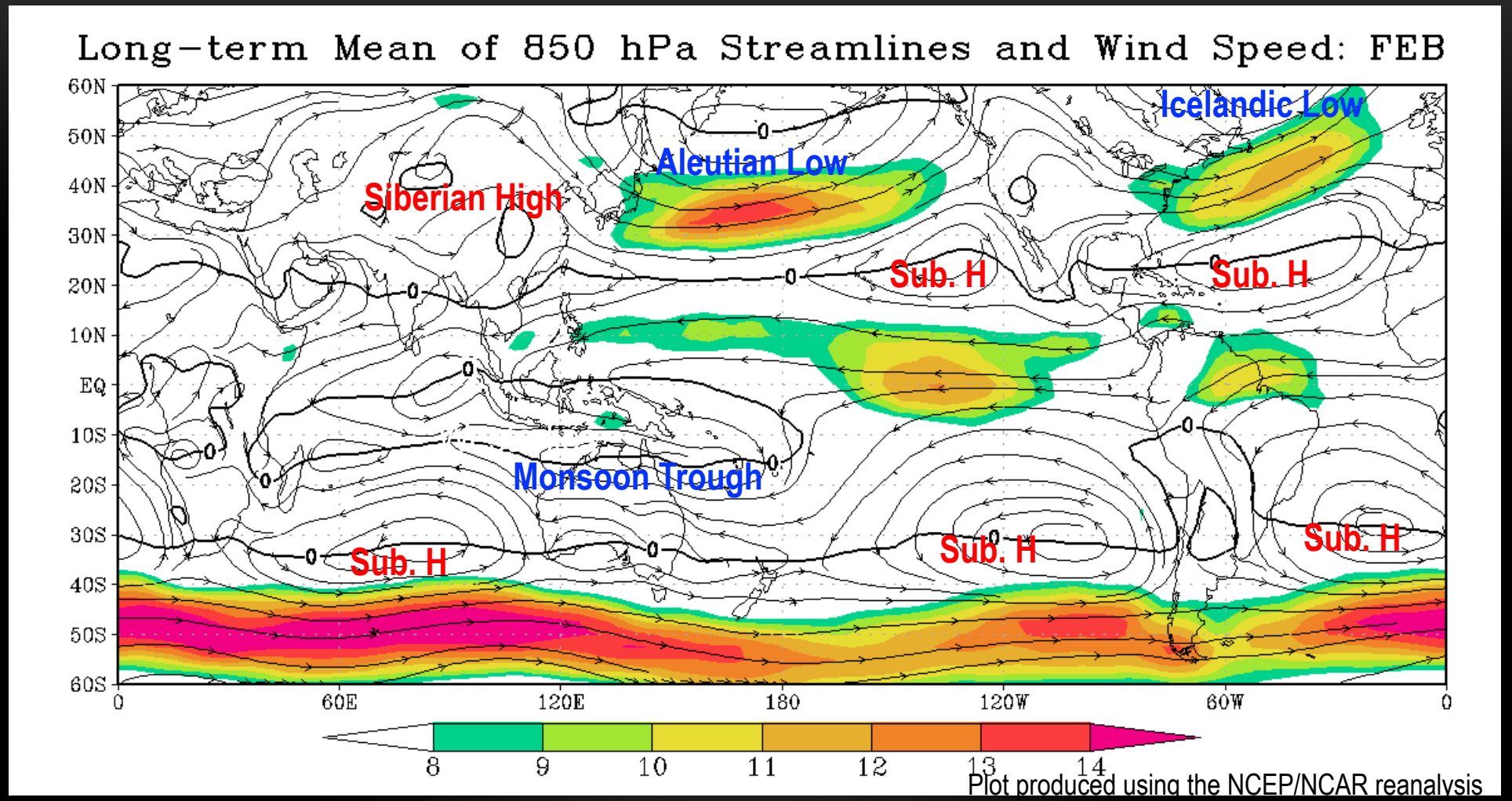
Atmospheric General Circulation: Major Pressure Systems

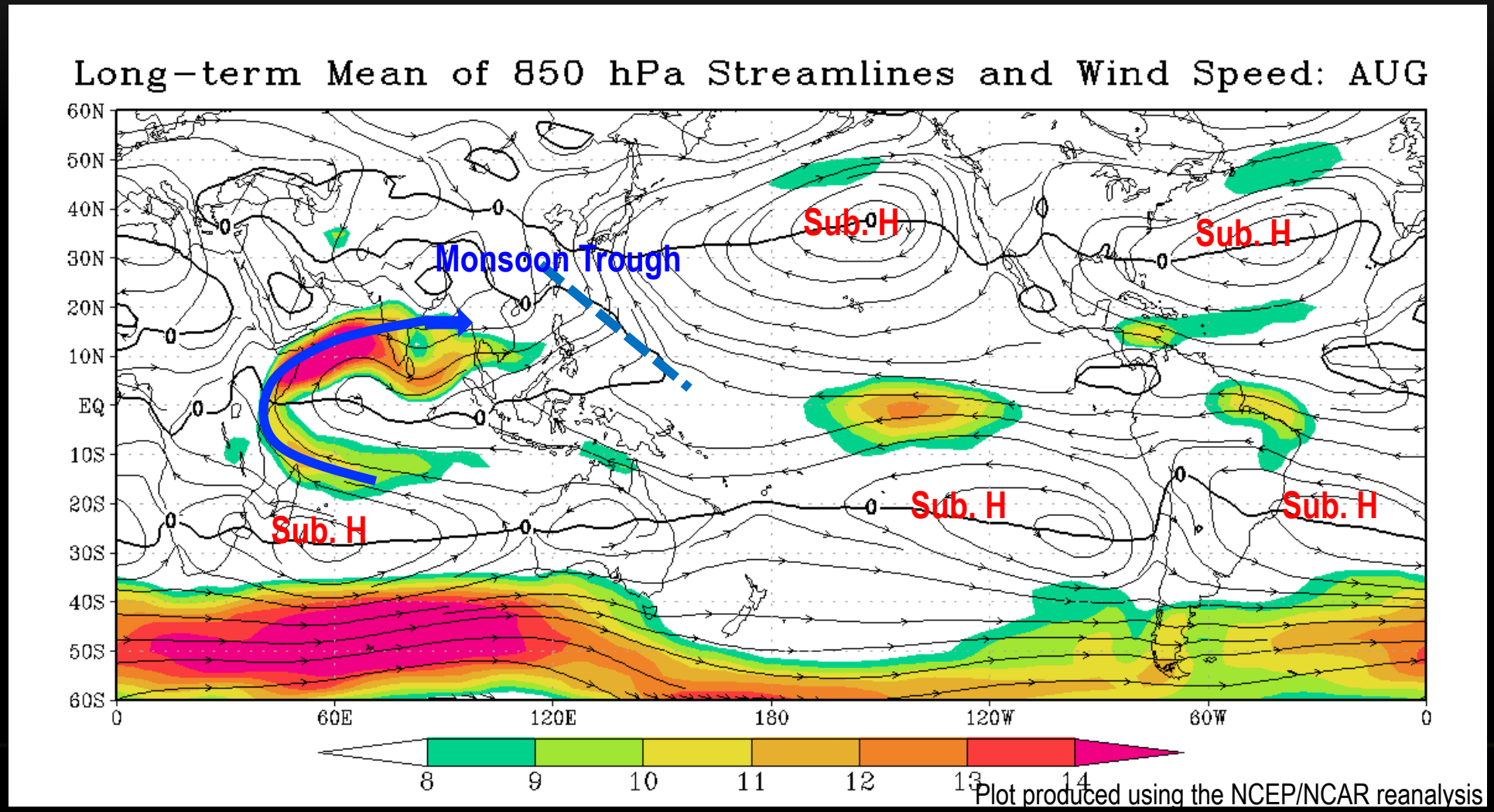
Long-Term Mean 850 hPa wind: Feb



What major circulation systems do you see?

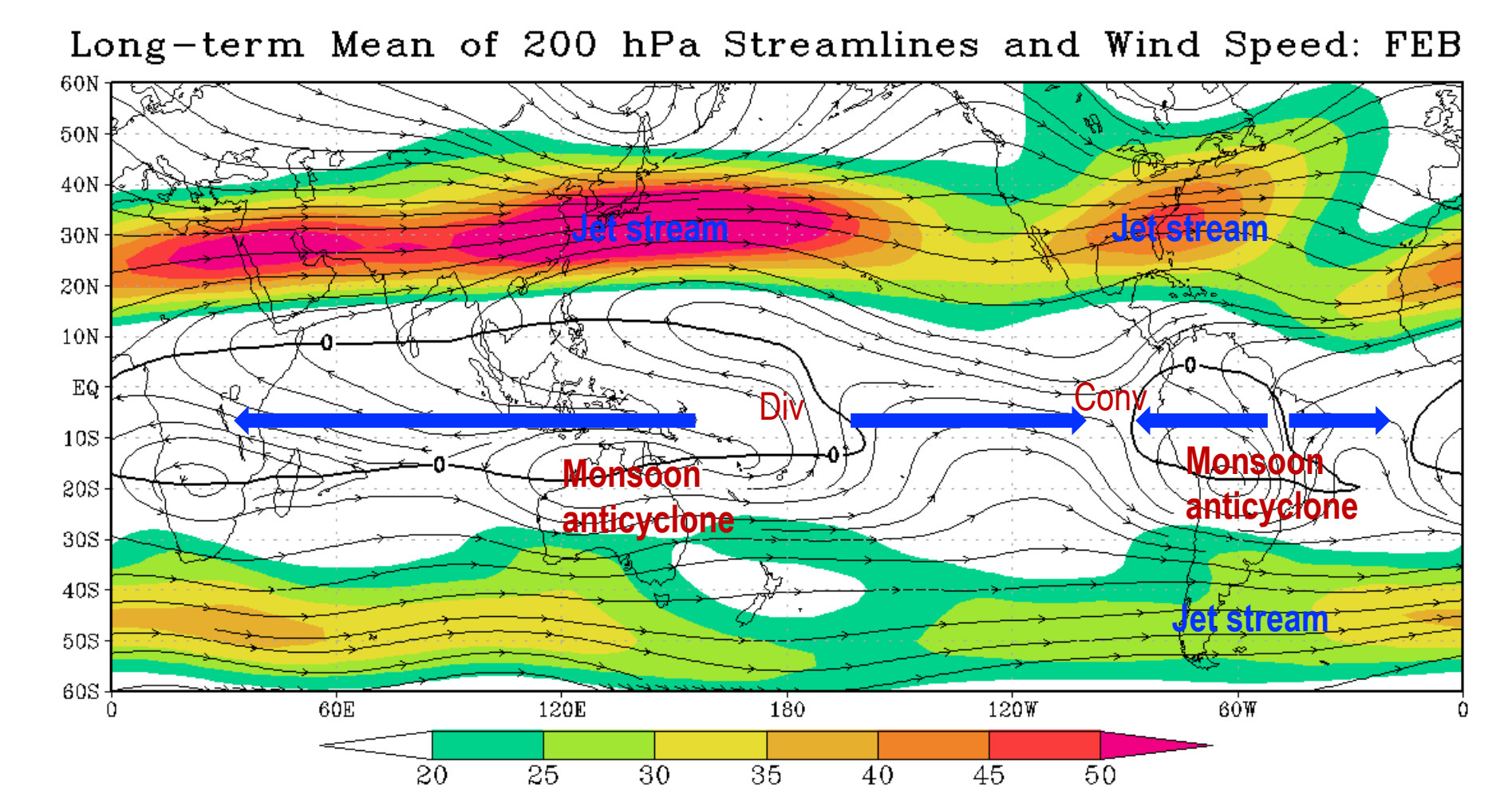
- Monsoons are characterized by a low-level cyclonic circulation.
- Subtropical highs are located in the descending branches of the Hadley circulation
- The winter hemisphere is characterized by low-level highs over cold continents and low-level lows over warm oceans in the extratropics. The low-level flow is also shaped by topography.

Long-Term Mean 850 hPa Wind: Aug



Plot produced using the NCEP/NCAR reanalysis

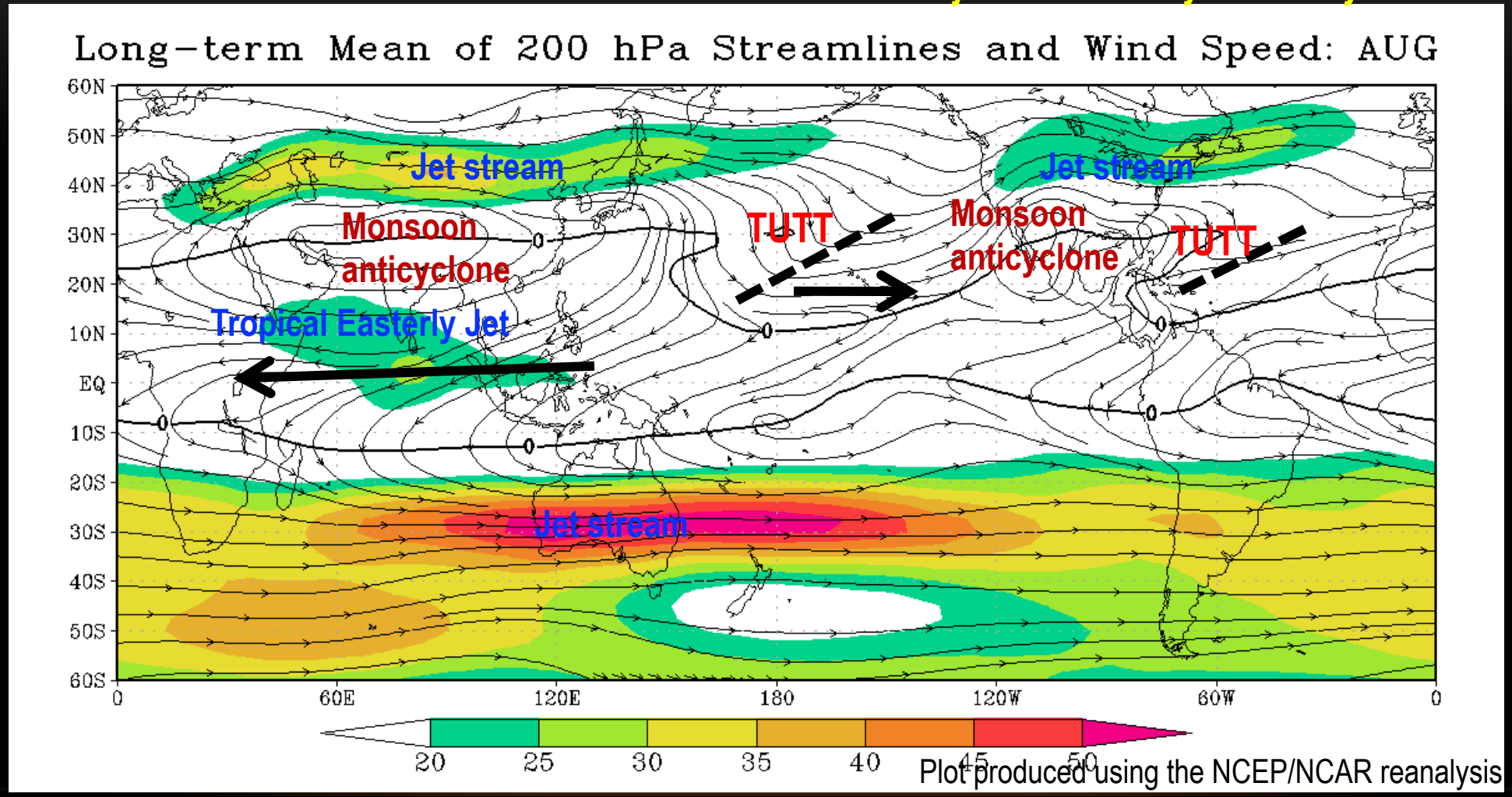
Long-Term Mean 200 hPa Wind: Feb



- The jet stream is stronger in the winter hemisphere but more zonally “uniform” in the southern hemisphere
- Upper-level monsoon anticyclones
- The upper-level zonal wind in the tropics is consistent with the Walker circulation.
- The equatorial westerlies (U>0) are important for cross-equatorial teleconnection between the two hemispheres.

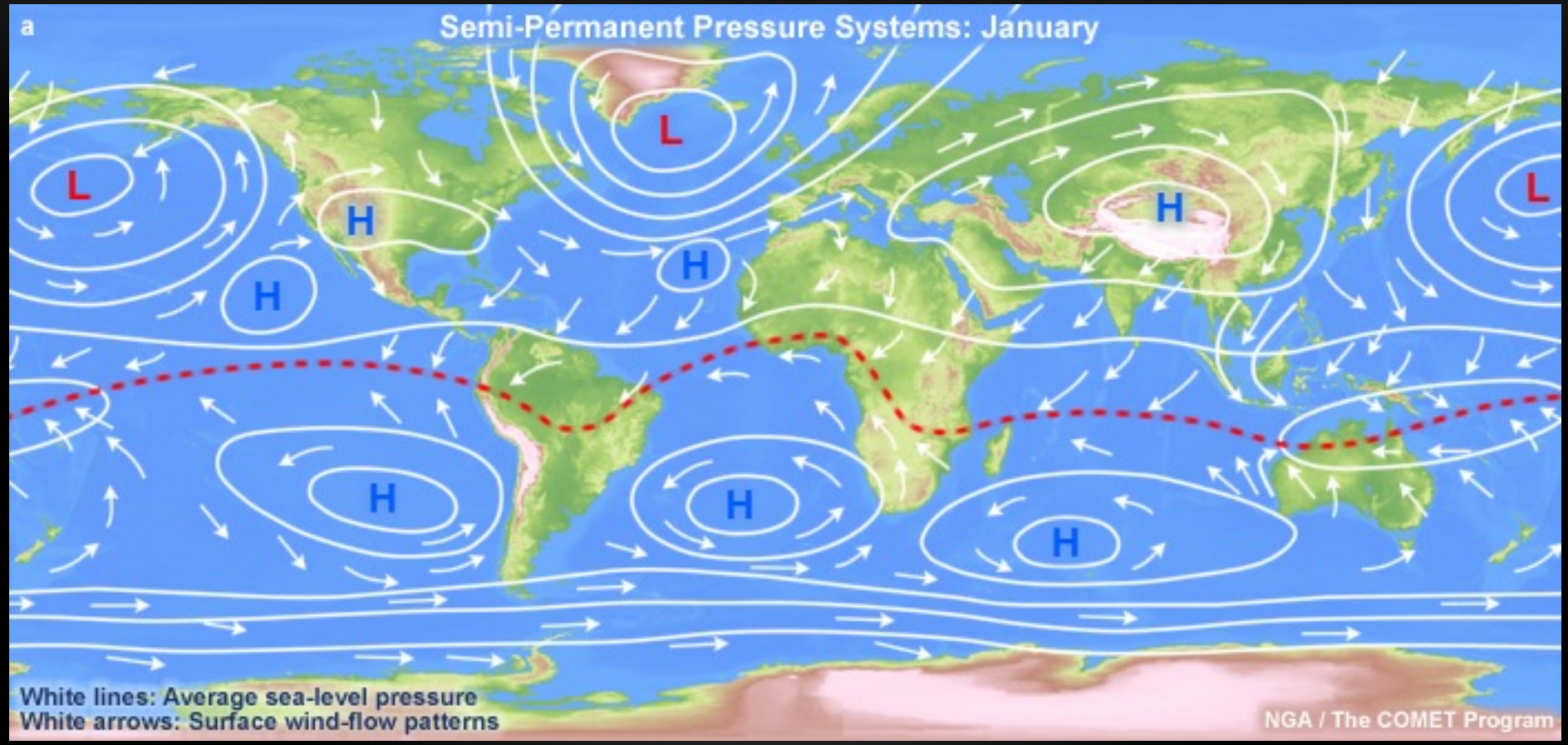
Long-Term Mean 200 hPa Wind: Aug

What major circulation systems do you see?

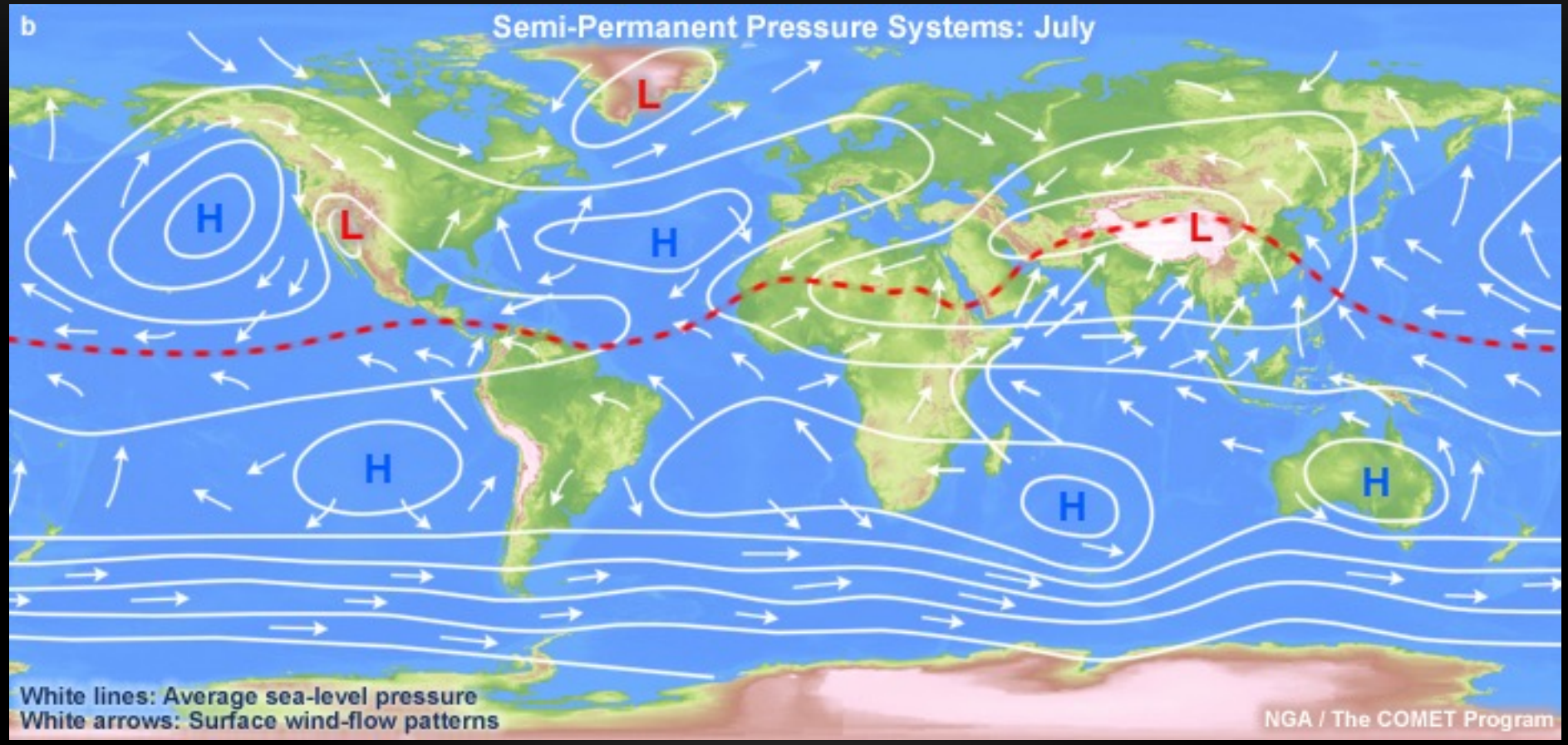


- The NH jets are much weaker in summer and shift poleward; a strong, zonal jet in the SH.
- Anticyclones are present over the major monsoon systems.
- Mid-ocean troughs or tropical upper-tropospheric troughs (TUTTs) are important for tropics-extratropics interaction

Semi-Permanent Surface Pressure Systems: Jan



Semi-Permanent Surface Pressure Systems: July



References

- Cook, K. H., 2013: section 2.1
- COMET MetED: Introduction to Tropical Meteorology, 2nd Edition, Chapter 3: Global Circulation. Understanding Assimilation Systems: How Models Create Their Initial Conditions - version 2. The source of this material is the COMET® Website at http://meted.ucar.edu/ of the University Corporation for Atmospheric Research (UCAR), sponsored in part through cooperative agreement(s) with the National Oceanic and Atmospheric Administration (NOAA), U.S. Department of Commerce (DOC) ©1997-2010 University Corporation for Atmospheric Research. All Rights Reserved.