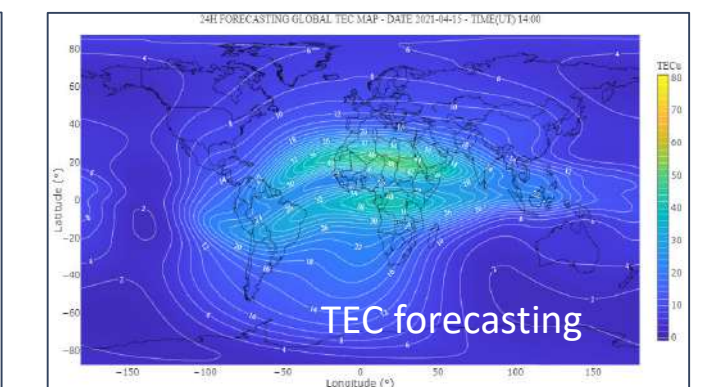
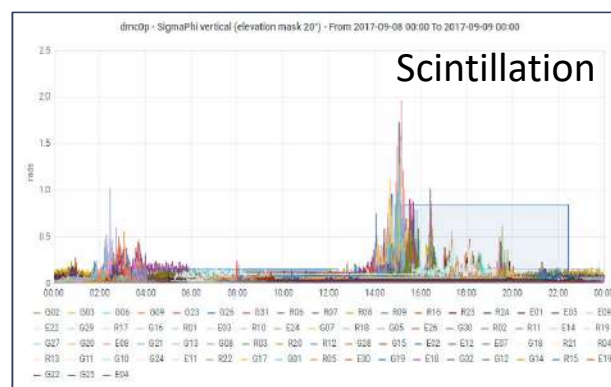
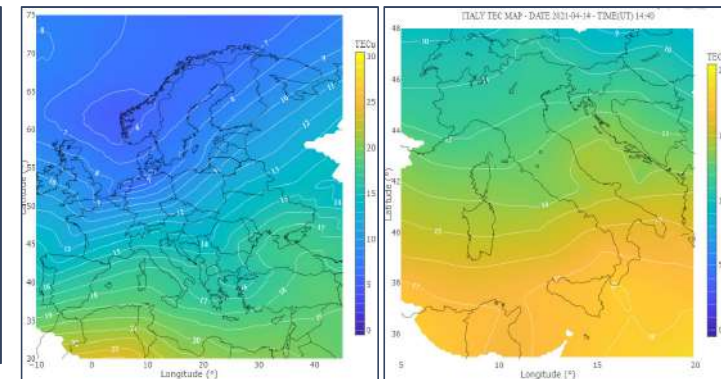
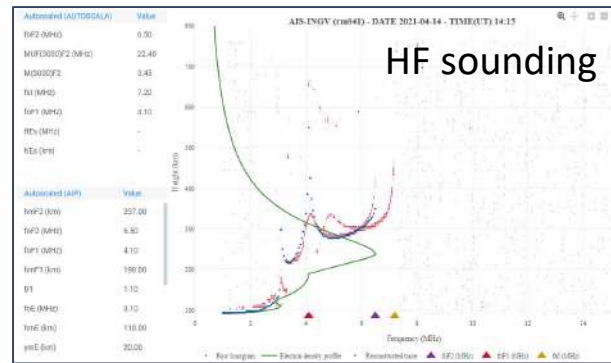
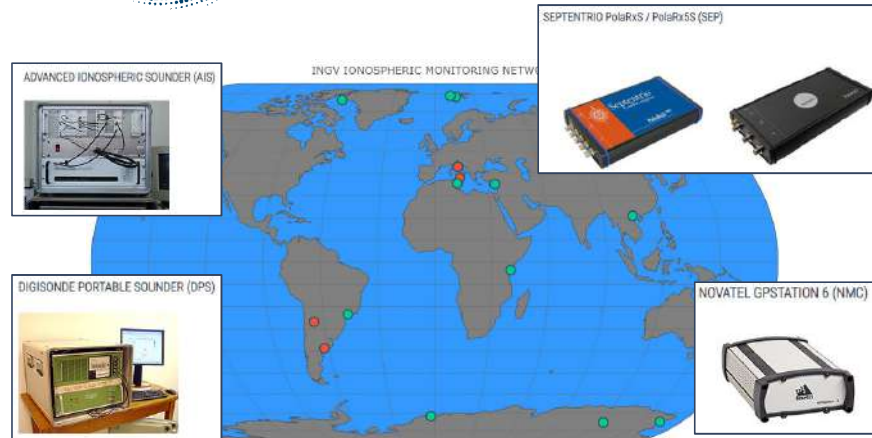




# INGV node overview

## Real-time data

## TEC nowcasting



Cesaroni et al., 2020

INGV developed its own ionograms scaling software named AUTOSCALA

INGV performs continuous HF soundings since 1950 and GNSS ionospheric scintillation measurements since 2003.

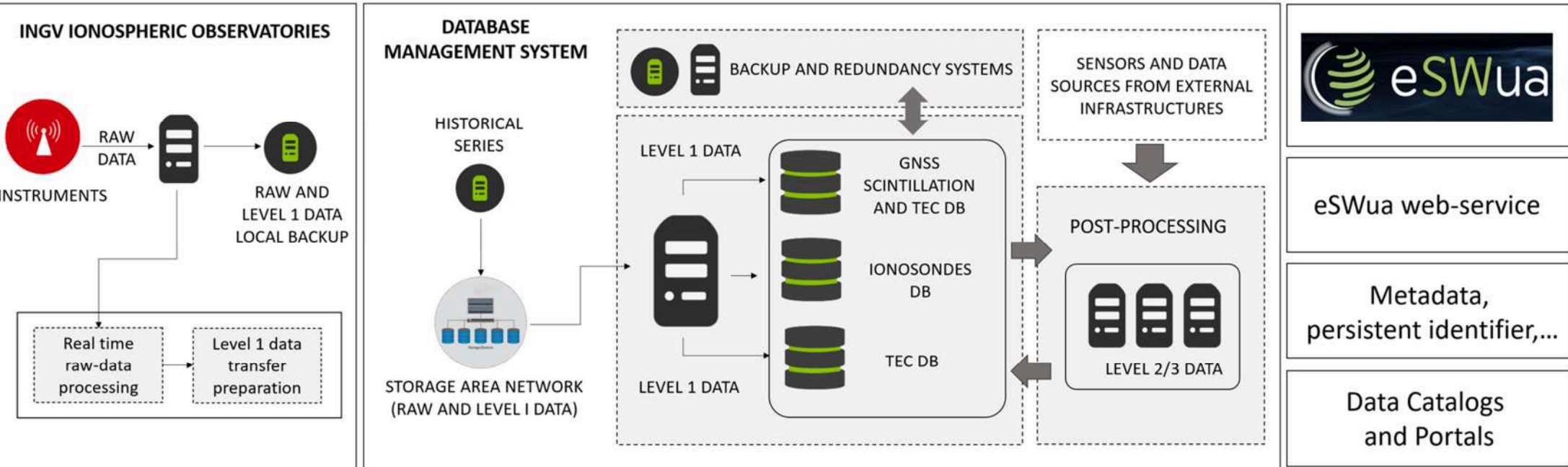


# The back-end: The Space Weather Information Technology (SWIT) system

ACQUISITION AND TRANSMISSION LAYER

DATABASE MANAGEMENT SYSTEM AND POST PROCESSING LAYER

ACCESS AND DISSEMINATION LAYER



RAW DATA

LEVEL 1 DATA

LEVEL 1 DATA PREPARATION

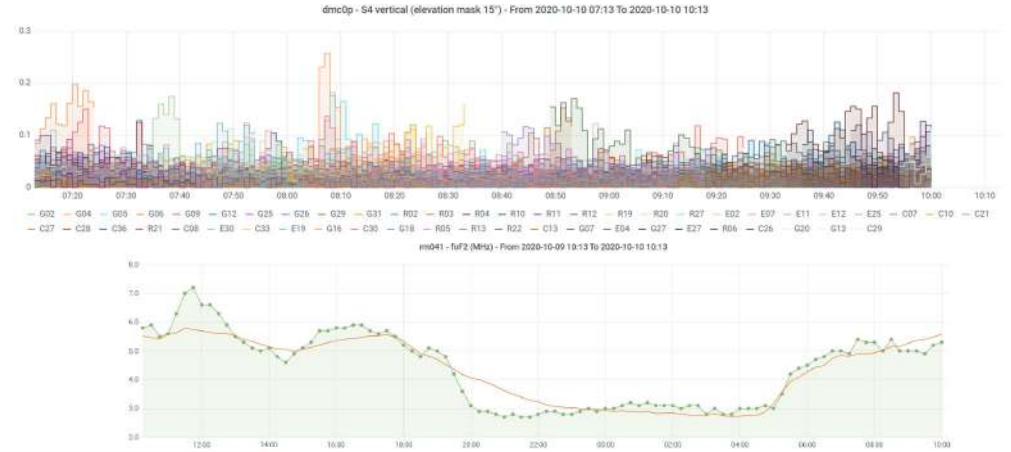
DATABASES INGESTION

HIGHER LEVEL DATA AND PRODUCTS

ONLINE SERVICES ETC.

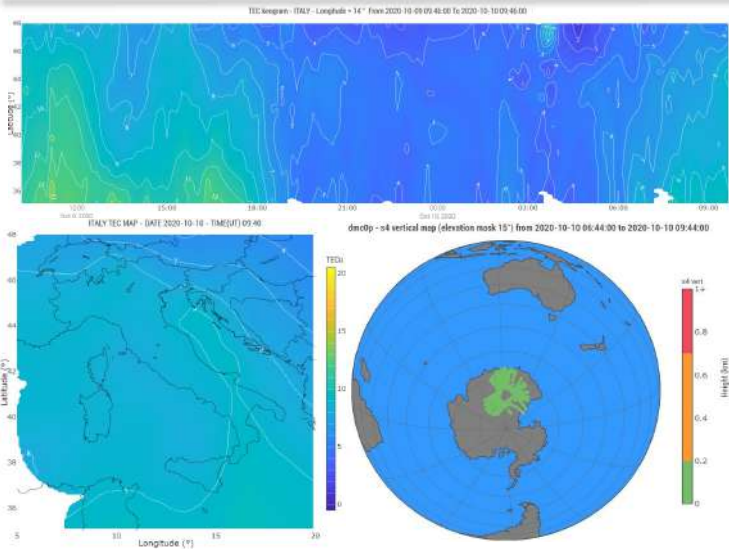


# The front-end: eSWua website (eswua.ingv.it)



## NEAR-REAL TIME ALERTS AND MONITORING

## NEAR-REAL TIME AND HISTORICAL DATA TIME-SERIES



### INTERACTIVE MAPS AND PRODUCTS

## IONOSPHERIC DATA, TOOLS AND SERVICES

- | HF SYSTEM                                                                                                                                                                                                                                                                   | GNSS SCINTILLATION                                                                                                                                                                                                                                                                       | TEC DATA                                                                                                                                                                                                                                                            | DATA ACCESS                                                                                                                                                                                                                                                                        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• NEAR-REAL TIME VERTICAL SOUNDINGS</li> <li>• NEAR REAL-TIME AND HISTORICAL DATA FOR AUTOSCALED AND VALIDATED IONOSPHERIC PARAMETERS</li> <li>• ANALYSIS AND COMPARISON TOOLS</li> <li>• foF2, M(3000)F2 NOWCASTING MAPS</li> </ul> | <ul style="list-style-type: none"> <li>• NEAR REAL-TIME AND HISTORICAL DATA FOR SCINTILLATION INDEX AND GNSS PARAMETERS</li> <li>• S4 SCINTILLATION MAPS</li> <li>• ANALYSIS AND COMPARISON TOOLS</li> <li>• AVAILABILITY OF DATA COLLECTED AT HIGH, MIDDLE AND LOW LATITUDES</li> </ul> | <ul style="list-style-type: none"> <li>• NEAR-REAL TIME ITALY TEC MAPS</li> <li>• NEAR-REAL TIME EUROPE TEC MAPS</li> <li>• NEAR-REAL TIME AND 24H FORECAST WORLD TEC MAPS</li> <li>• MEAN TEC DATA ANALYSIS AND COMPARISON TOOLS</li> <li>• TEC KEOGRAM</li> </ul> | <ul style="list-style-type: none"> <li>• WEBSITE-BASED DOWNLOAD TOOLS</li> <li>• RESTful WEB-SERVICE</li> <li>• JSON INTERCHANGE FORMAT DATA DISTRIBUTION</li> <li>• OPEN AND UNRESTRICTED ACCESS (CC-BY 4.0)</li> <li>• DOI AND INTEROPERABLE METADATA STANDARD (soon)</li> </ul> |