

Tormentas de invierno Chile centro-sur

René D. Garreaud

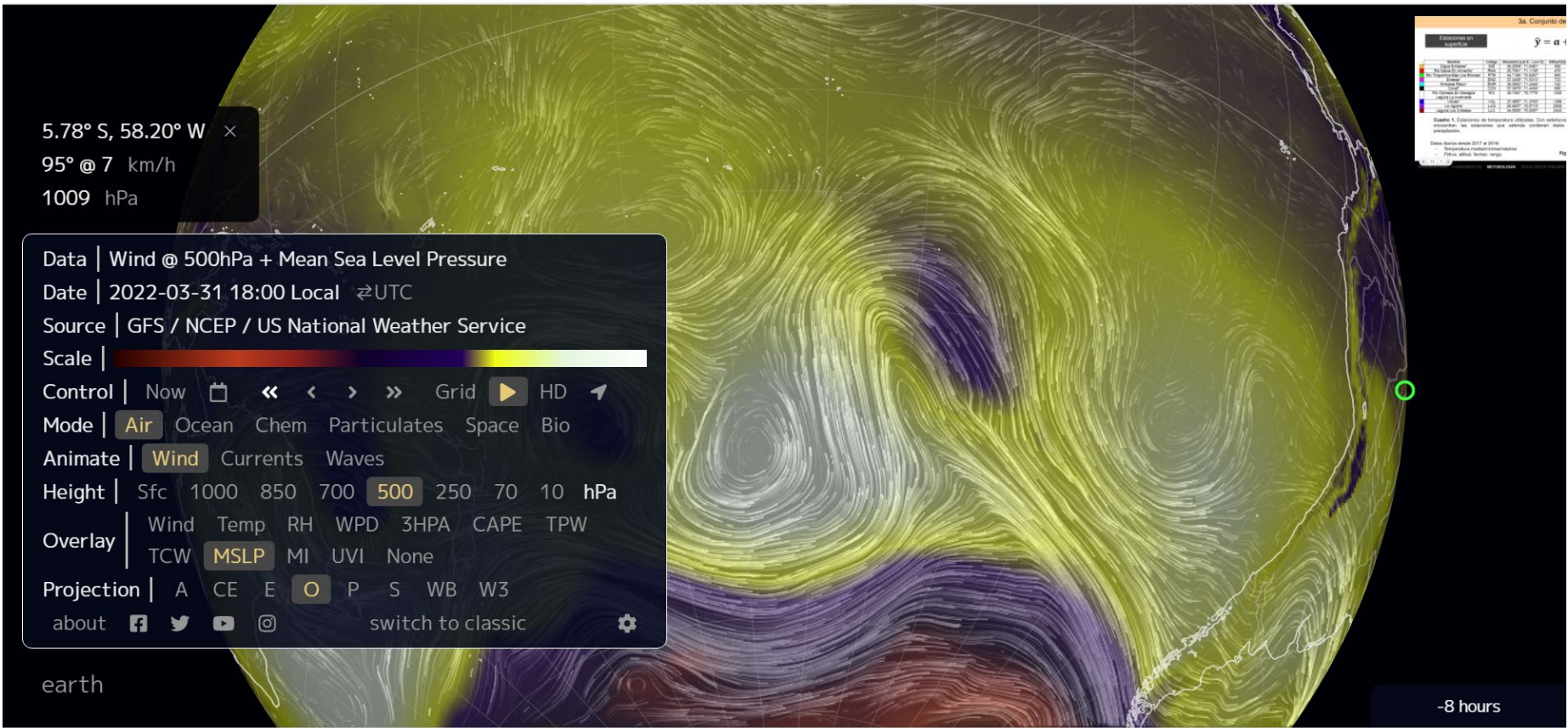
Departamento de Geofísica

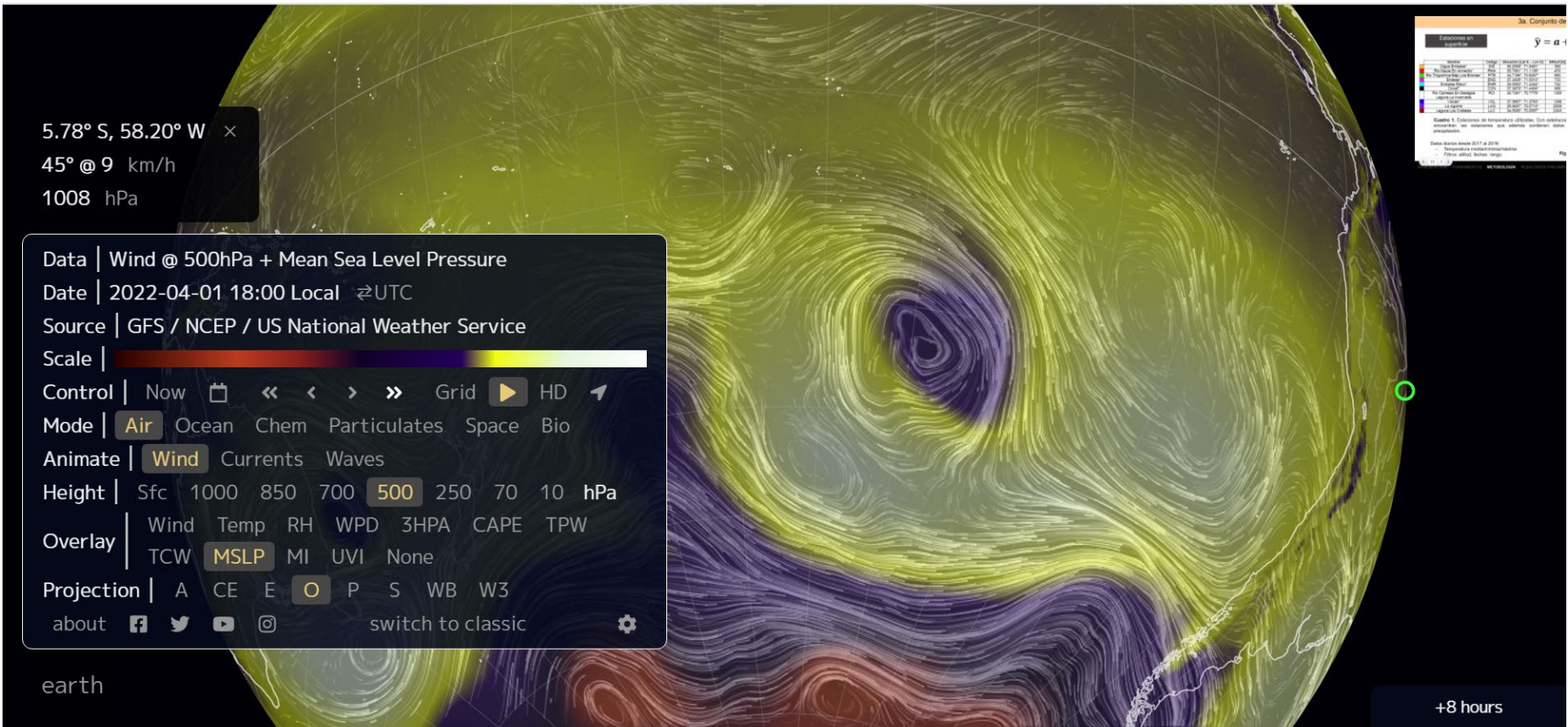
Universidad de Chile



Super Ciclogenesia

01 Abril 2022





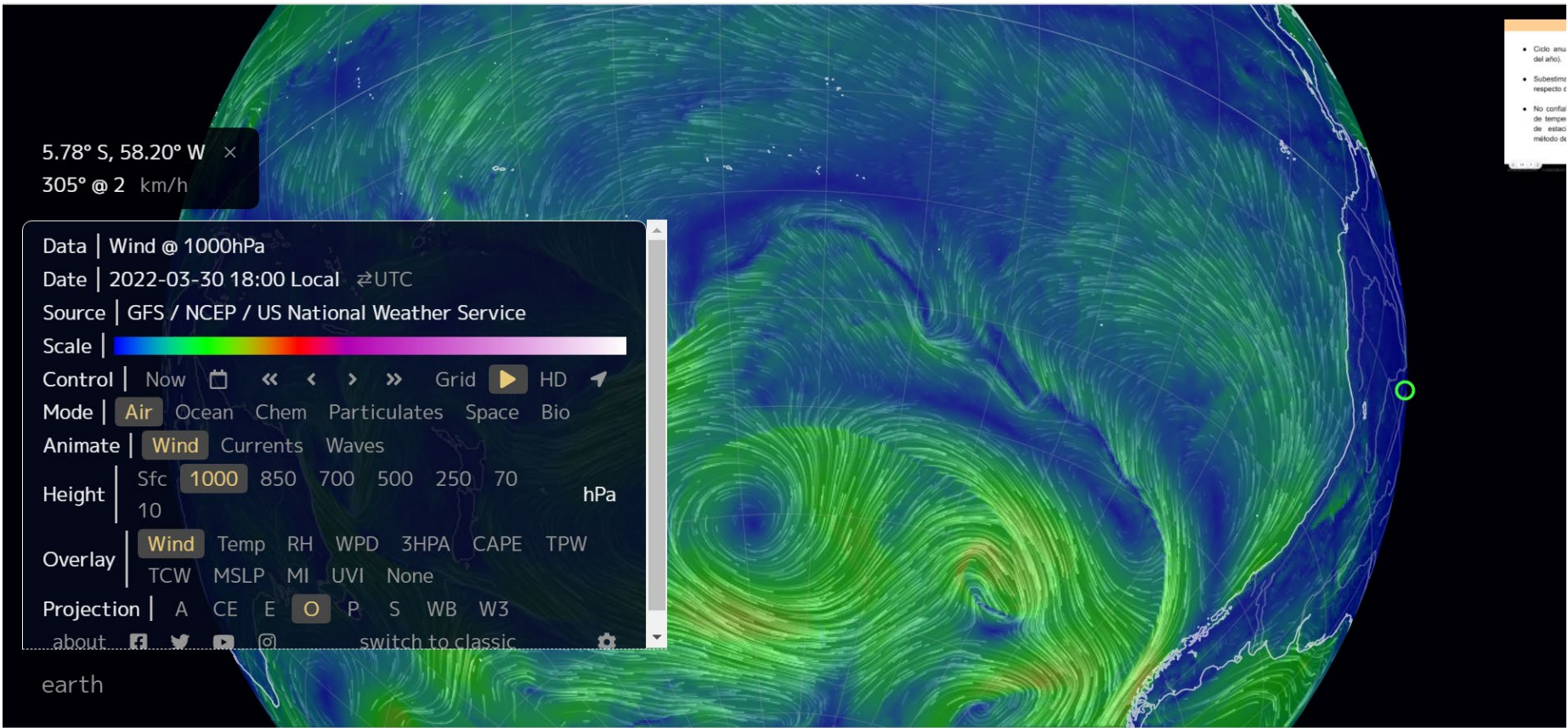
3a. Conjunto de

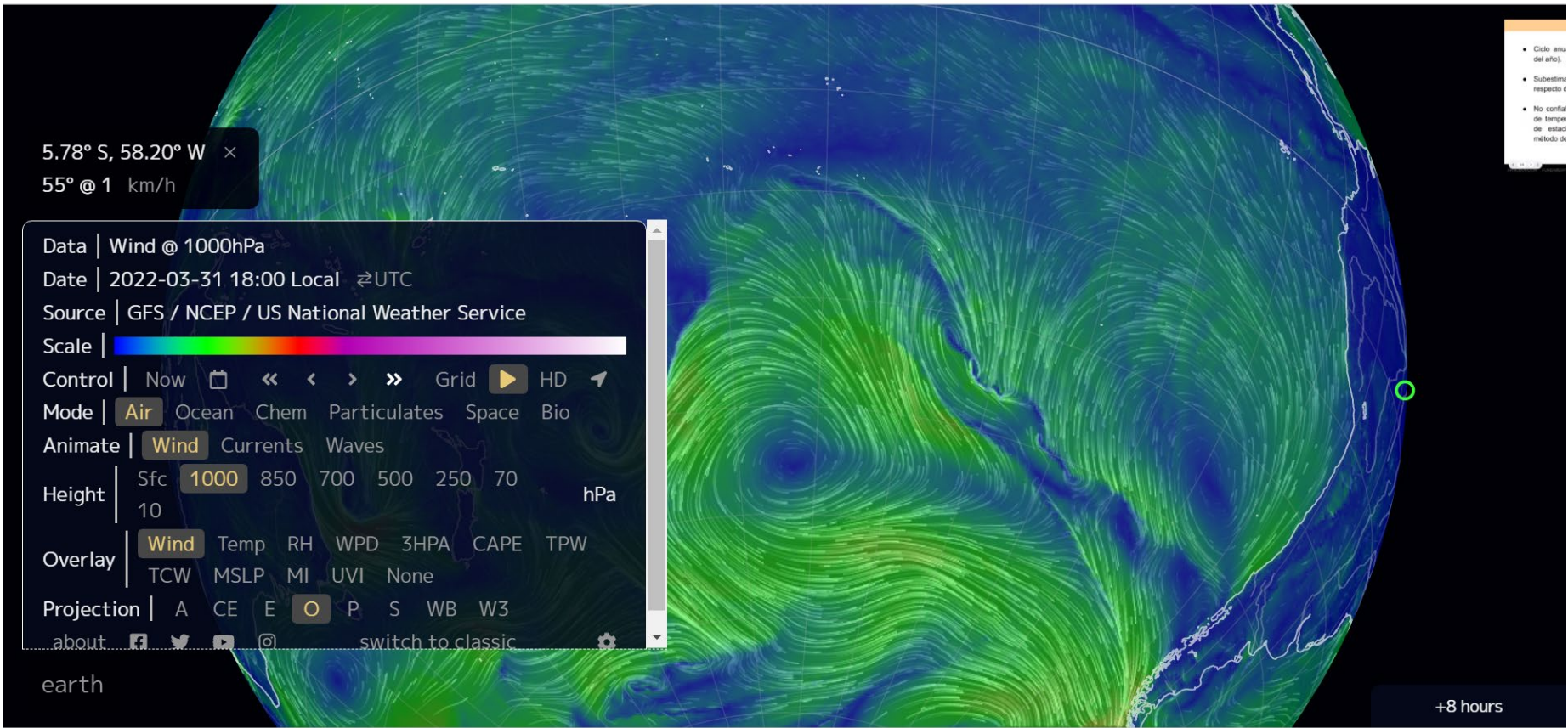
Estaciones en

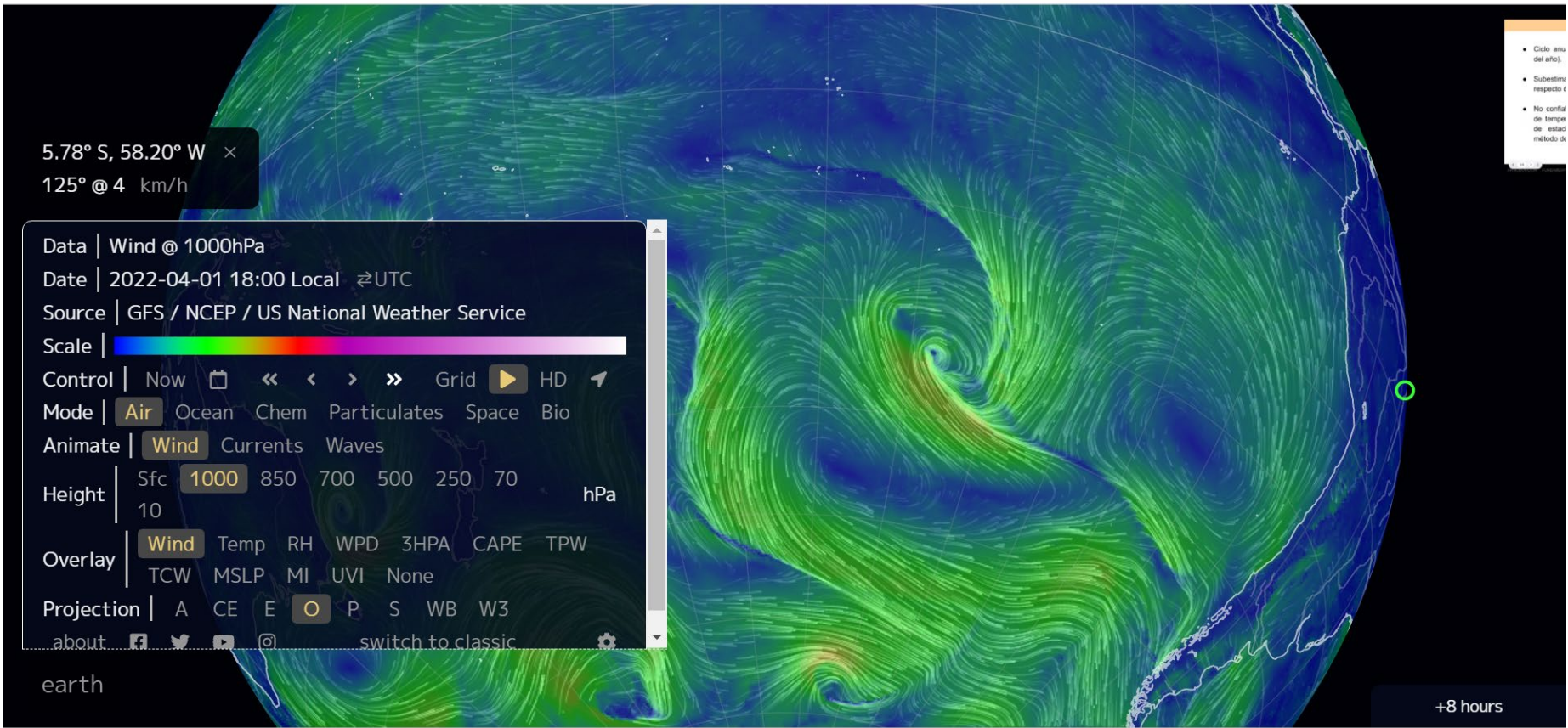
$y = a + b$

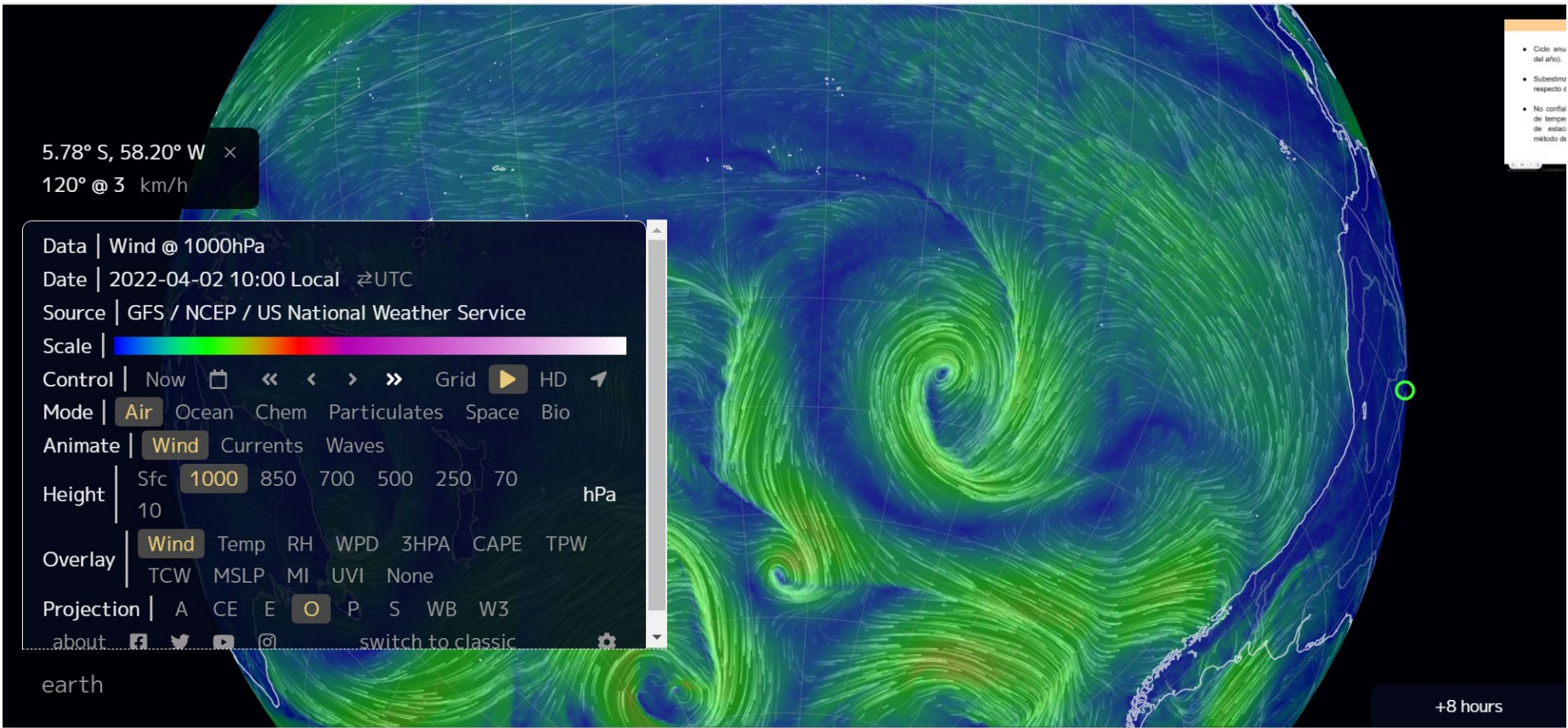
Nombre	Lat	Long	Altitud	Temperatura	Presión	Viento	Humedad	Neve	Pluvió
San Pedro de Macoris	18.45	-70.50	100	28.0	1013.0	10.0	75.0	0.0	0.0
San Juan de los Rios	18.45	-70.50	100	28.0	1013.0	10.0	75.0	0.0	0.0
San Juan de los Rios	18.45	-70.50	100	28.0	1013.0	10.0	75.0	0.0	0.0
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San Juan de los Rios	18.45	-70.50	100	28.0	1013.0	10.0	75.0	0.0	0.0
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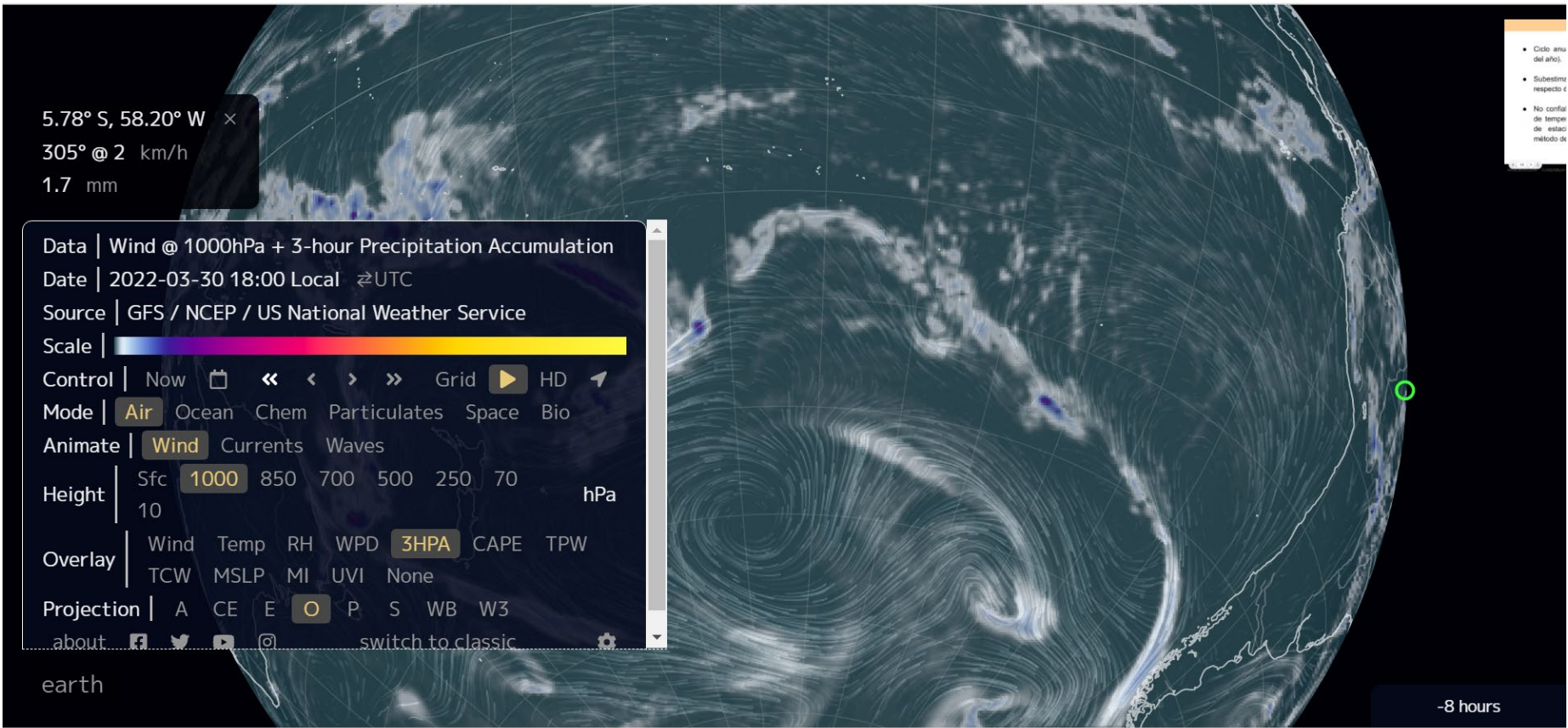
Datos desde 2017 a 2018
 - Temperatura máxima y mínima
 - Precipitación máxima y mínima
 - Viento máximo y mínimo

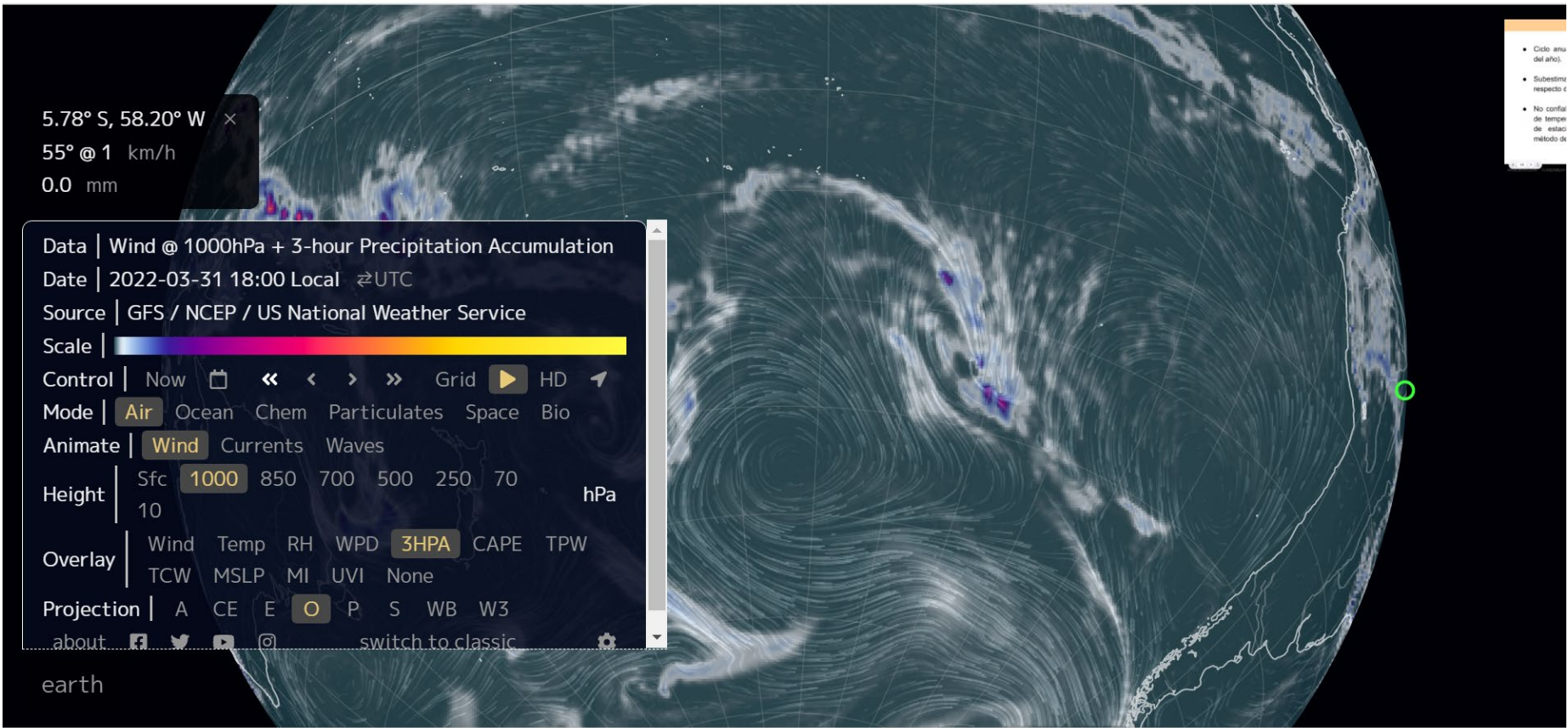


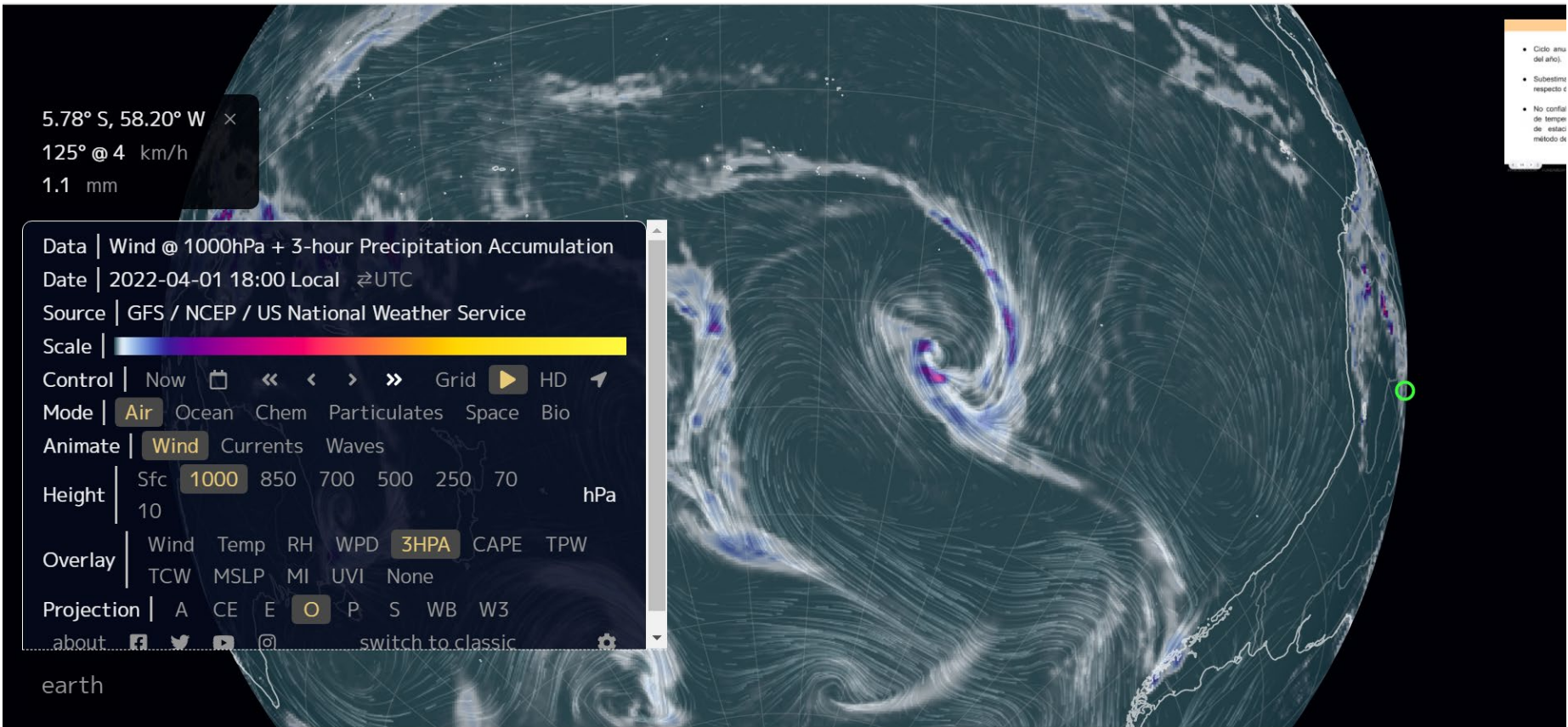


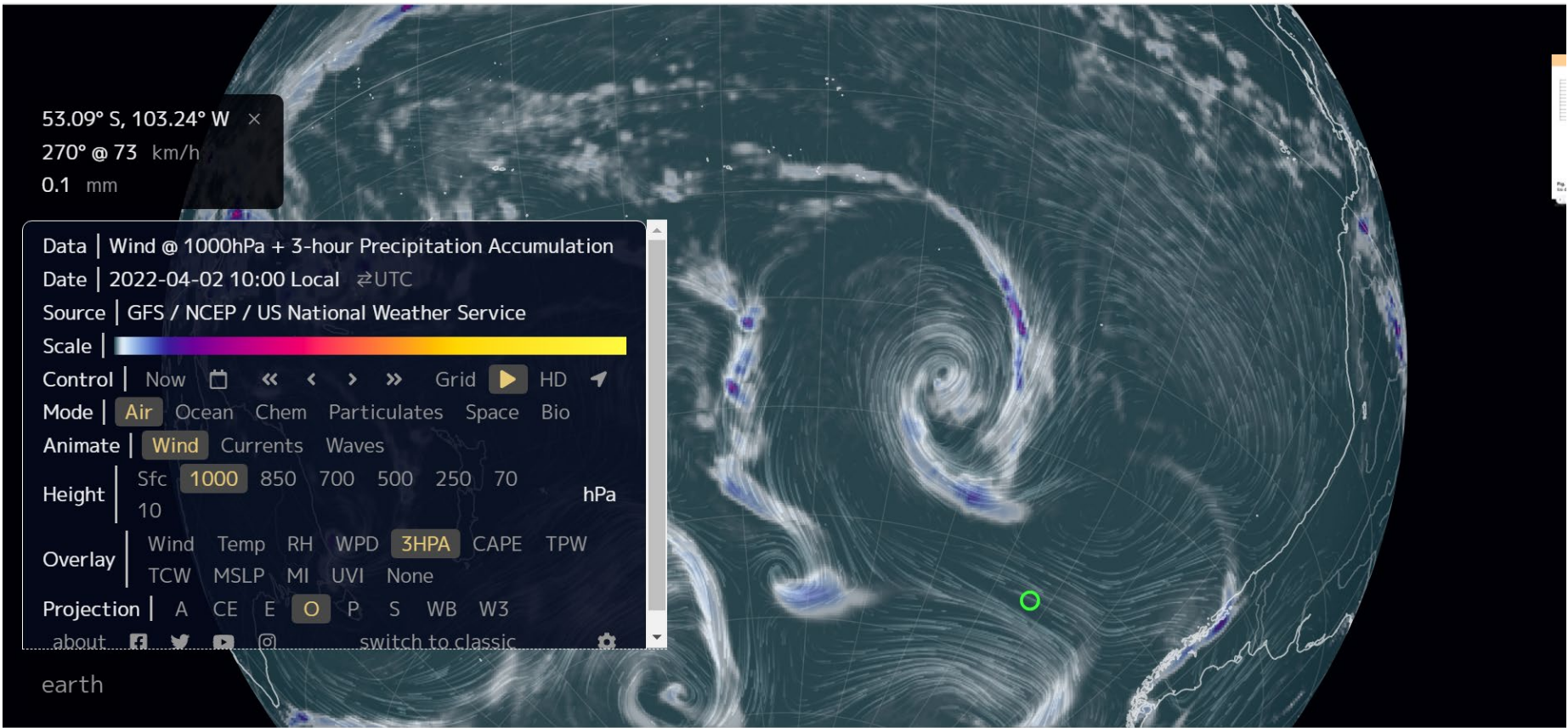






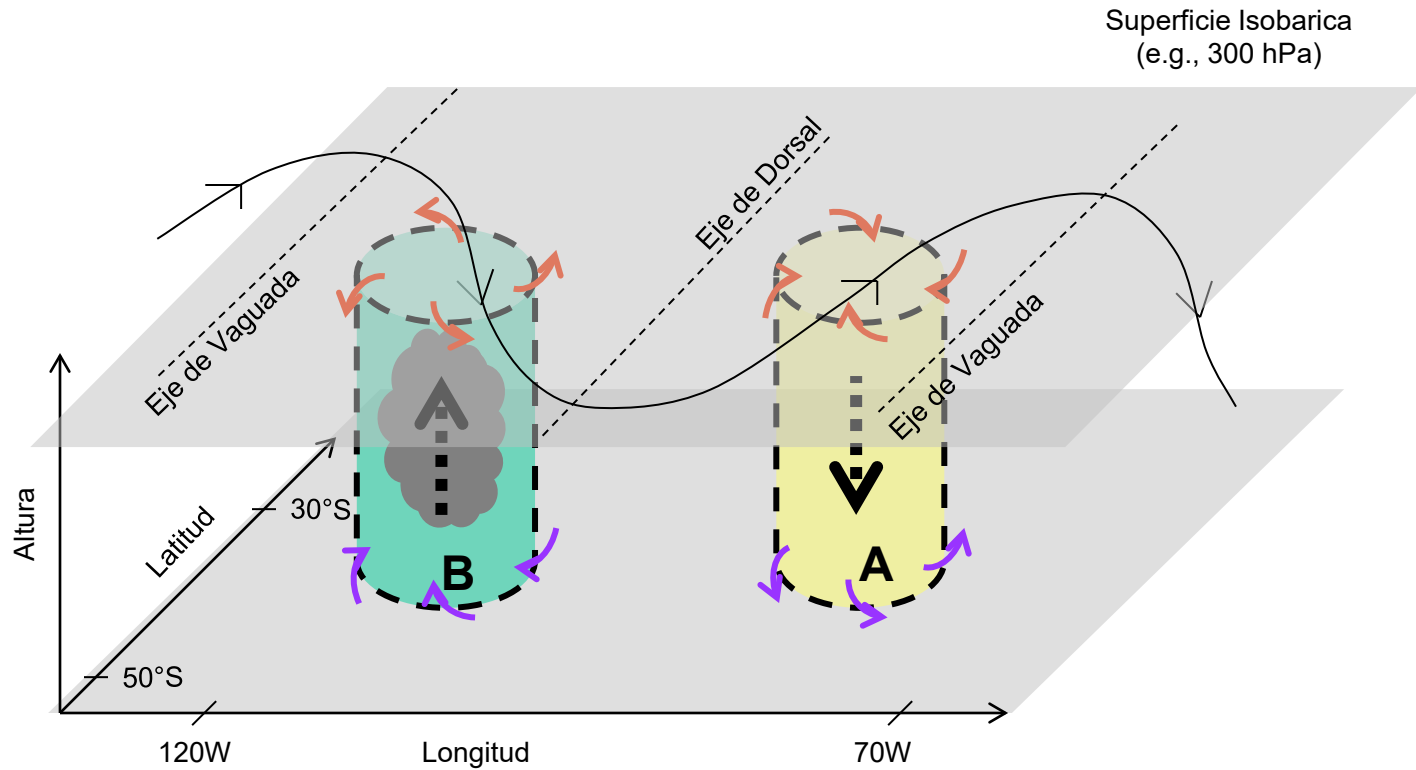




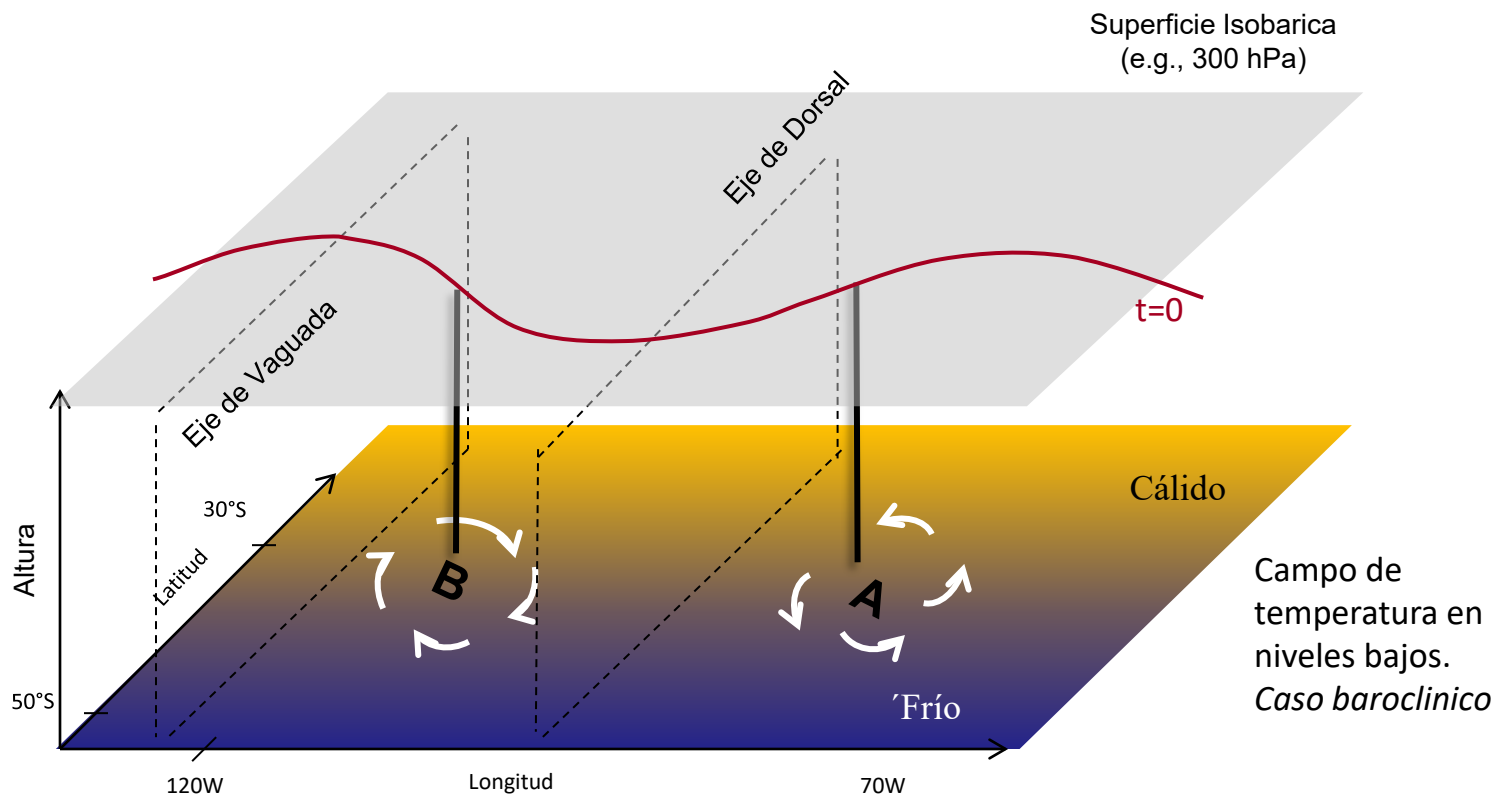


Estructura tri-dimensional de la onda en Desarrollo

El roce (especialmente en sfc) tiende a aplanar todo...

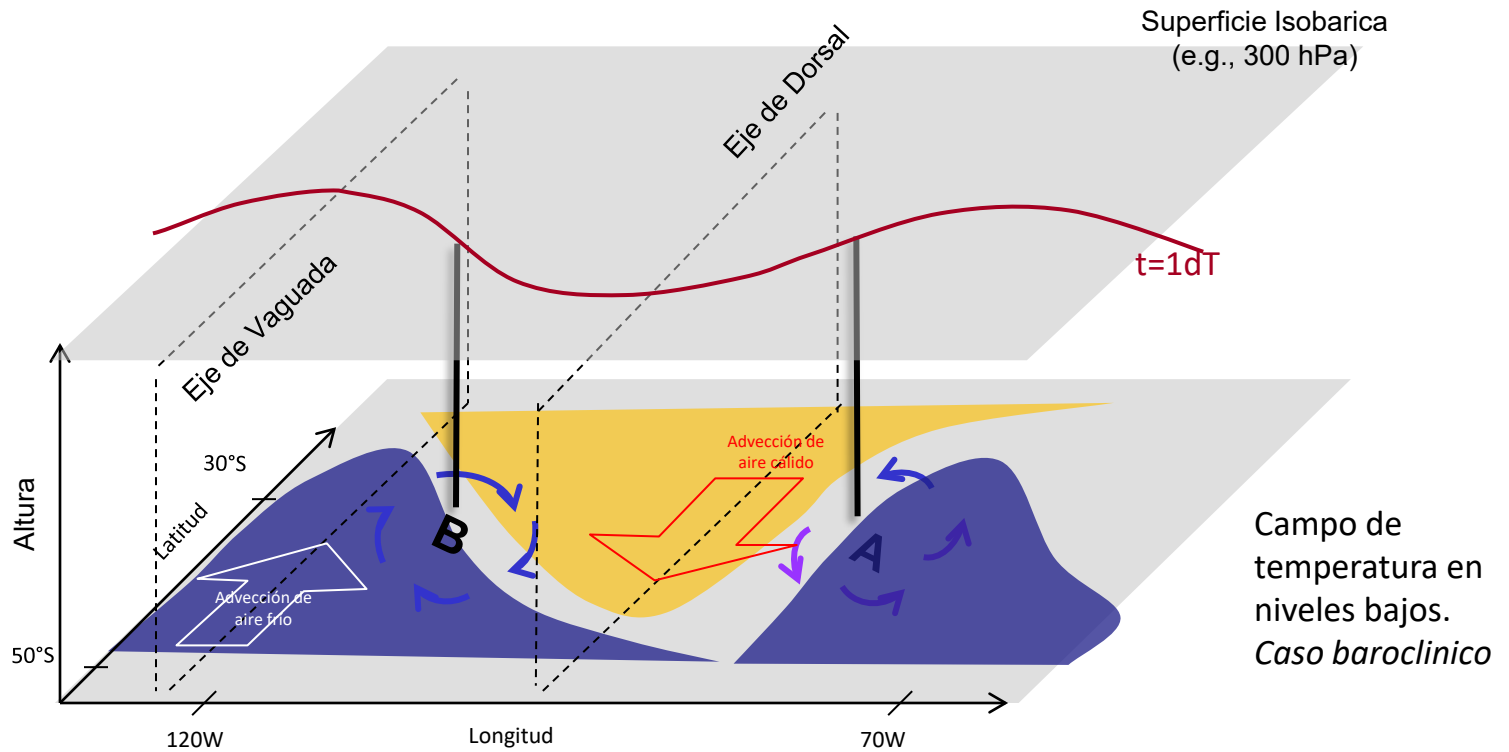


Estructura tri-dimensional de la onda en desarrollo



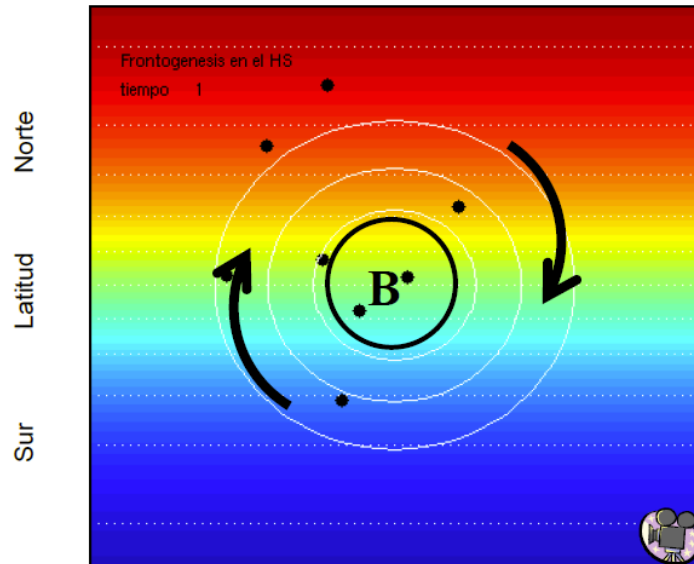
Estructura tri-dimensional de la onda en Desarrollo

En este caso la advección fría bajo la VV hacen caer Z300

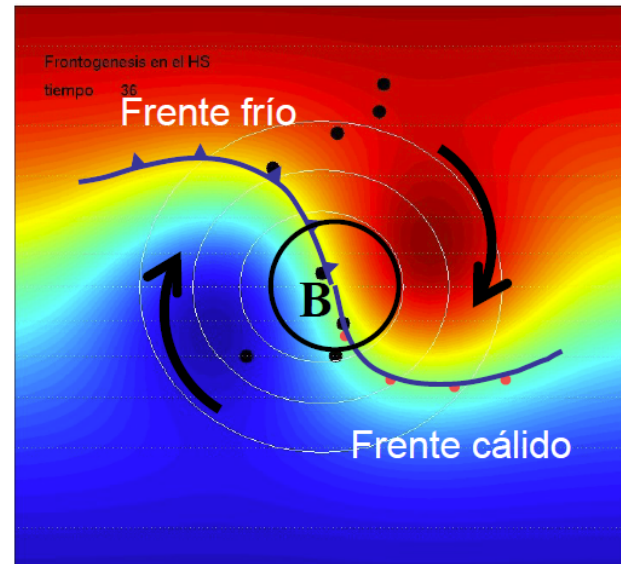


Frontogenesis en el Hemisferio Sur

Aire cálido



Aire frío



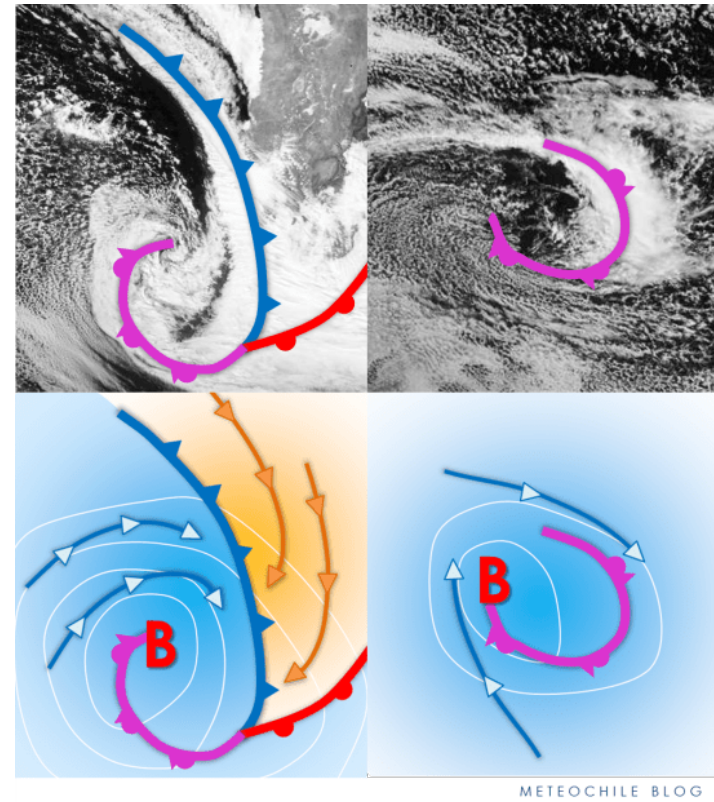
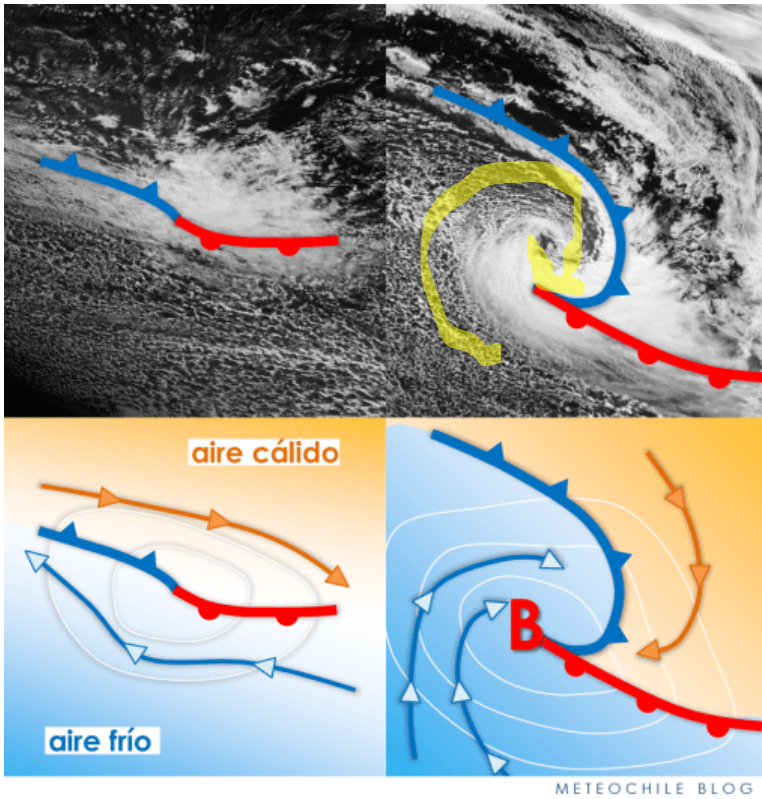
Oeste

Longitud

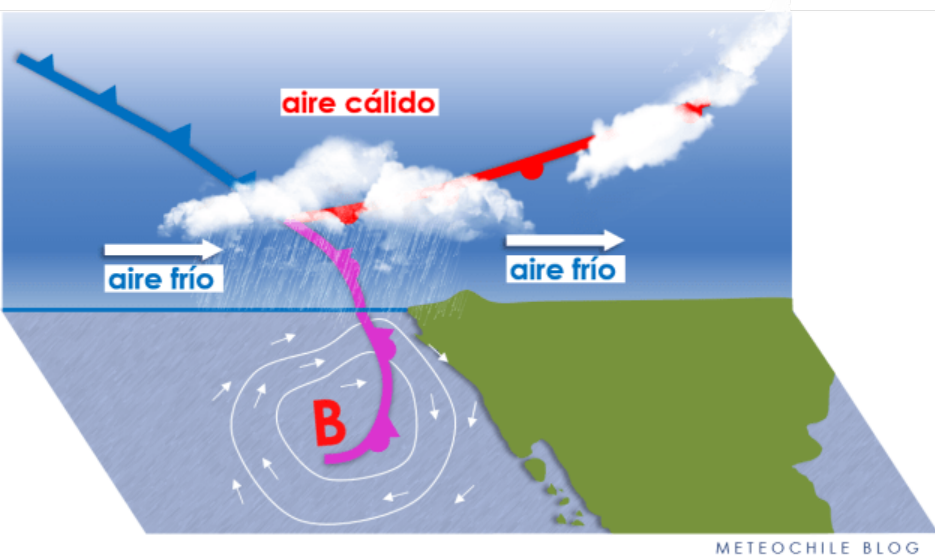
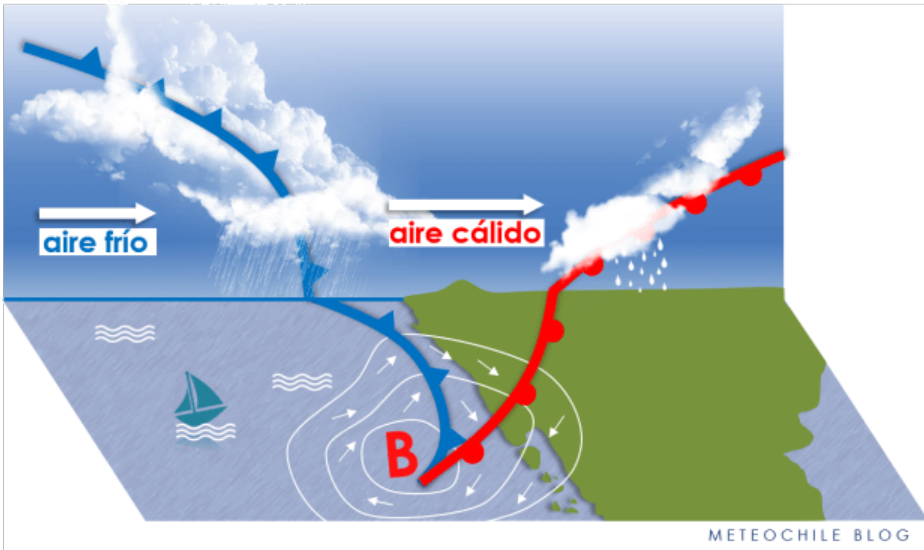
Este

Colores: Temperatura en niveles bajos
Contornos: Presión superficial
Puntos: Trazadores de velocidad

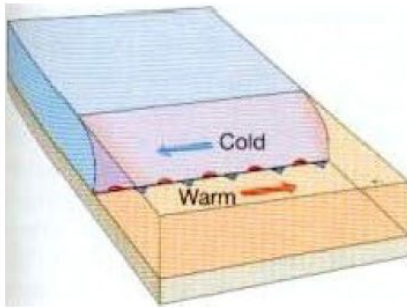
<https://blog.meteochile.gob.cl/2018/07/12/radiografia-de-un-sistema-frontal/>



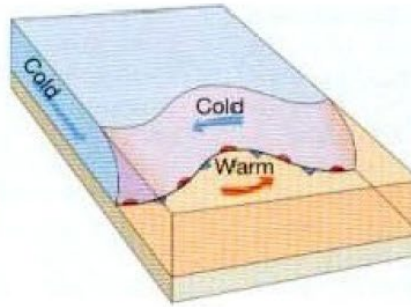
<https://blog.meteochile.gob.cl/2018/07/12/radiografia-de-un-sistema-frontal/>



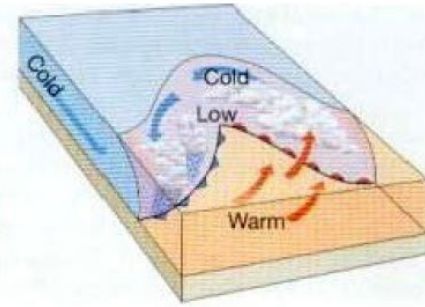
Desarrollo de una depresión (ciclón) en el Hemisferio Norte



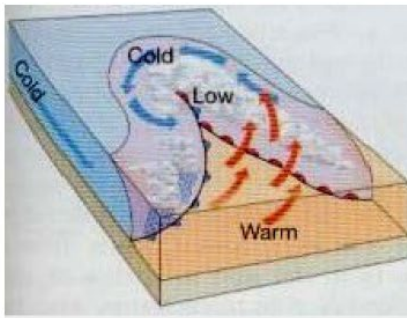
a) Se forma el frente



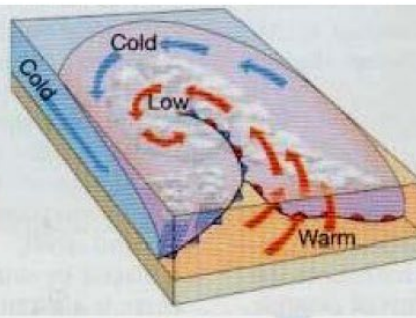
b) Se desarrolla la onda



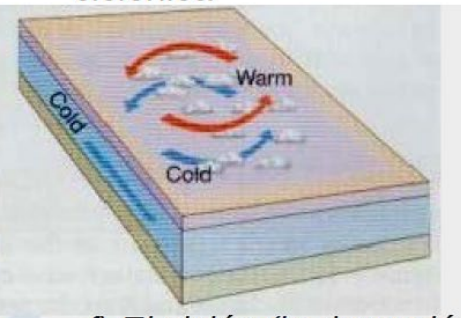
c) Se establece una
circulación
ciclónica



d) Comienza la oclusión

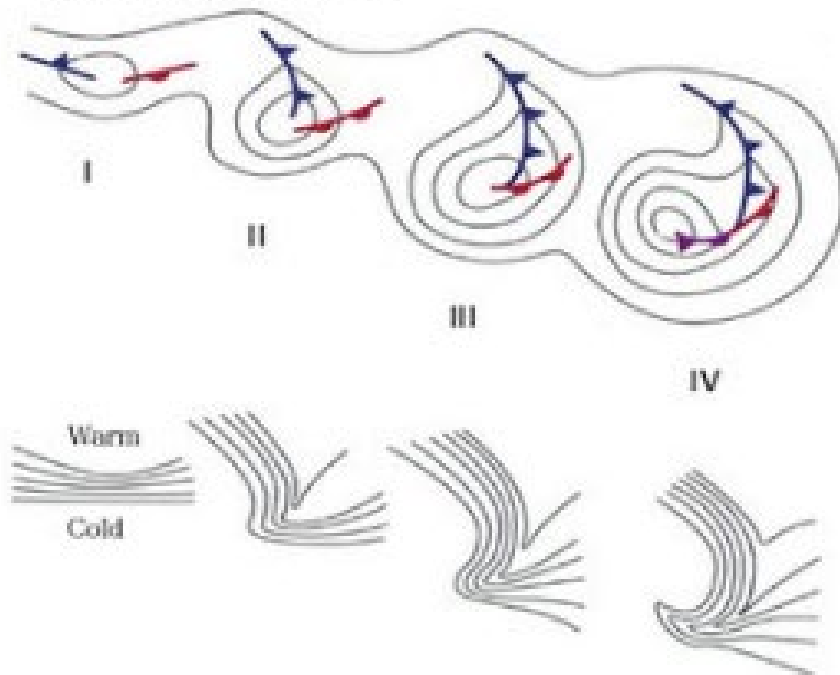


e) Se desarrolla el frente
ocluido

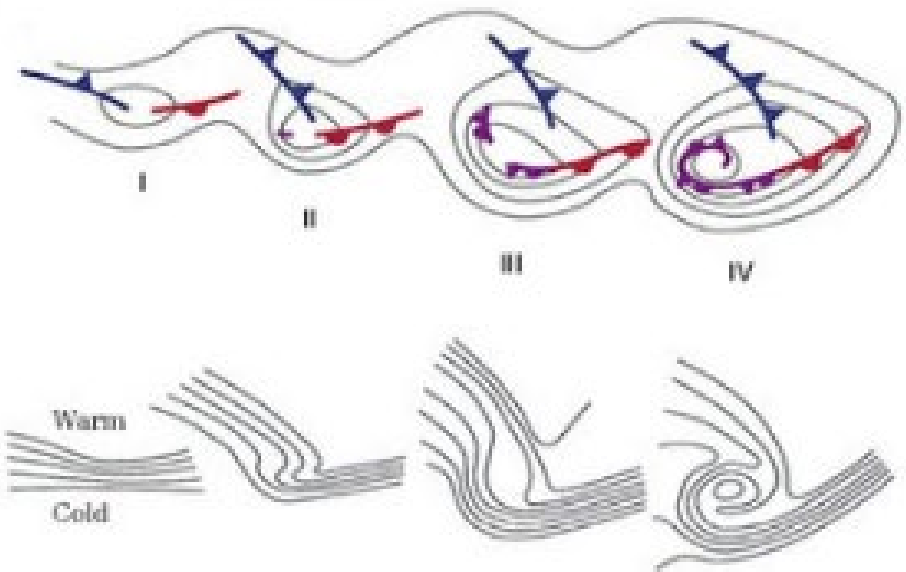


f) El ciclón (la depresión)
se disipa

(a) Norwegian model



(b) Shapiro-Keyser model



This figure was uploaded by [Carolina Barnez Gramscianinov](#).

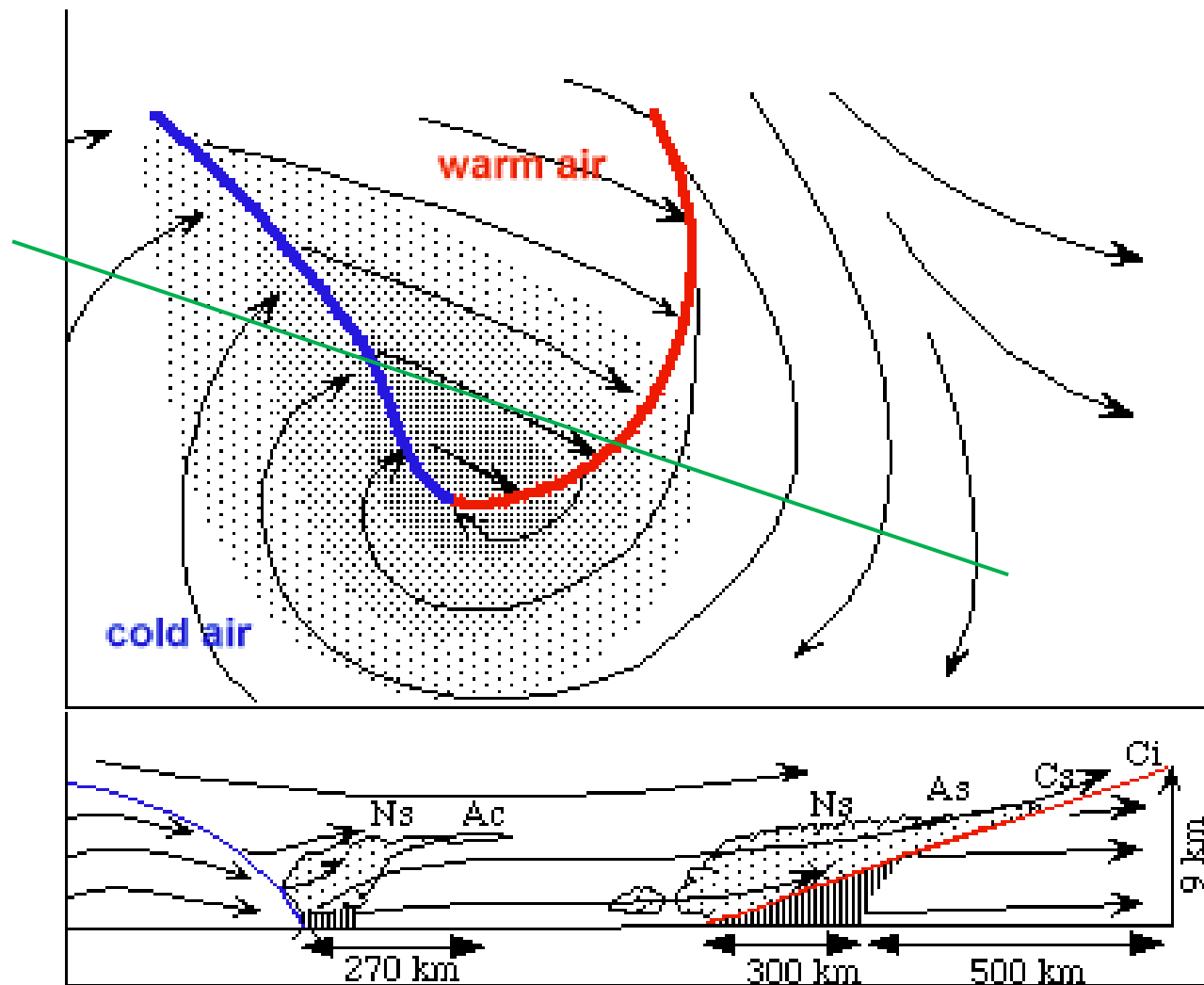
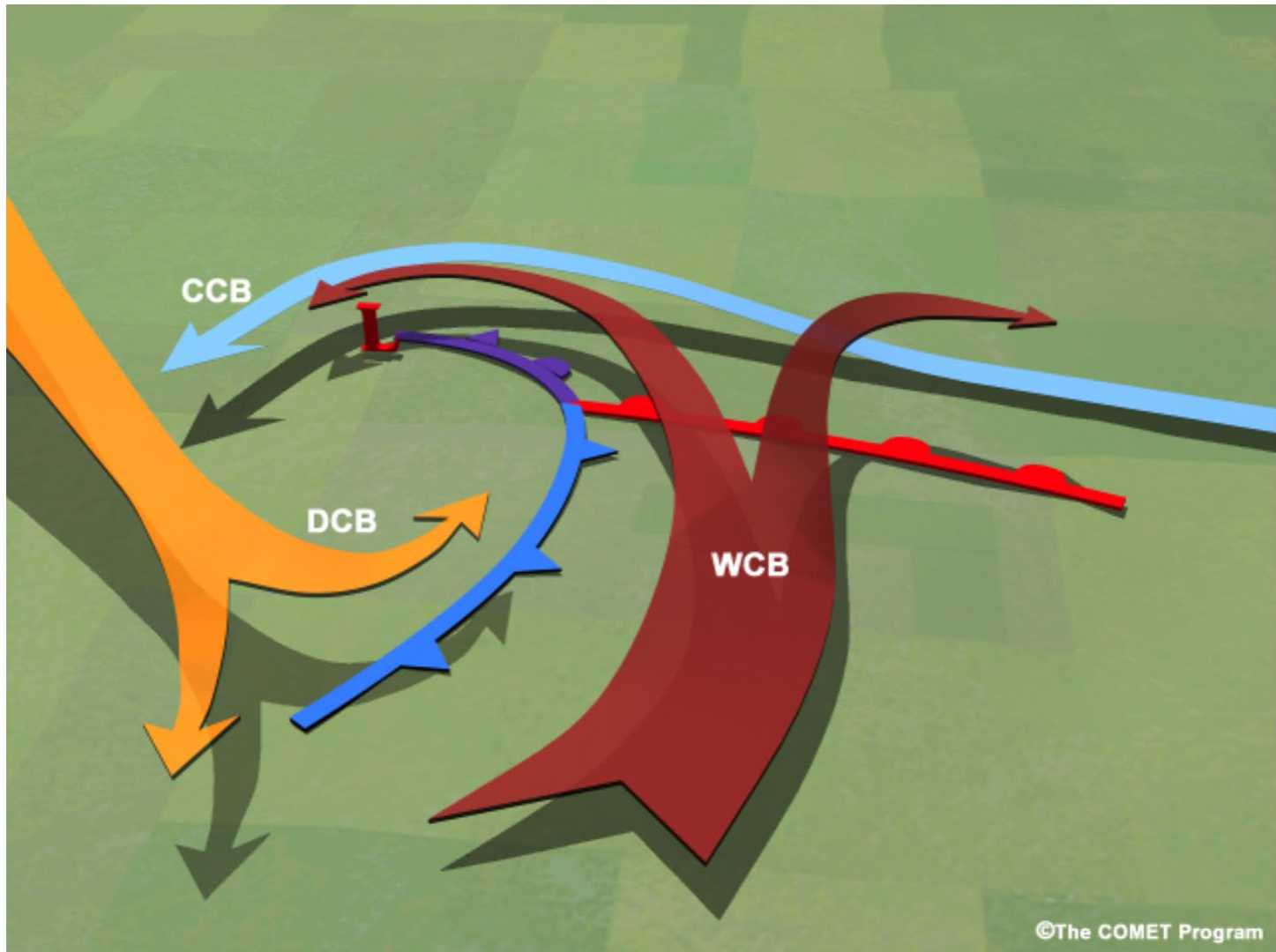
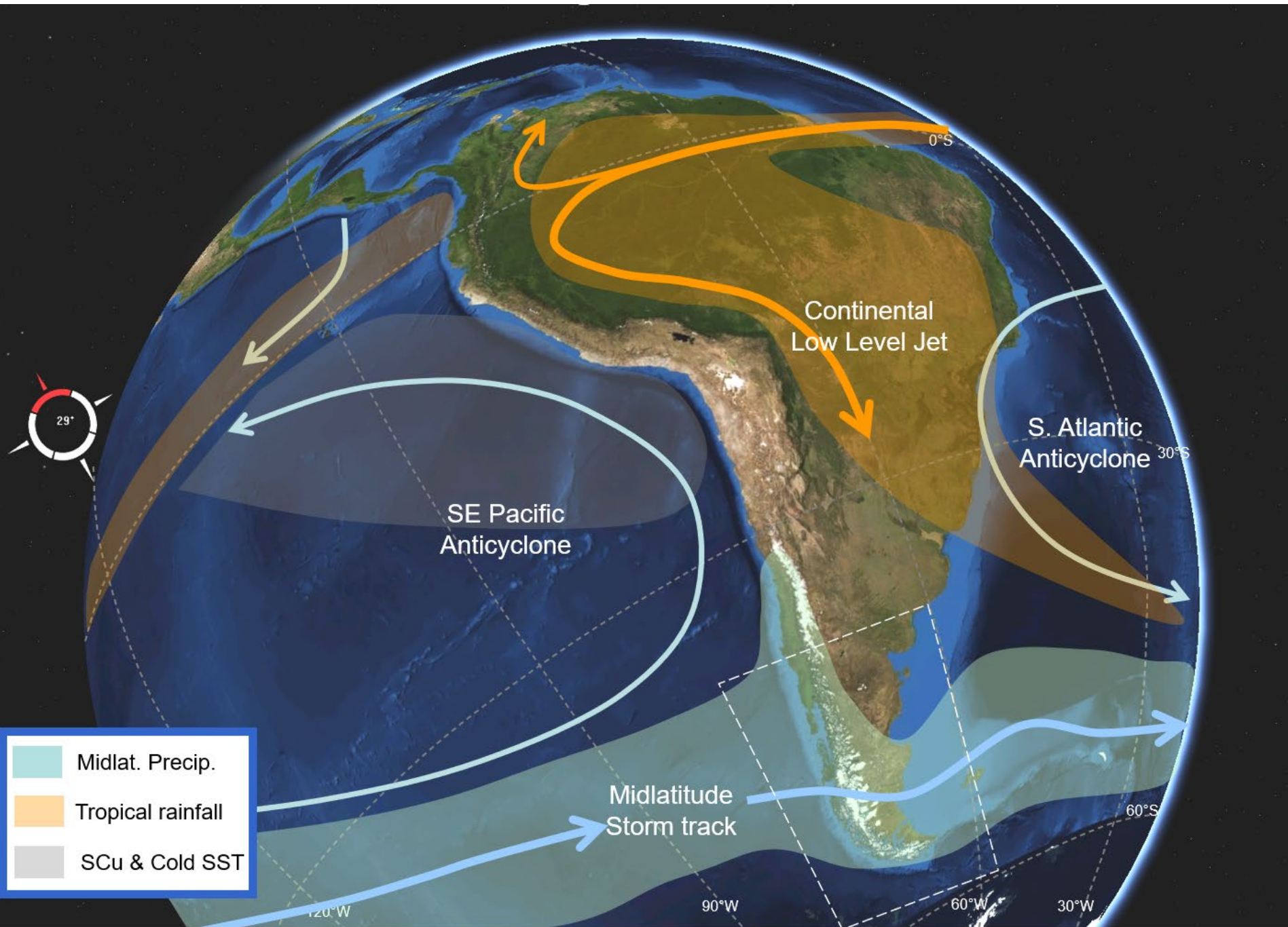


FIG.1 Formation of a cold front in the southern hemisphere. Below is a cross-section through a cold (blue) and warm (red) front - clouds are Ns (nimbostratus), Ac (altocumulus), As (altostratus), Cs (Cirrostratus), Ci (Cirrus).

There are three types of conveyor belts as defined by [Carlson](#) (1980):

- Warm conveyor belt (WCB; relatively high θ_w)
- Cold conveyor belt (CCB; relatively lower θ_w) and
- Dry conveyor belt (DCB; originally called the dry stream; lowest θ_w values).





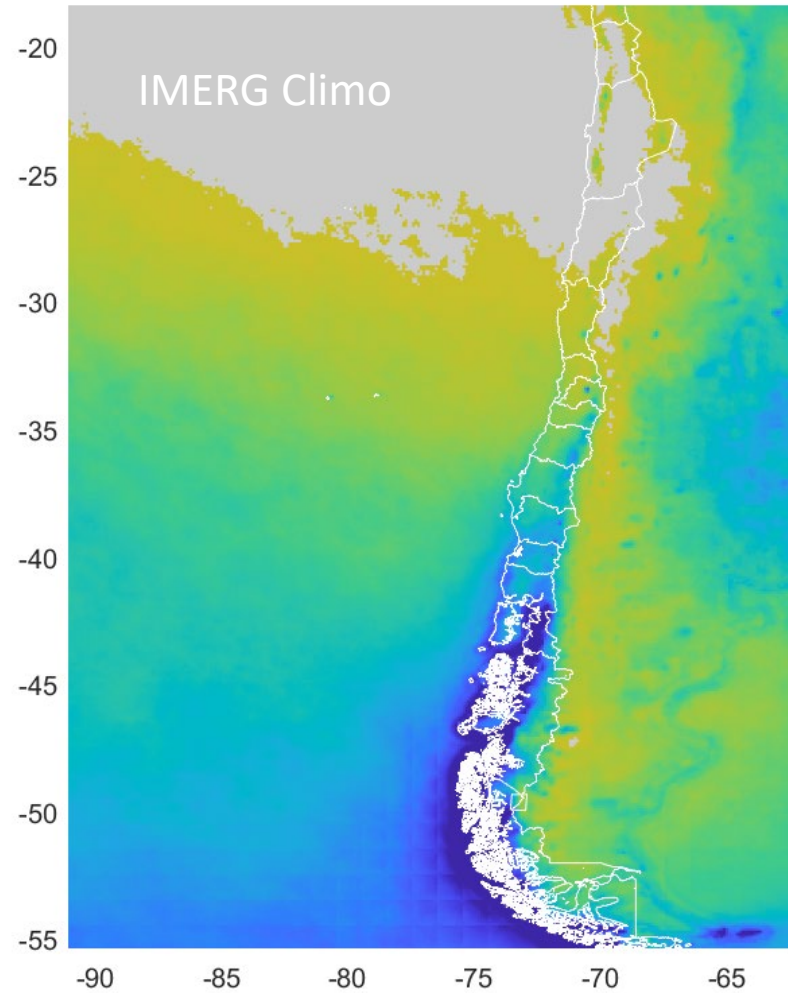
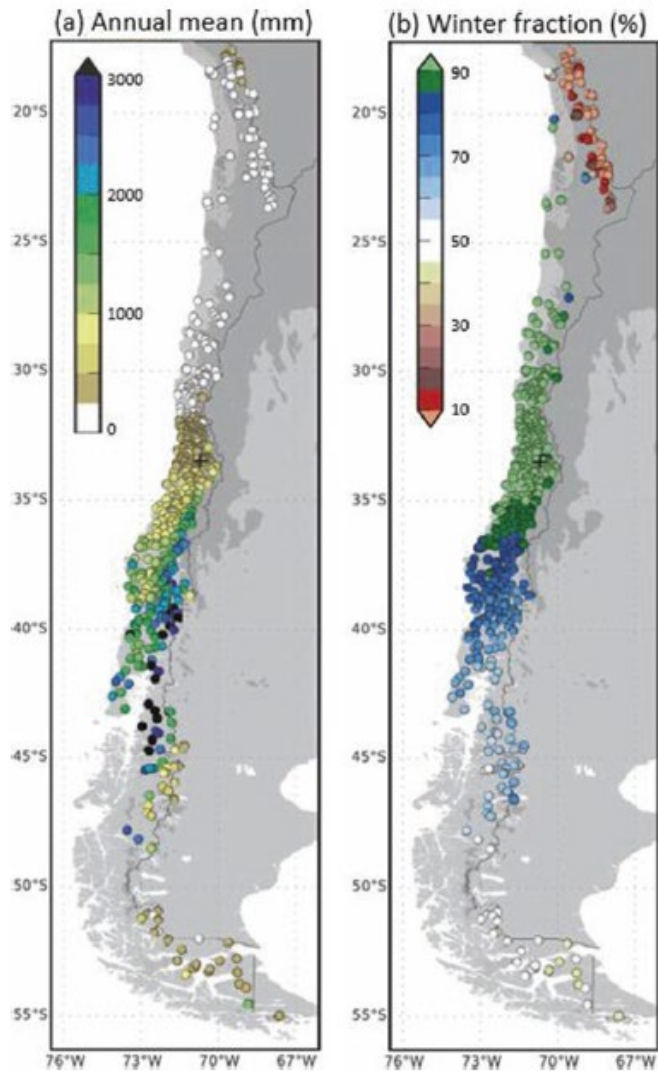
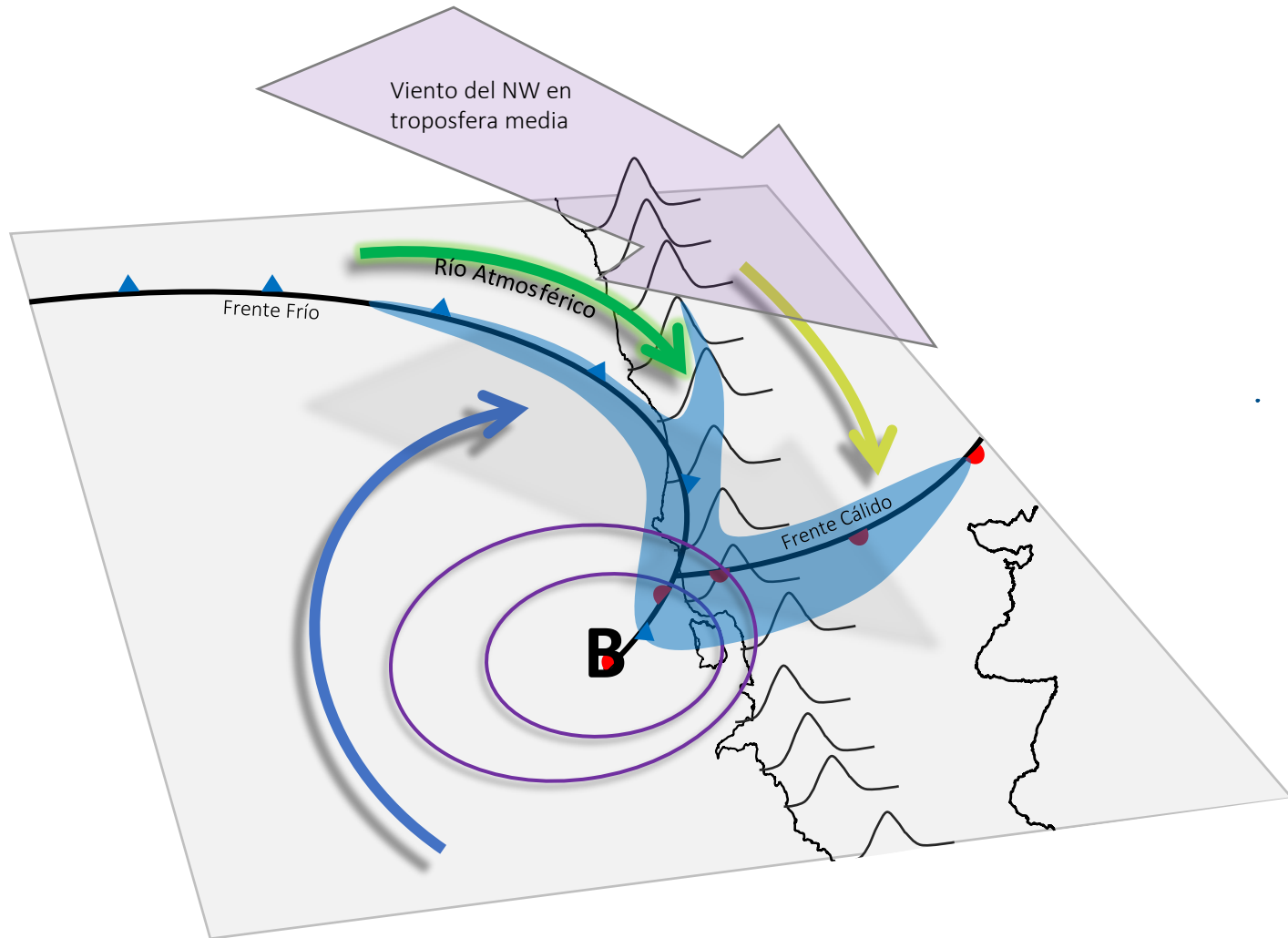
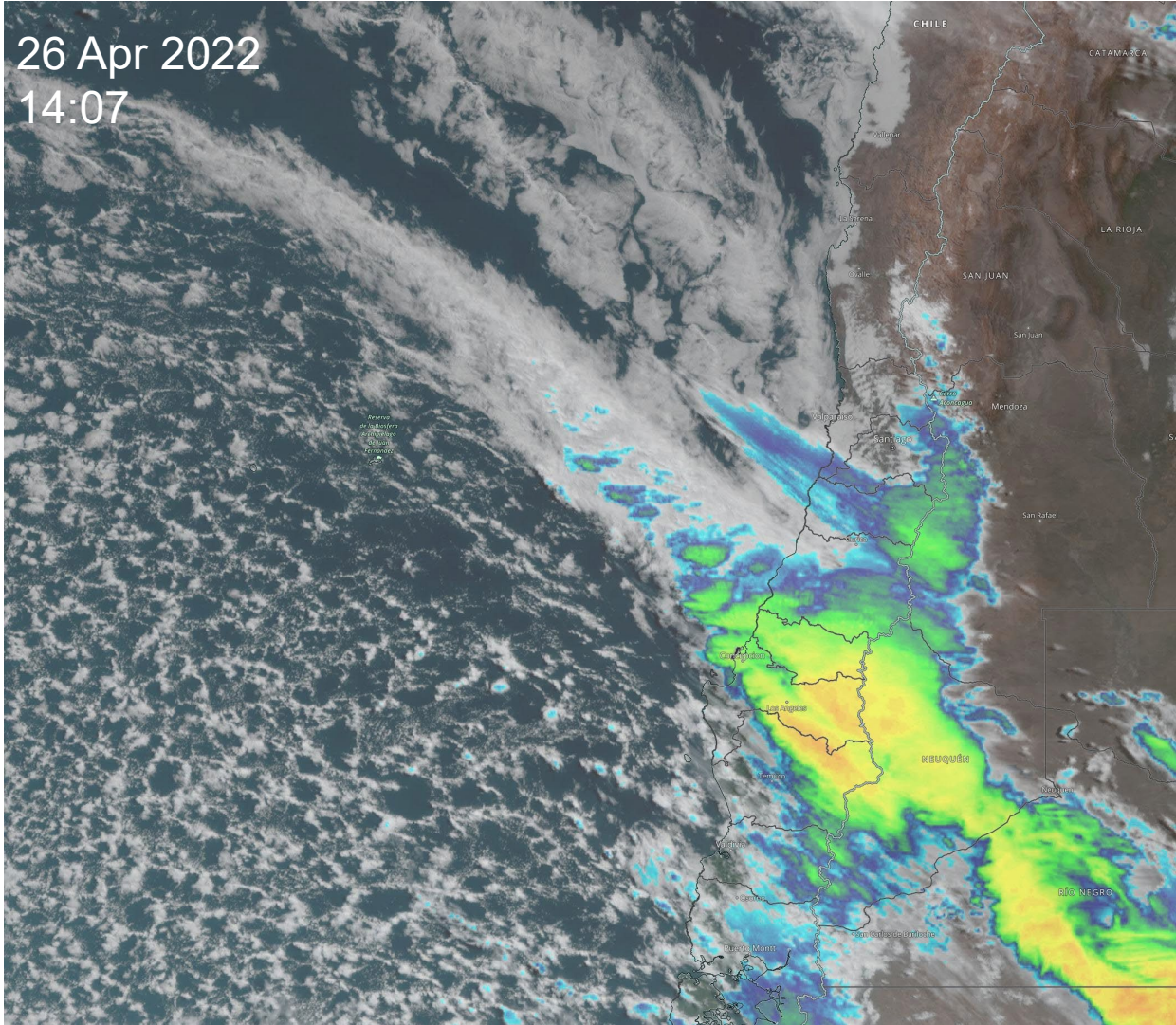
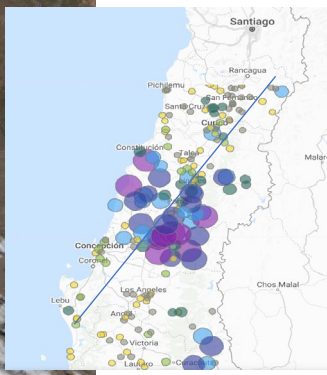
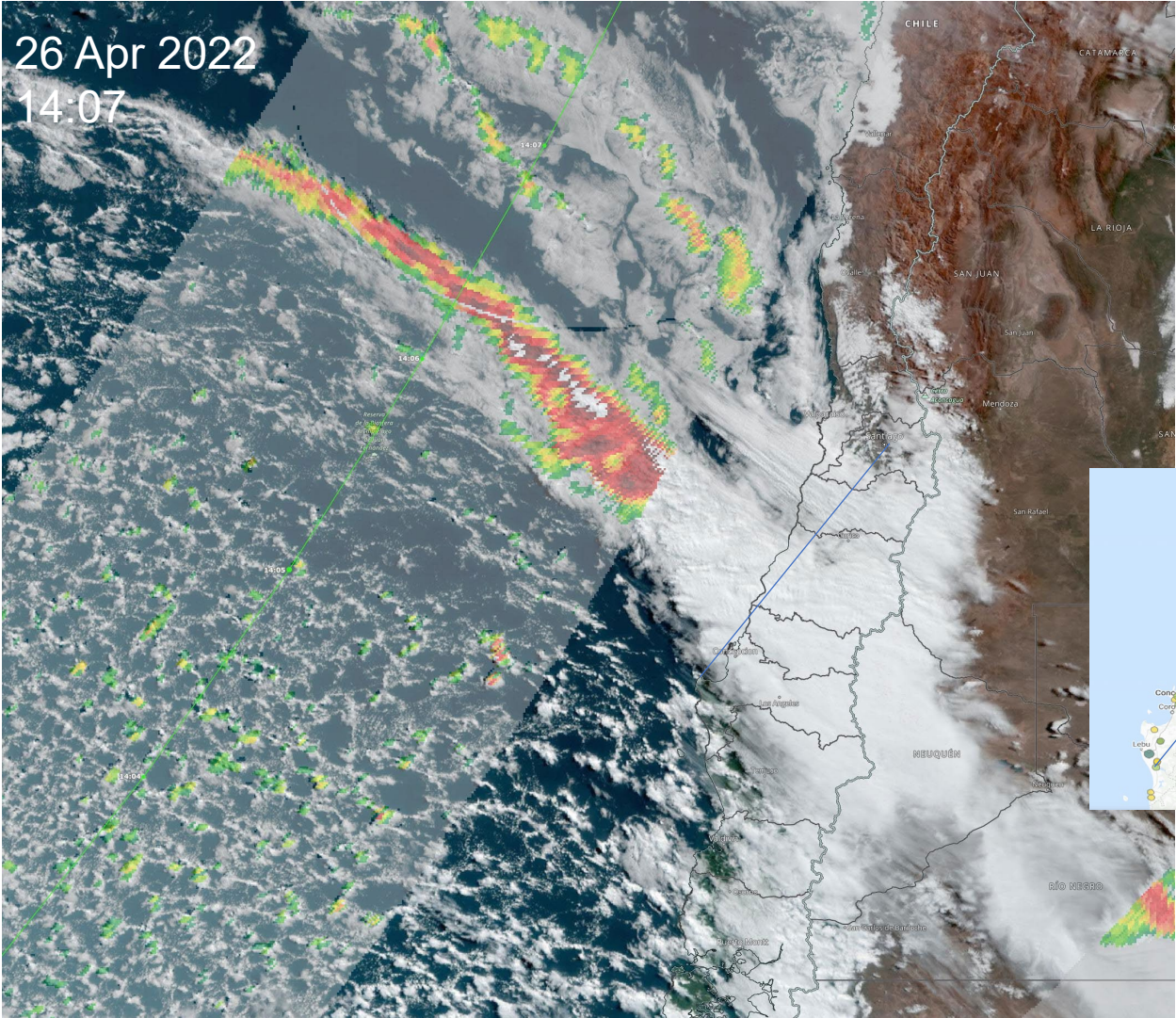


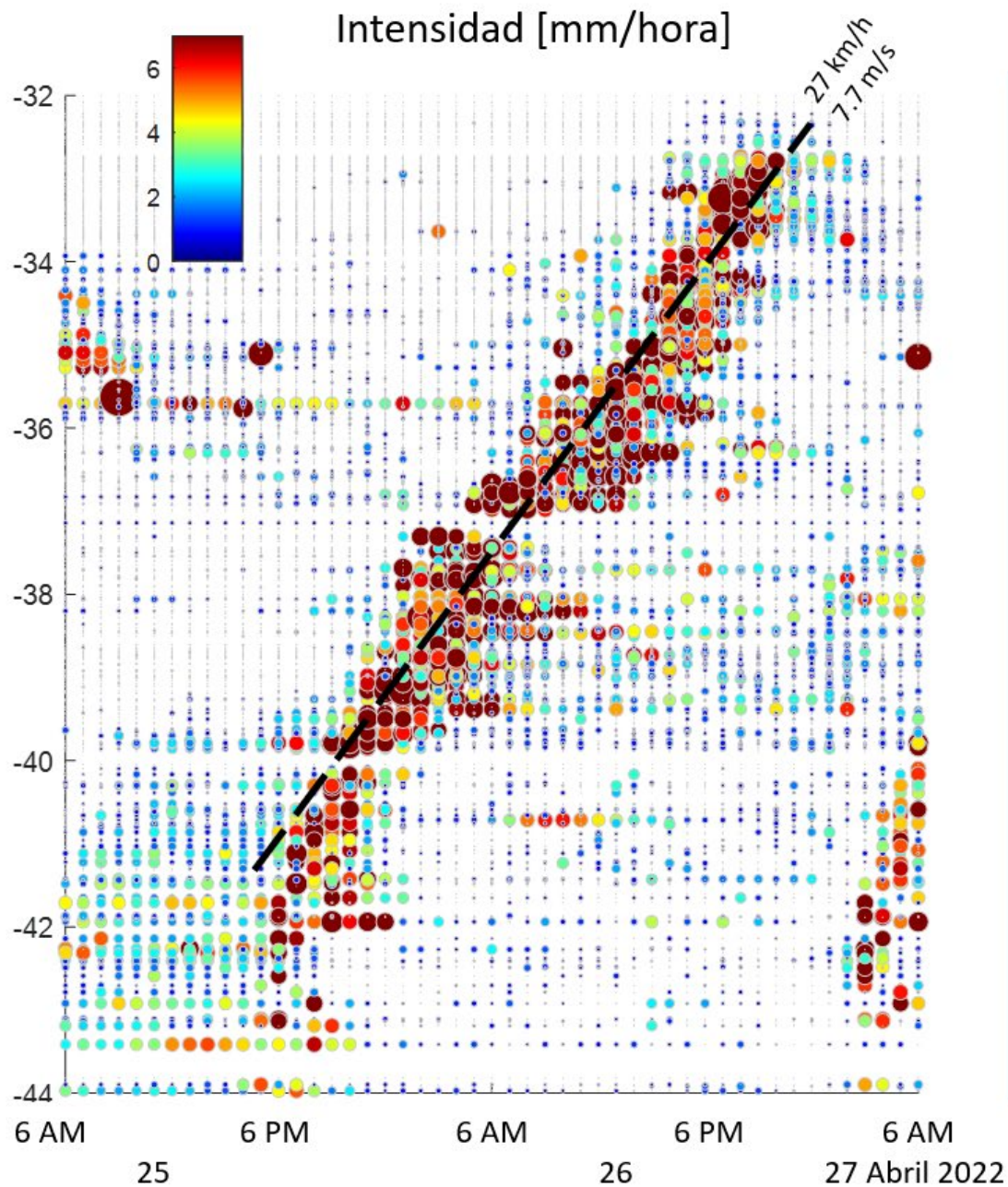
Fig. 2.2 Where and when does it rain along Chile? (a) Mean annual precipitation (mm) in local observational sites. (b) The contribution (%) of rainfall during the austral winter semester (April–September) to annual totals in each site. (Data source: National Weather Service (DMC) and National Water Agency (DGA). Adapted from Boisier et al. 2018)

Sistema frontal



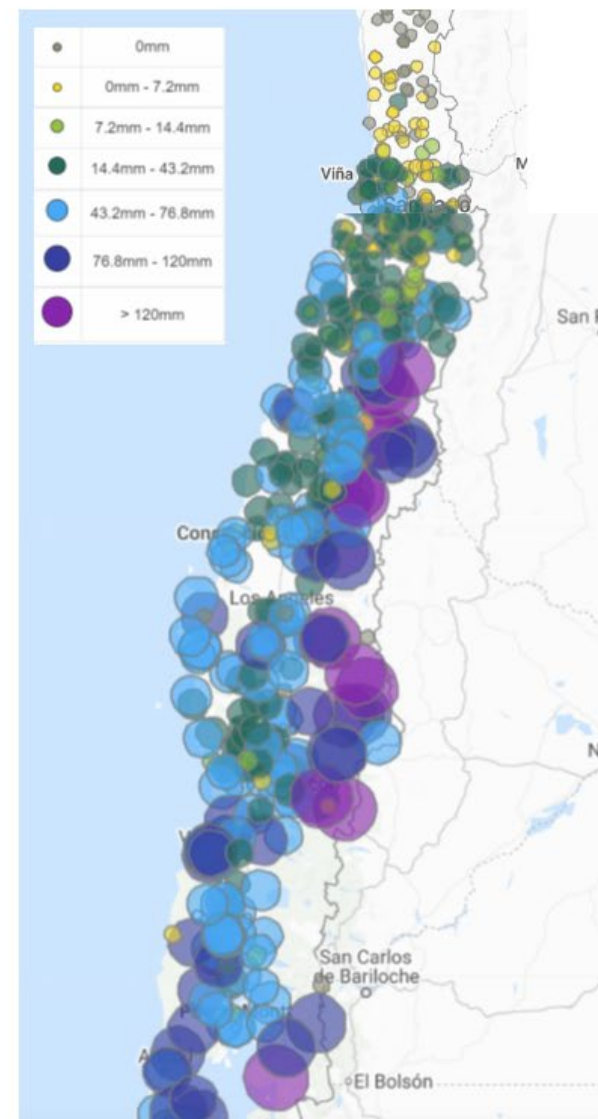






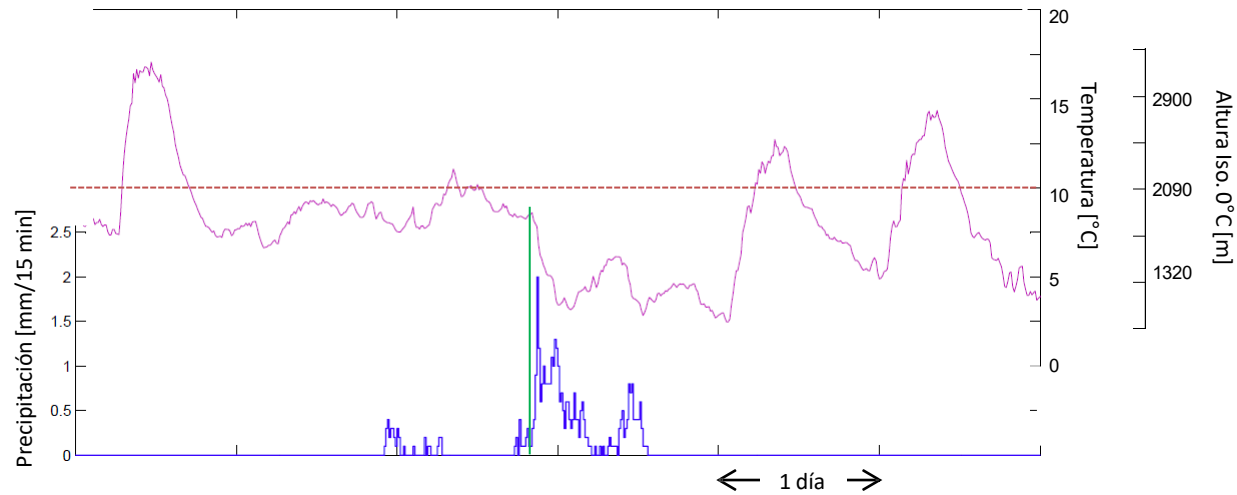
Acumulada [mm] en 48 hrs

05 AM 25 Abr-05 AM 27 Abr 2022



Eventos de precipitación también difieren en su temperatura

Tormenta fría



(d) Frente estacionario y
río atmosférico zonal

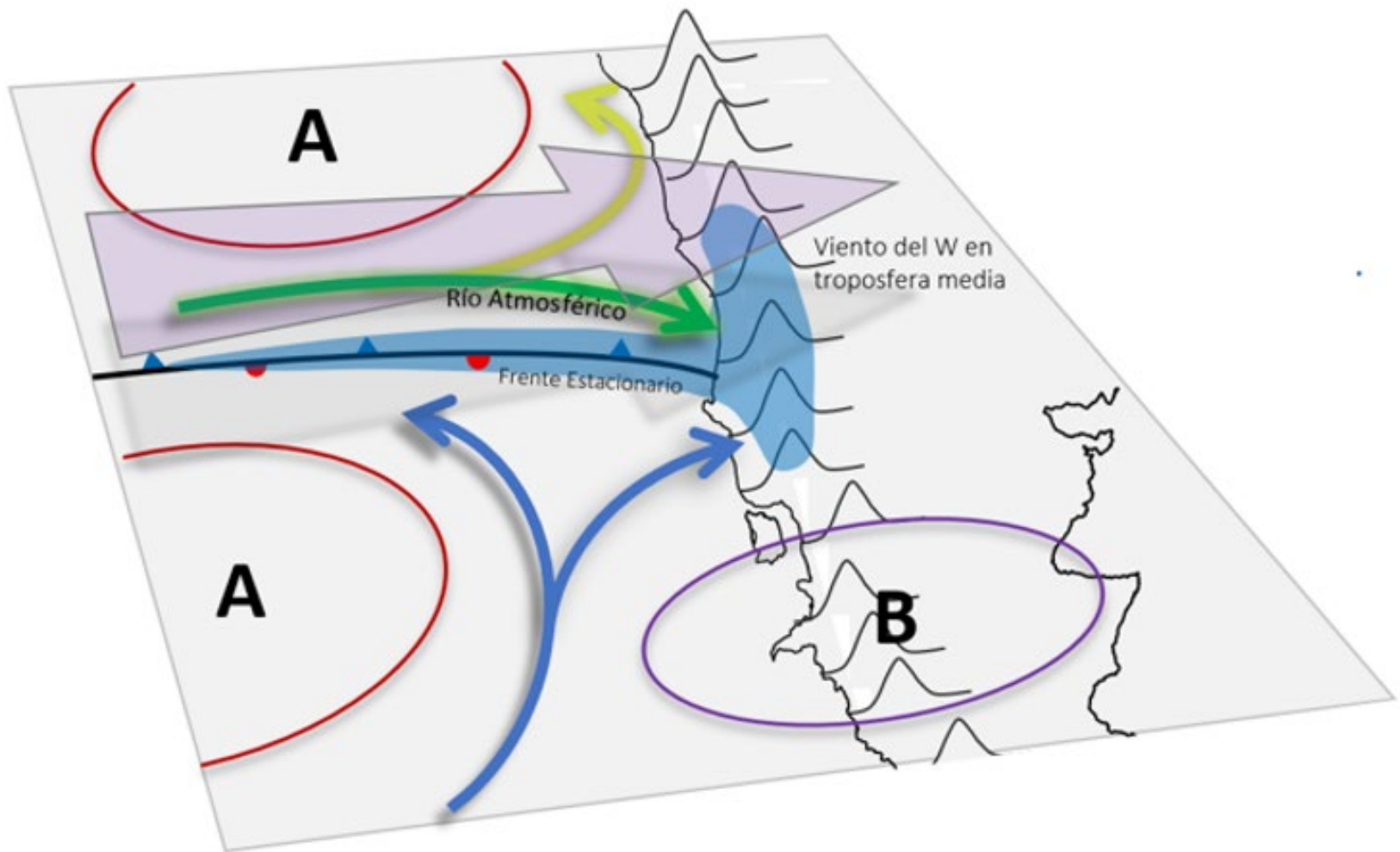
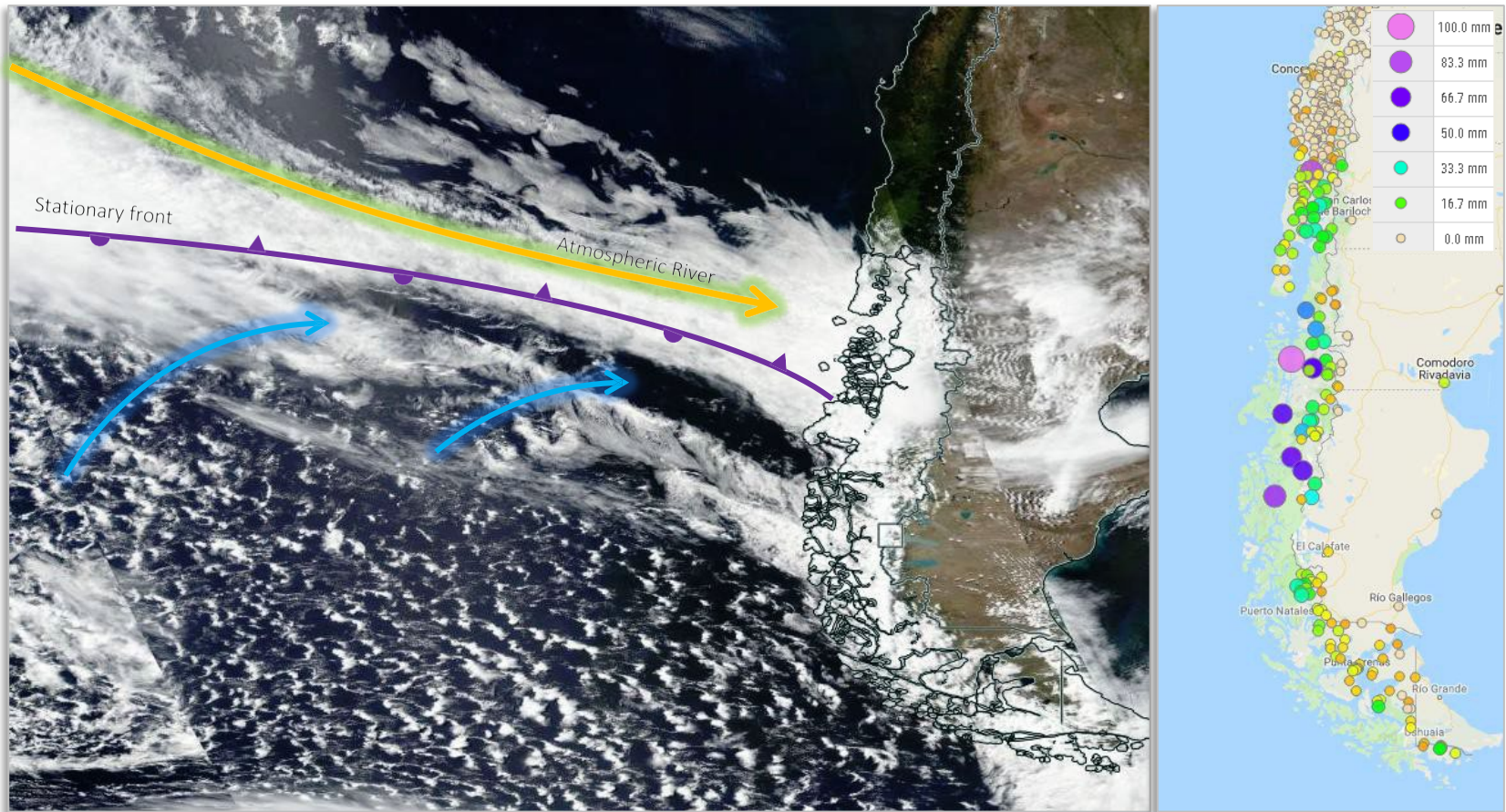
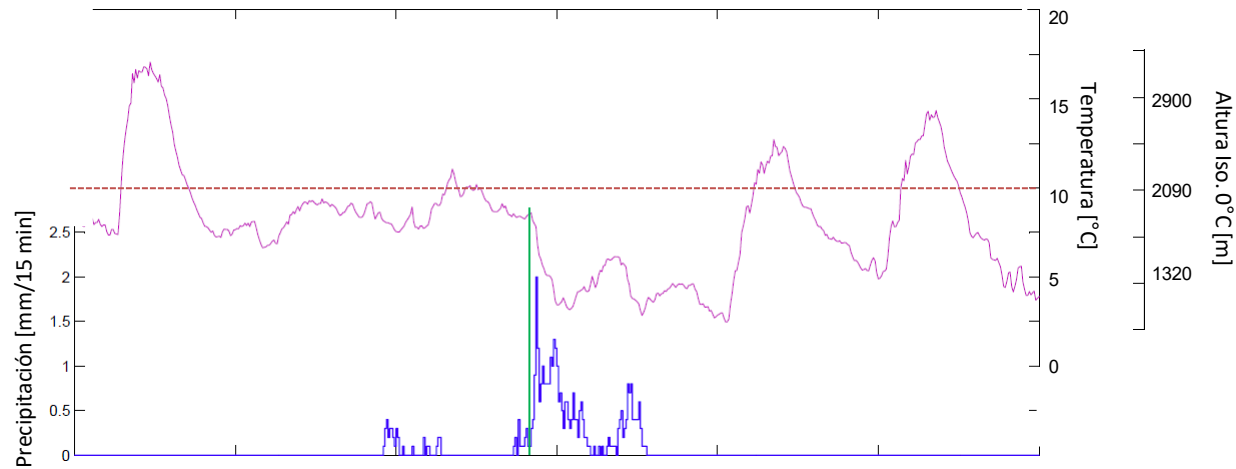


Figure 6:
Atmos River (16-Dic-2017....Santa Lucia)



Eventos de precipitación también difieren en su temperatura

Tormenta fría

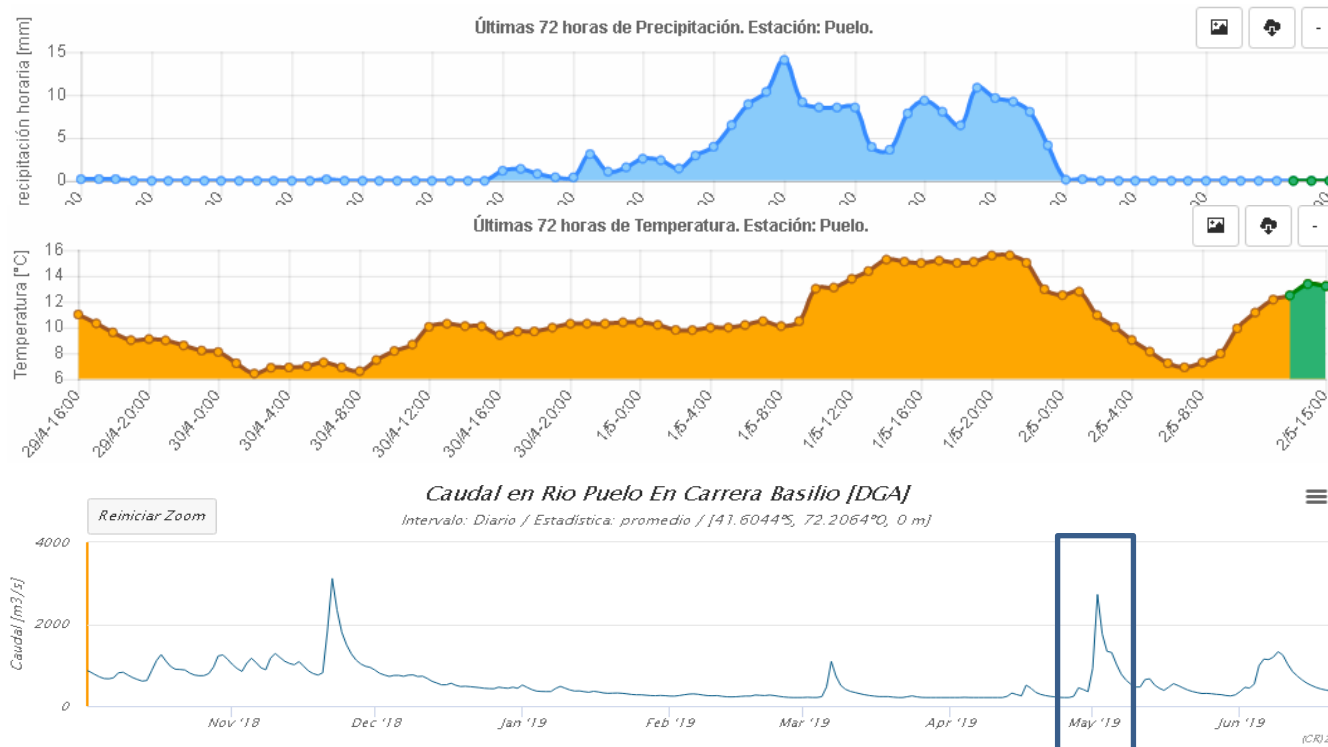


Tormenta Cálida



¿Es diferente el ambiente sinóptico entre TF y TC?
¿Cuan hábiles son los MPN en predecir Temp-Tormenta?

Río Atmosférico Zonal / Tormenta Calida ☹️



Alerta roja en Puerto Montt: Desborde de río, dos muertos y clases suspendidas por temporal

La Onemi también informa además que hay 81 personas damnificadas en la Región de Los Lagos producto de las precipitaciones.

por ENRIQUE FUENZALDA

