

GFS/CFRSR 1-day Avg
1979-2000 base



2m T Anomaly (°C)
Sunday, Feb 03, 2019

ANID/FONDECYT/11170486 – ANID/PAI/79160105

ANID/FONDAP/15110009

Heat waves in South-Central Chile: some impacts

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Thanks to: Belén de la Torre, Pedro Valdebenito, Sebastián Vásquez, Diego Narváez, Javiera Ramírez,

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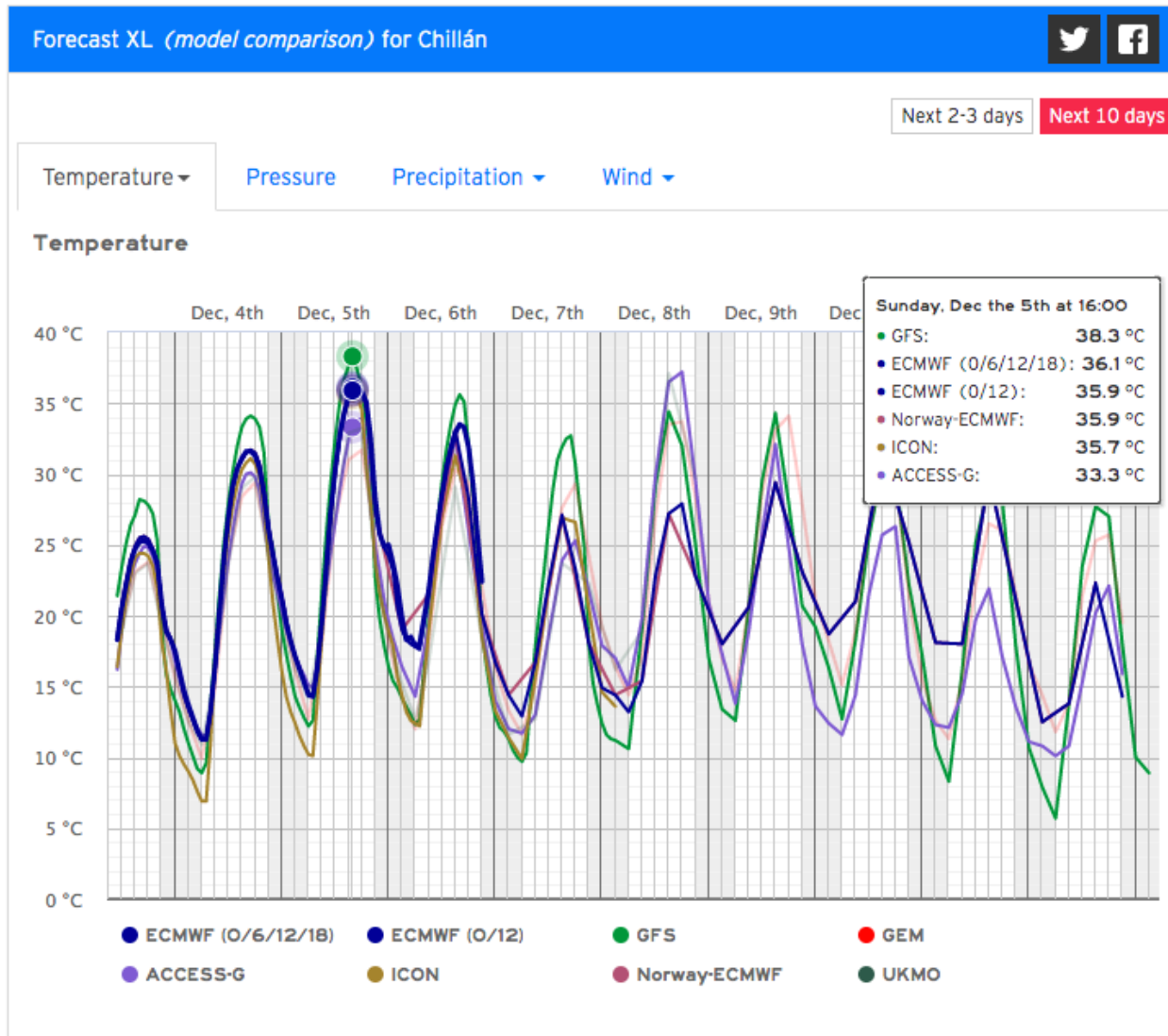
Workshop CMM Copernicus Chile / 03.12.2021

ClimateReanalyzer.org
University of Maine

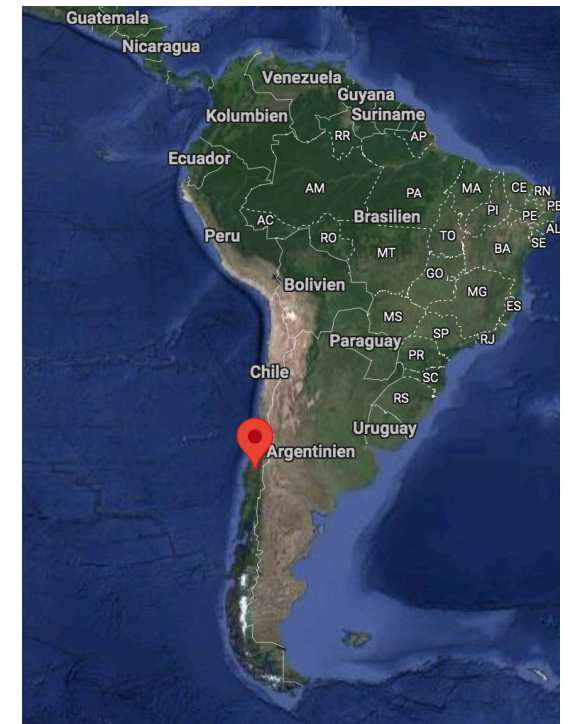
*summer (**Dec-Feb**) is arriving
to South-Central Chile (**SCC**):
it's **HIGH SEASON** for heat waves!*



Sunday 05.12, Chillán: quite high temperature!

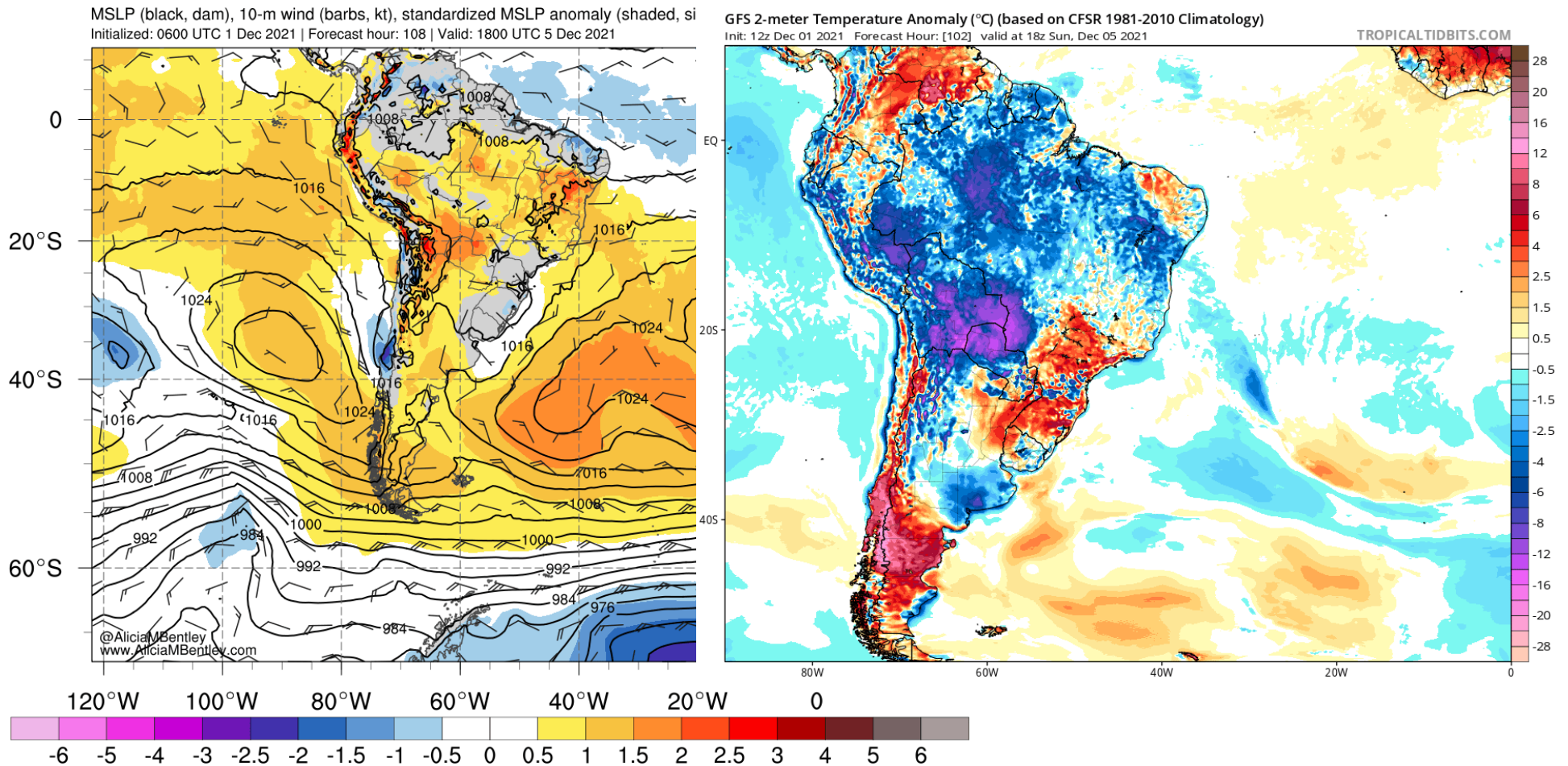


All times in forecast are in local time (GMT-03)



meteologix.com/cl

December 5, 2021: *heat wave!*



GFS
atmos.albany.edu
tropicaltidbits.com

heat waves and their impacts: *wildfires!*

January 24-27, 2017

ERA5 reanalysis

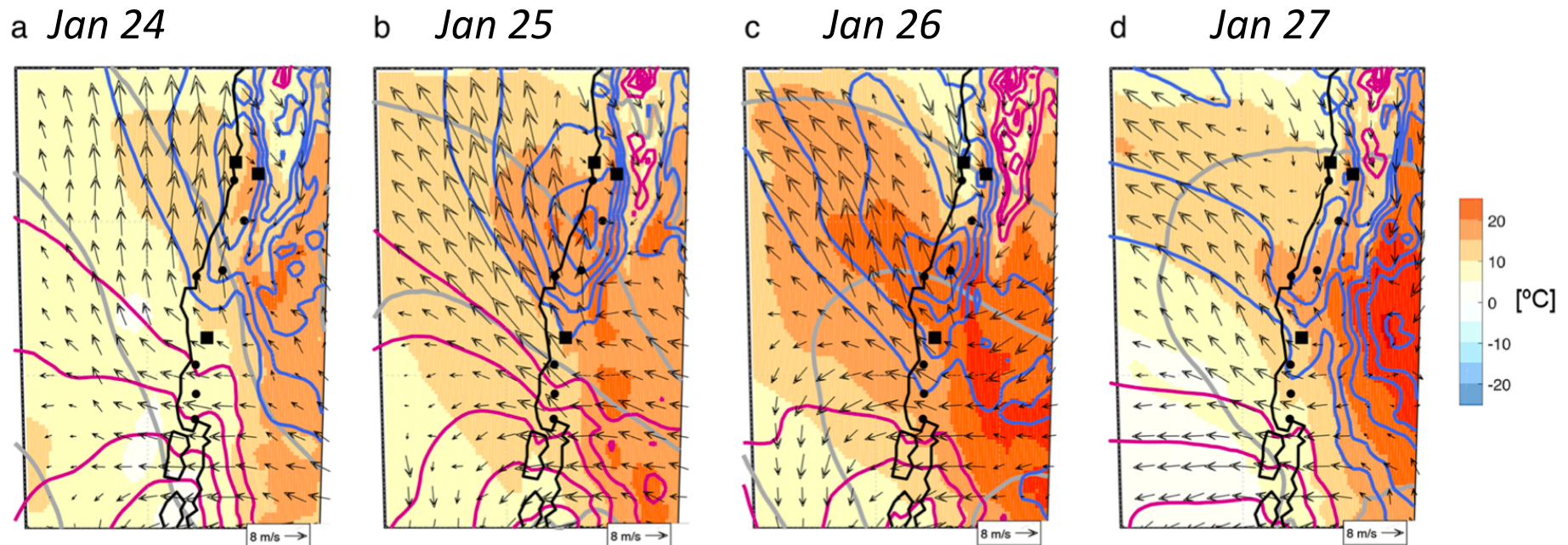
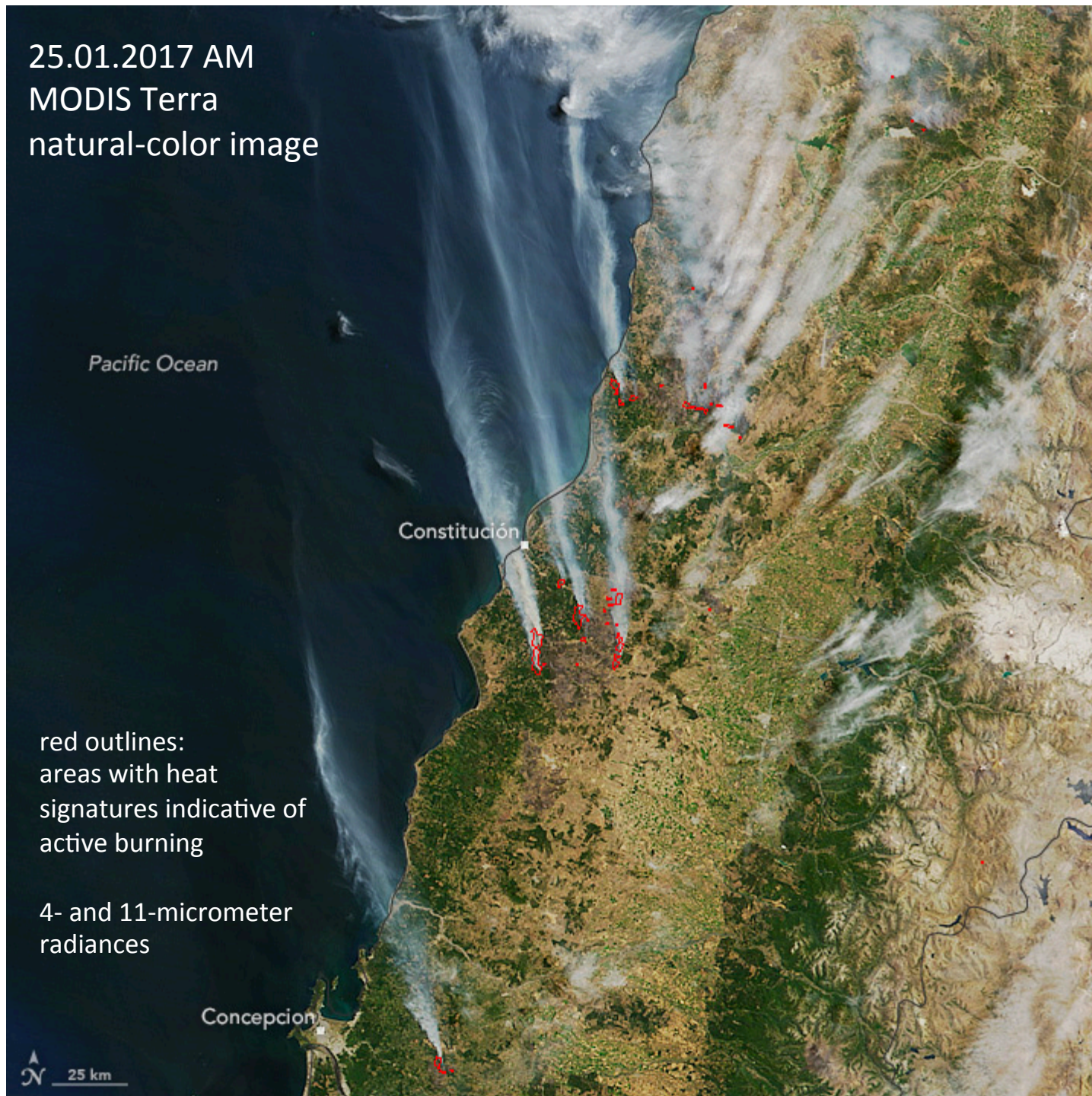


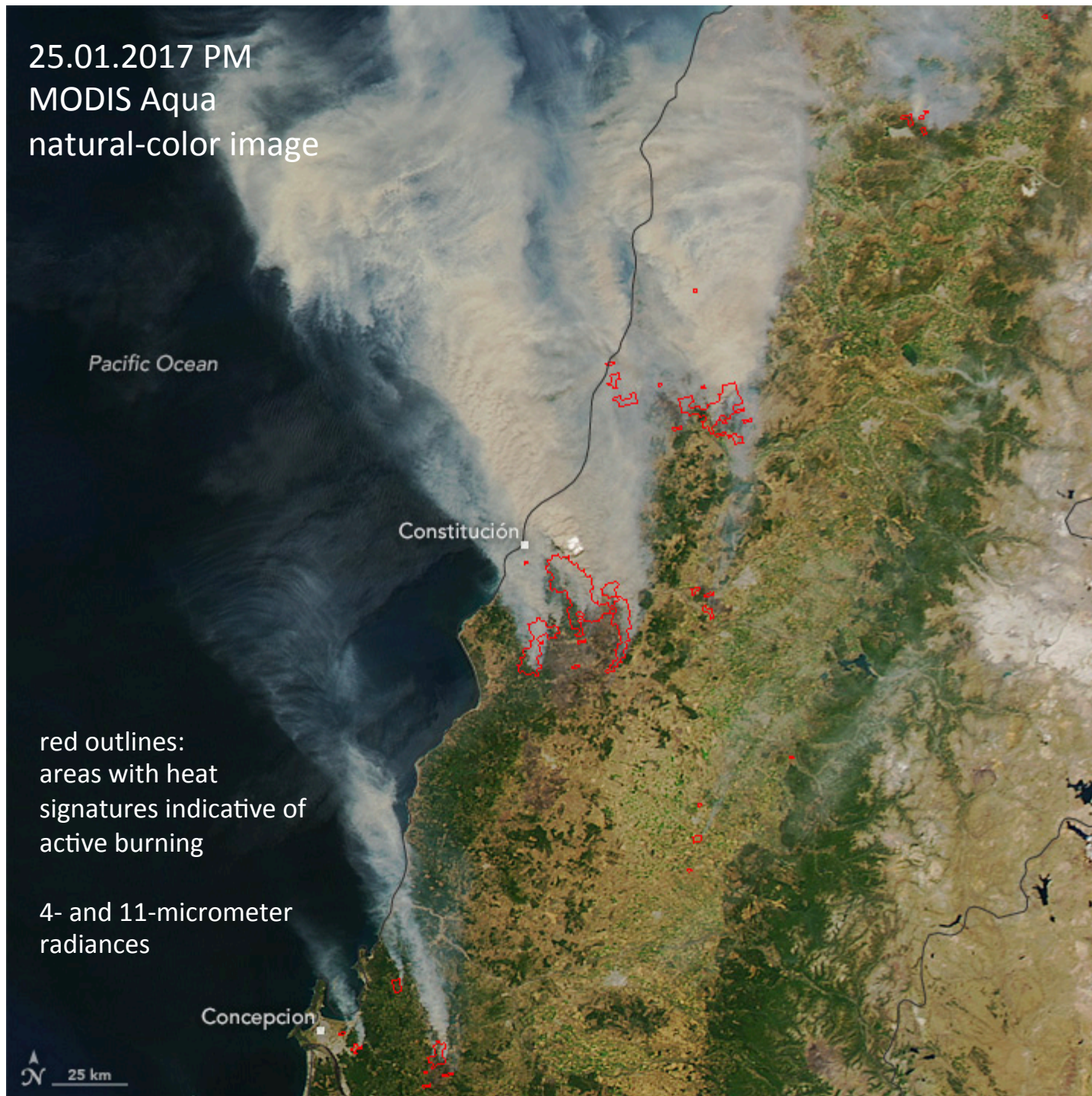
Fig. 12 **a** Synoptic configuration for central Chile at 18:00 local time (00Z) for 24 January 2017, **b** 25 January 2017, **c** 26 January 2017, and **d** 27 January 2017, shown as anomalies with respect to the November to March 00Z climatology for 1981–2018 period. Each panel depicts air temperature at 925 hPa (shaded, see color scale), u and v-components of wind at 925 hPa (vectors), sea level pressure

(dark red/blue contours for positive/negative anomalies every 2 hPa), and geopotential height at 500 hPa (grey contours for positive anomalies every 50 gpm). Black circles depict the locations of weather stations used in this study; bigger black squares correspond, from North to South, to Rodelillo, Quinta Normal, and Maquehue

25.01.2017 AM
MODIS Terra
natural-color image



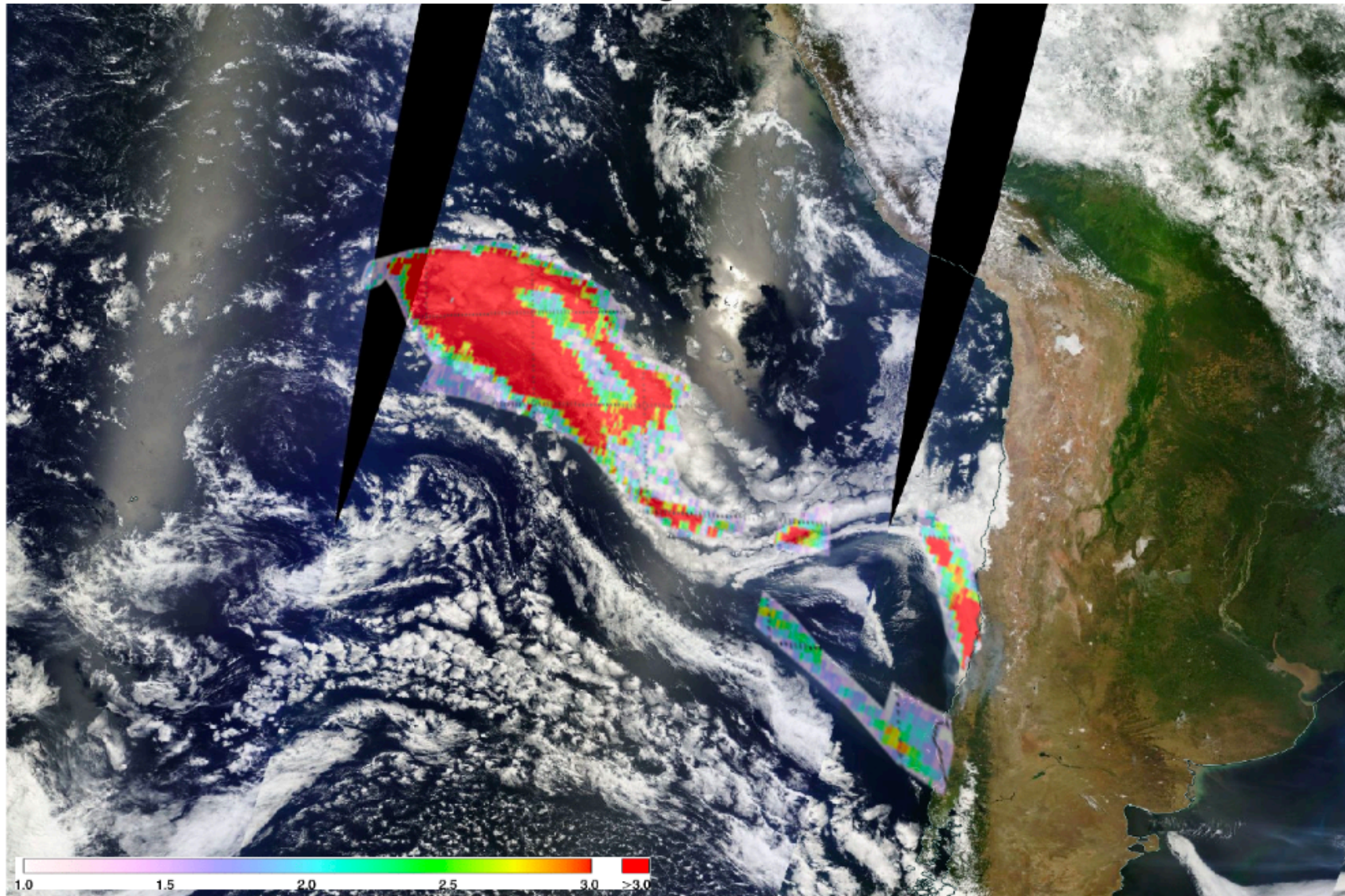
25.01.2017 PM
MODIS Aqua
natural-color image



29-Jan-2017

Absorbing Aerosol Index from GOME-2 A&B over MODIS RGB image of Chile wildfires

Metop-A and -B satellites



Royal Netherlands
Meteorological Institute
Ministry of Infrastructure and the
Environment



EUMETSAT



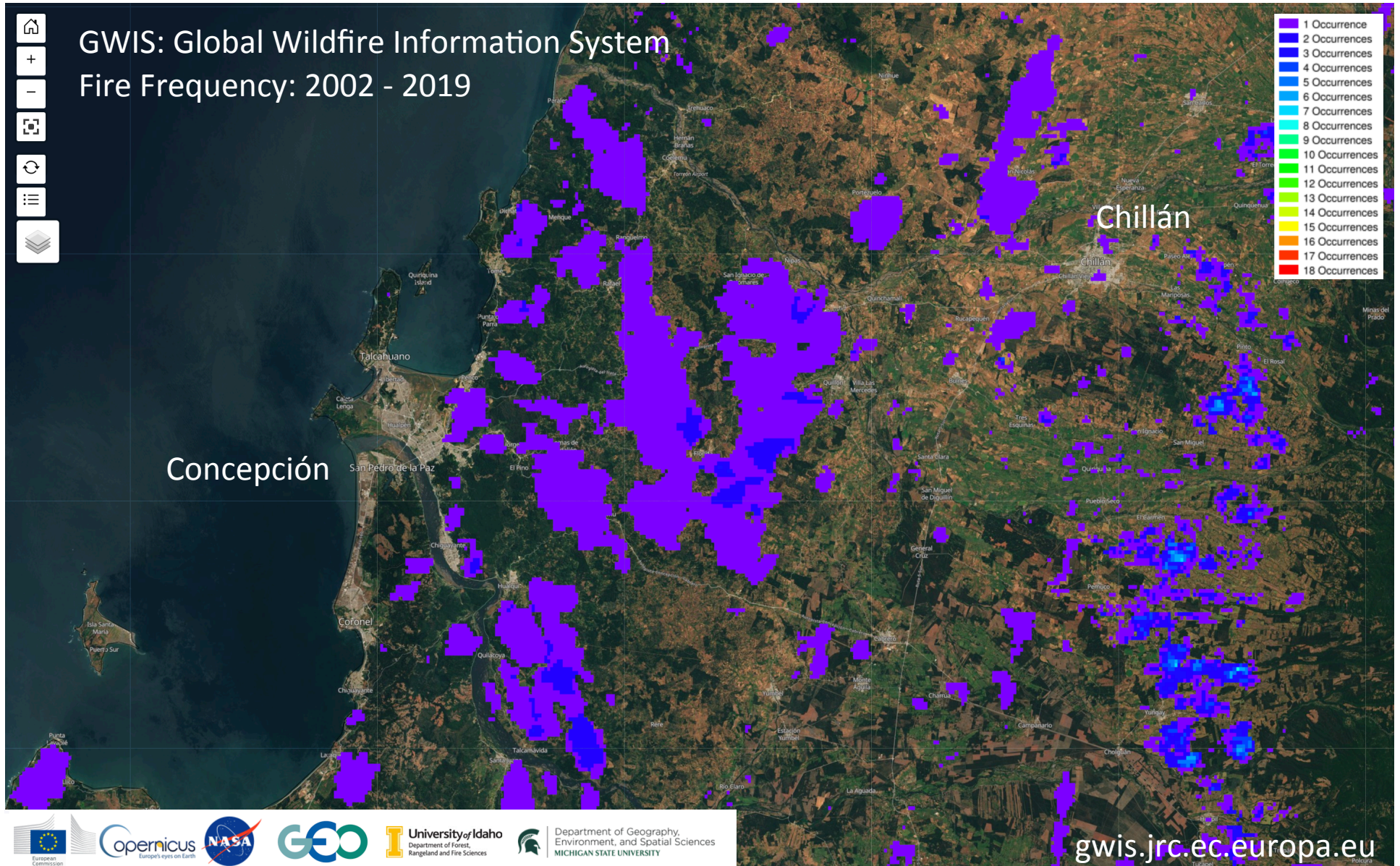
O3M SAF
Ozone and Air quality
Satellite Application Facility



EARTHDATA
Powered by EOSDIS

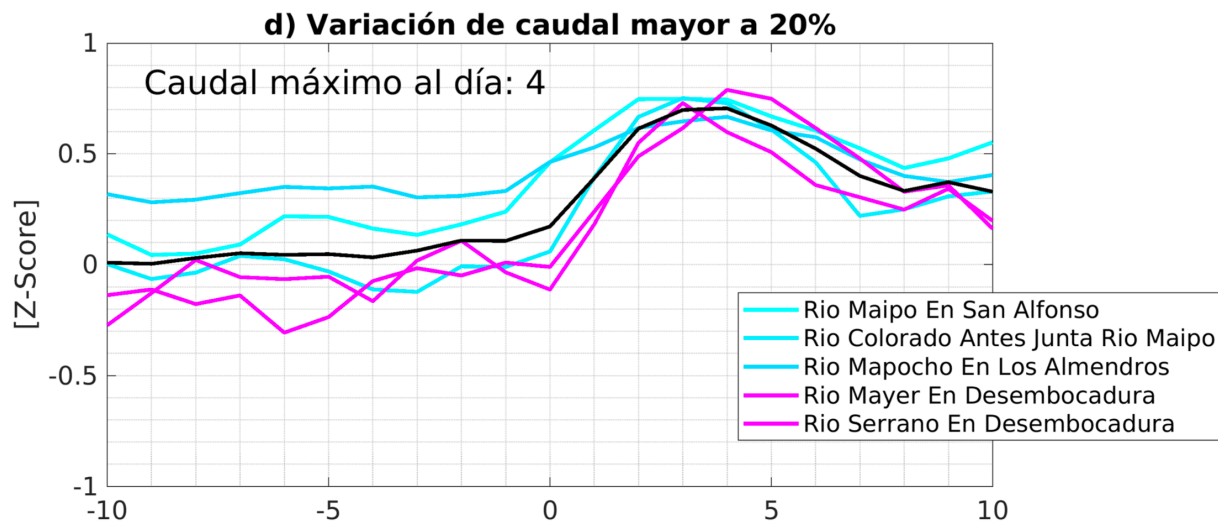
www.eumetsat.int

heat waves and their impacts: *wildfires!*



heat waves and their impacts: *runoff changes*

NDJFM 1980-2016



data: DGA / CAMELS-CL
camels.cr2.cl



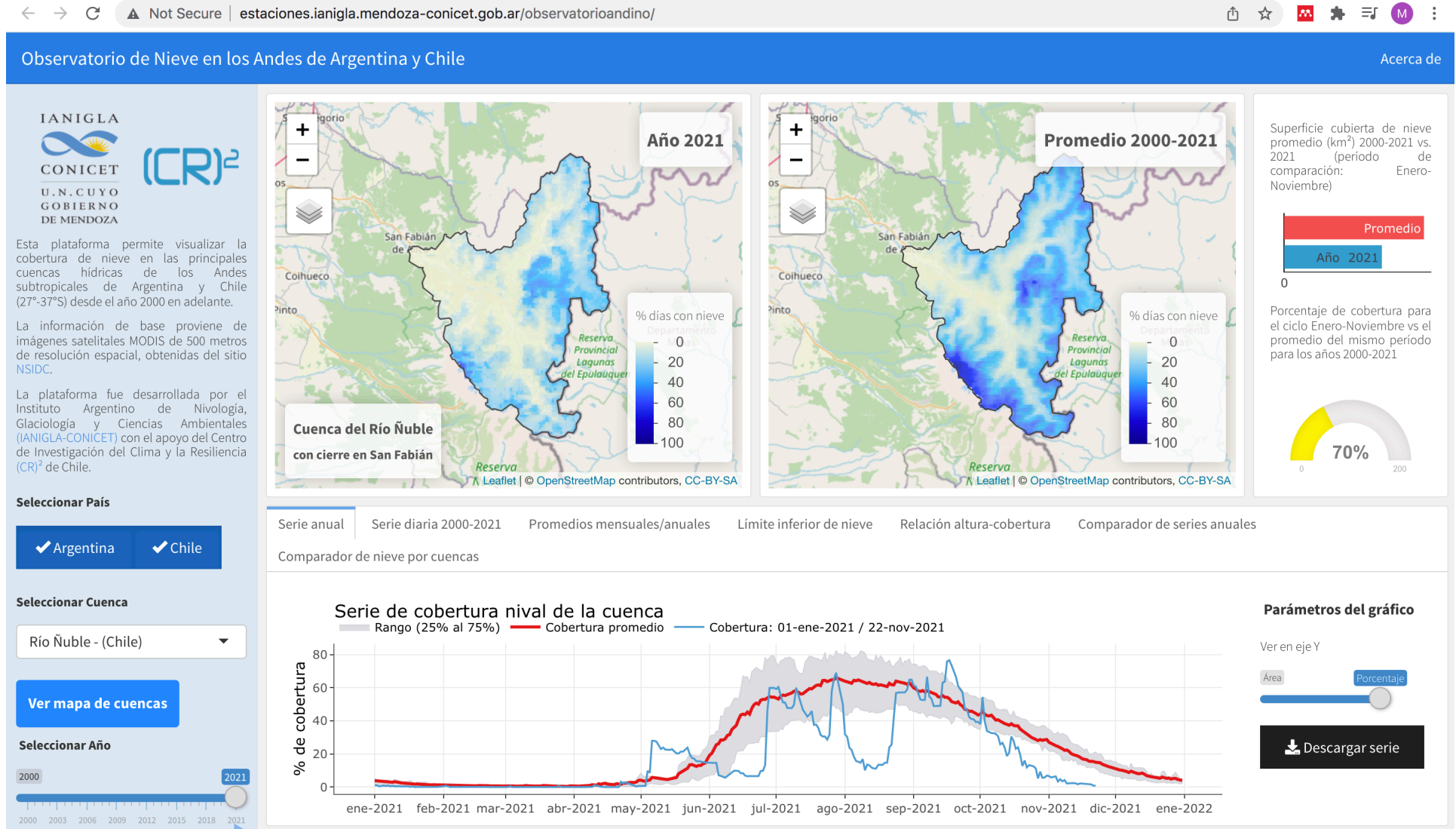
J. Ramírez (thesis, in prep.)

heat waves and their impacts: *runoff changes*

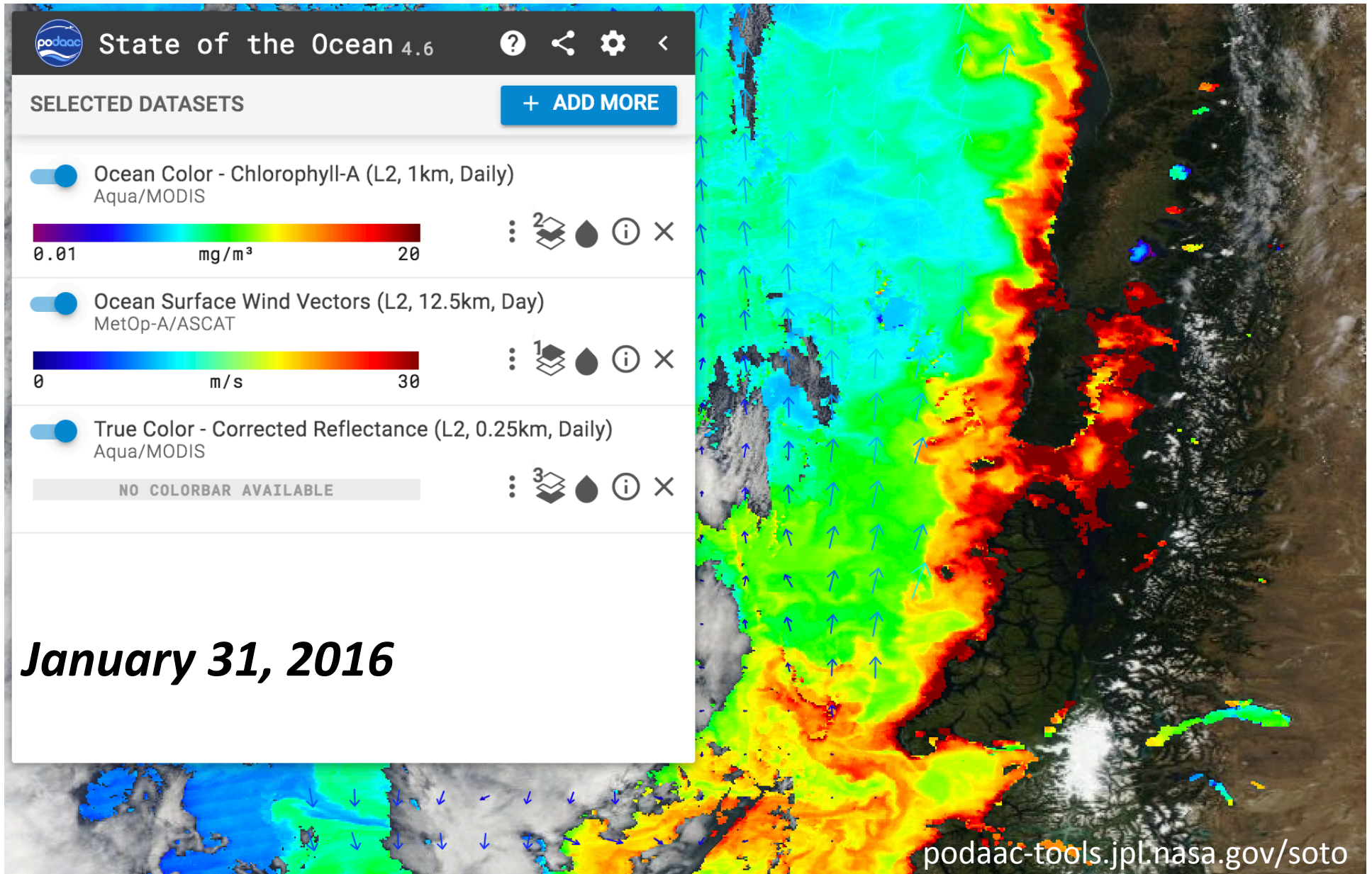
MODIS Aqua & Terra, Normalized Difference Snow Index / NDSI >0.4 -> nieve

$$\text{NDSI} = ((\text{band 4} - \text{band 6}) / (\text{band 4} + \text{band 6}))$$

<https://nsidc.org/support/faq/what-ndsi-snow-cover-and-how-does-it-compare-fsc>



heat waves and their impacts: *algal blooms*?

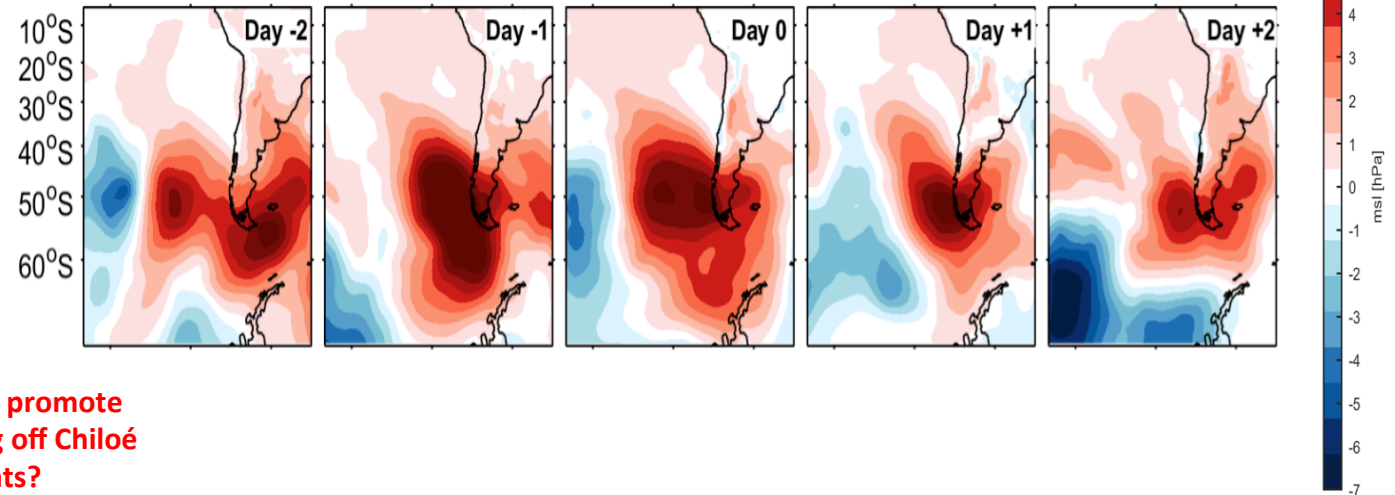


events of high phytoplankton biomass

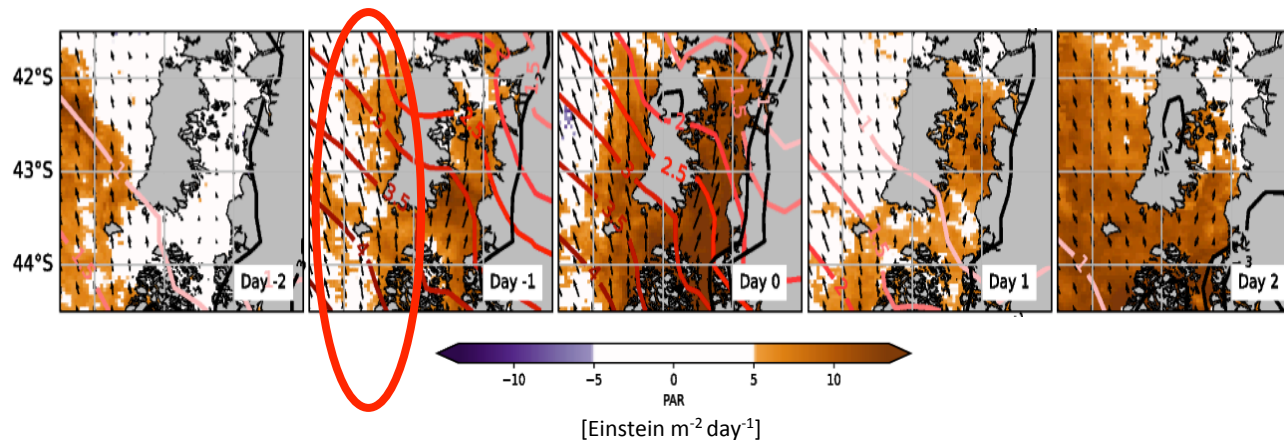
ECMWF ERA5 reanalysis

large scale:

a migratory anticyclone progresses eastward, crossing the southern tip of South America



southerly winds promote
coastal upwelling off Chiloé
→ nutrients?



MODIS-Aqua Photosynthetically Active Radiation (PAR)
level 3, 4 km horizontal resolution

regional scale:

this synoptic pattern promotes clear skies, increased photosynthetically active radiation (PAR), wind anomalies, and changes in coastal circulation

own work (in prep.)



...gracias!

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