

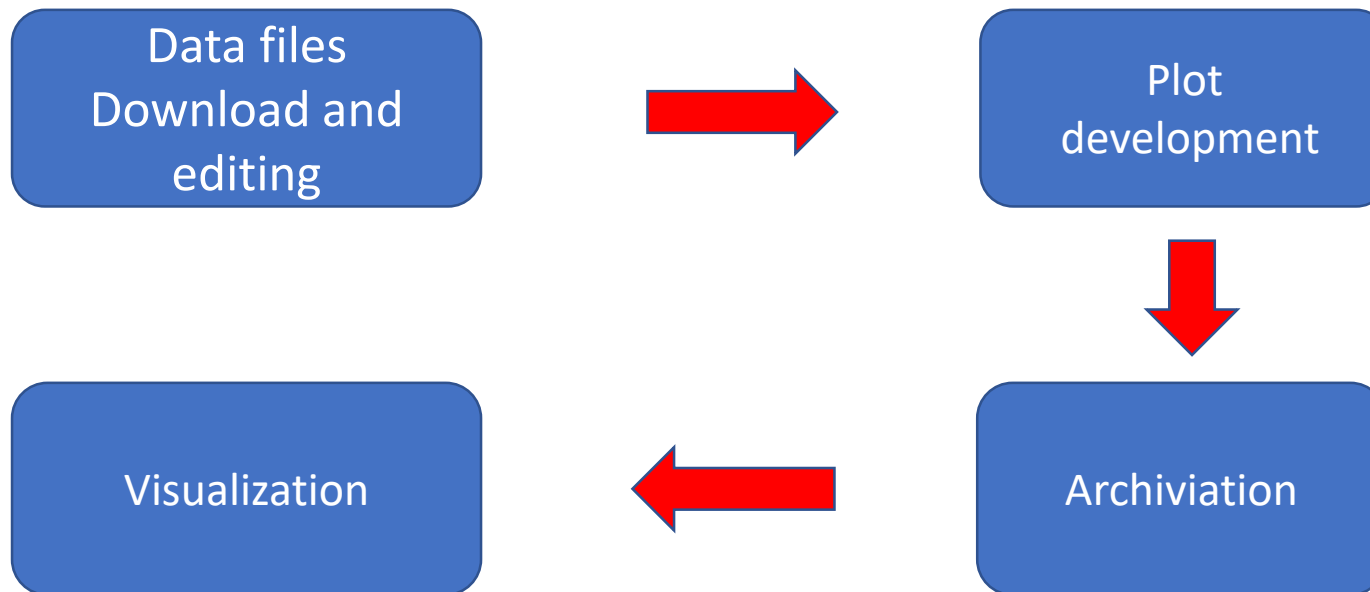
DATA ELABORATION and VISUALIZATION for ADRIACLIM and CASCADE

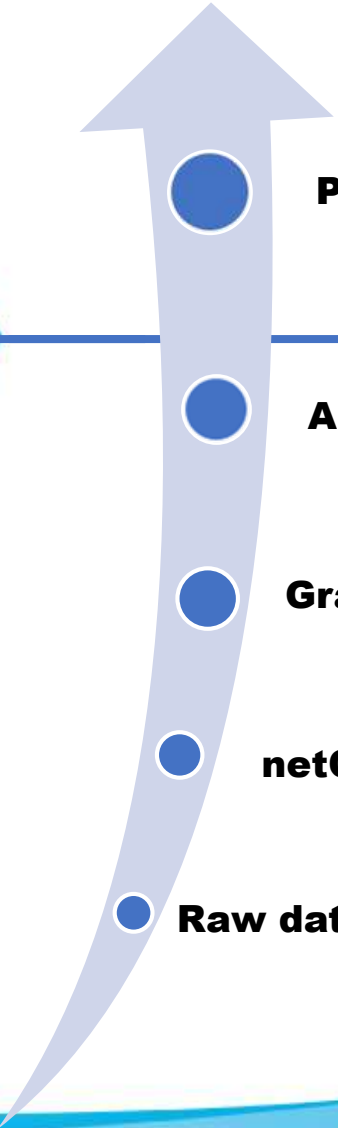
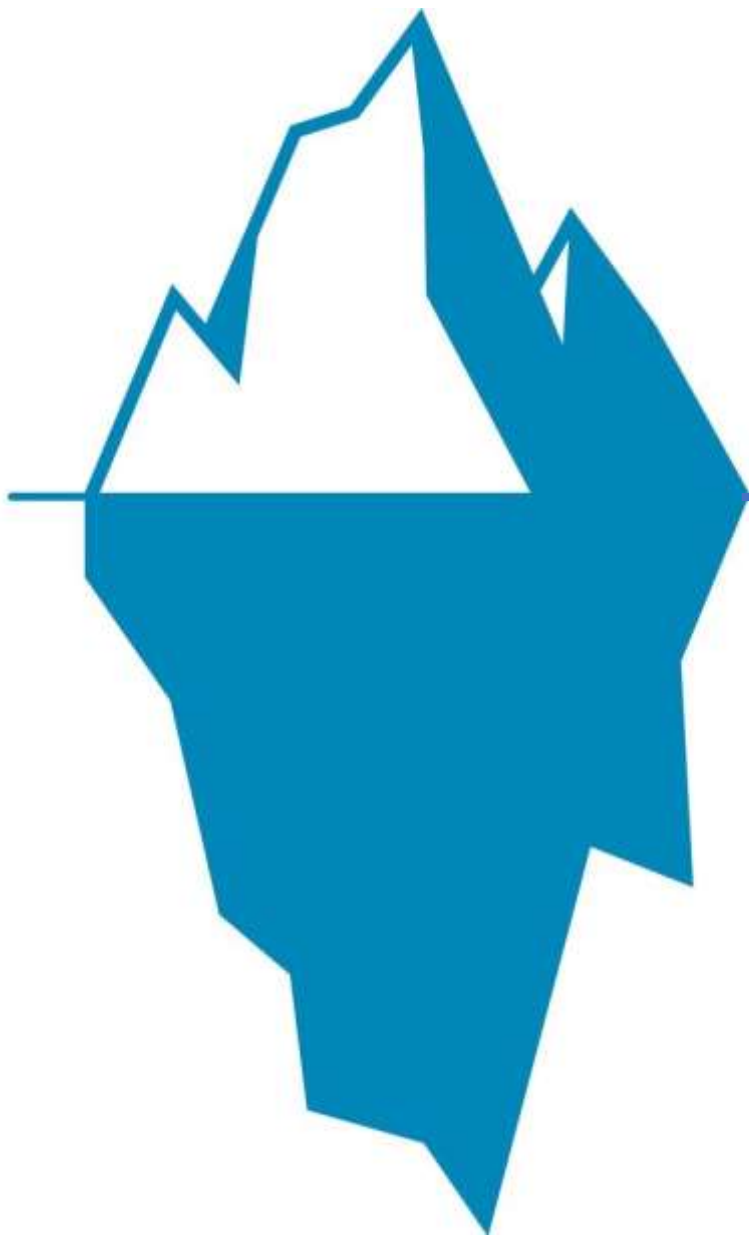
AdriaClim | PP11 | ARPA FVG

Palmanova 5th August 2021

Development of automatization system to visualize forecasts

Macro-Blocks Flow chart:





Raw data Download



netCDF file editing



Graphs development



Archiviation

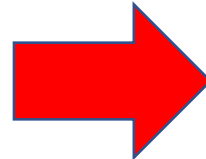


Public HTML web page



Data Download Files: More details

netCDF data files download from
COPERNICUS-Marine Service



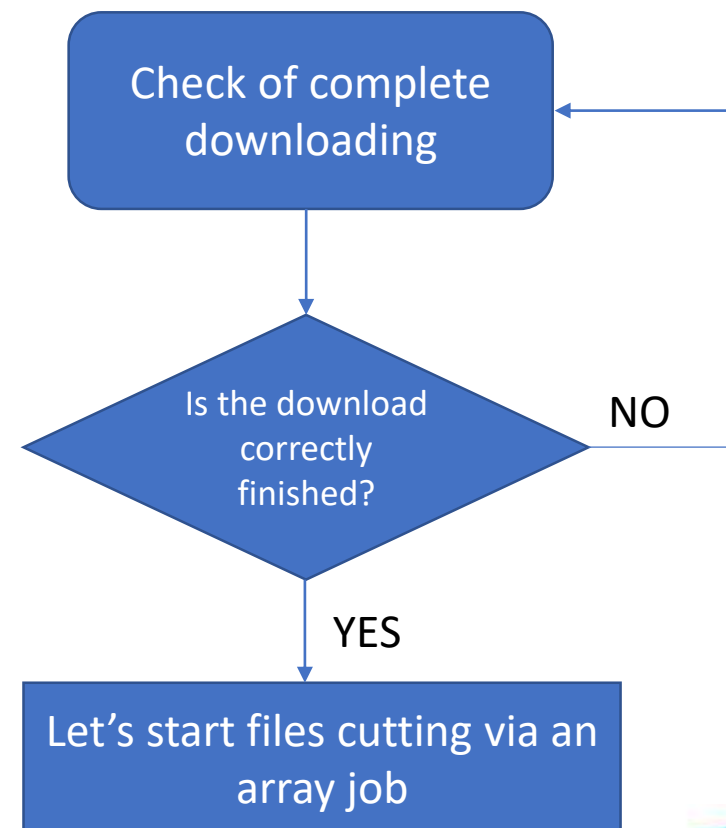
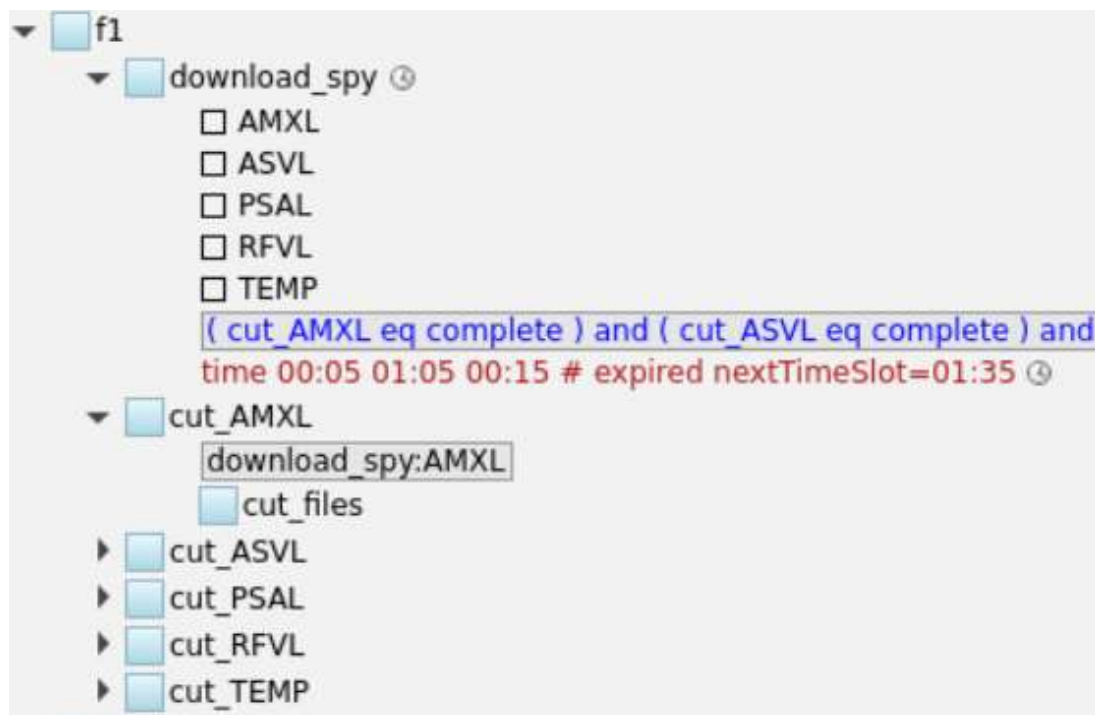
Files Cutting on Adriatic region

- Five days of hourly forecasts (bulletin date included)
- Five files type: Temperature, Currents, Salinity, Water sea Level and mixed layer depth

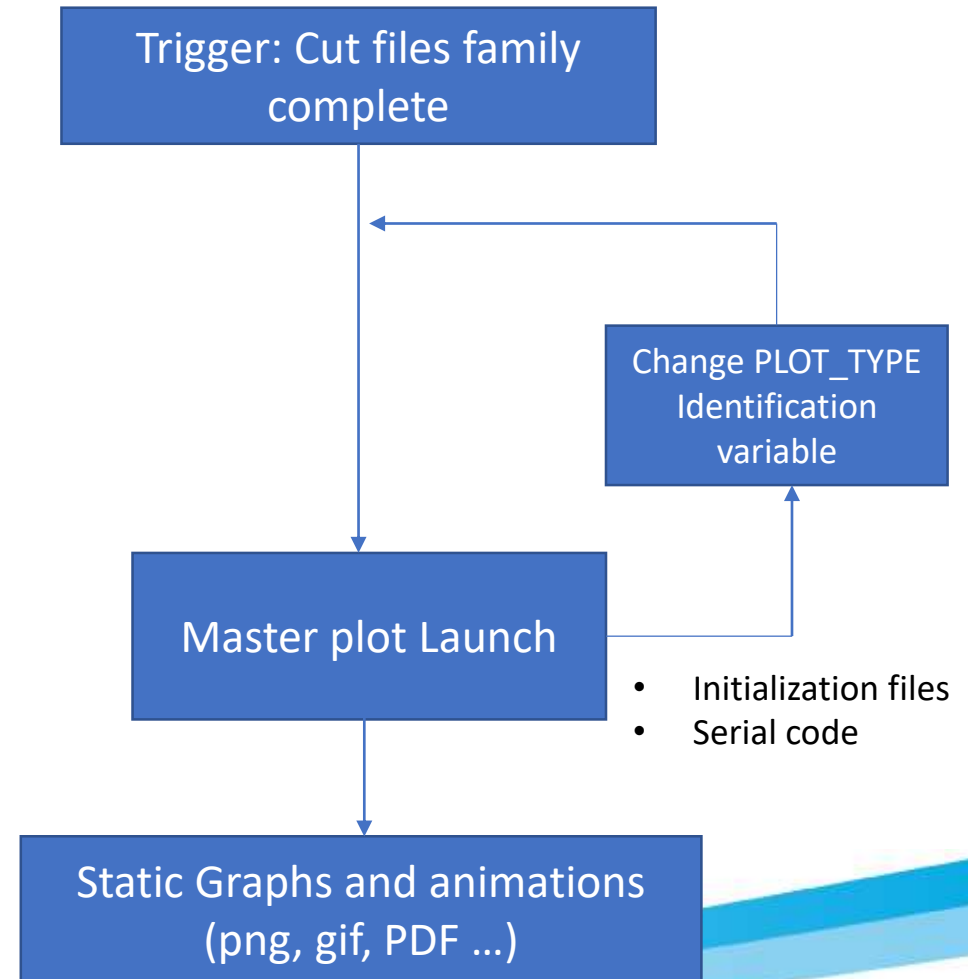
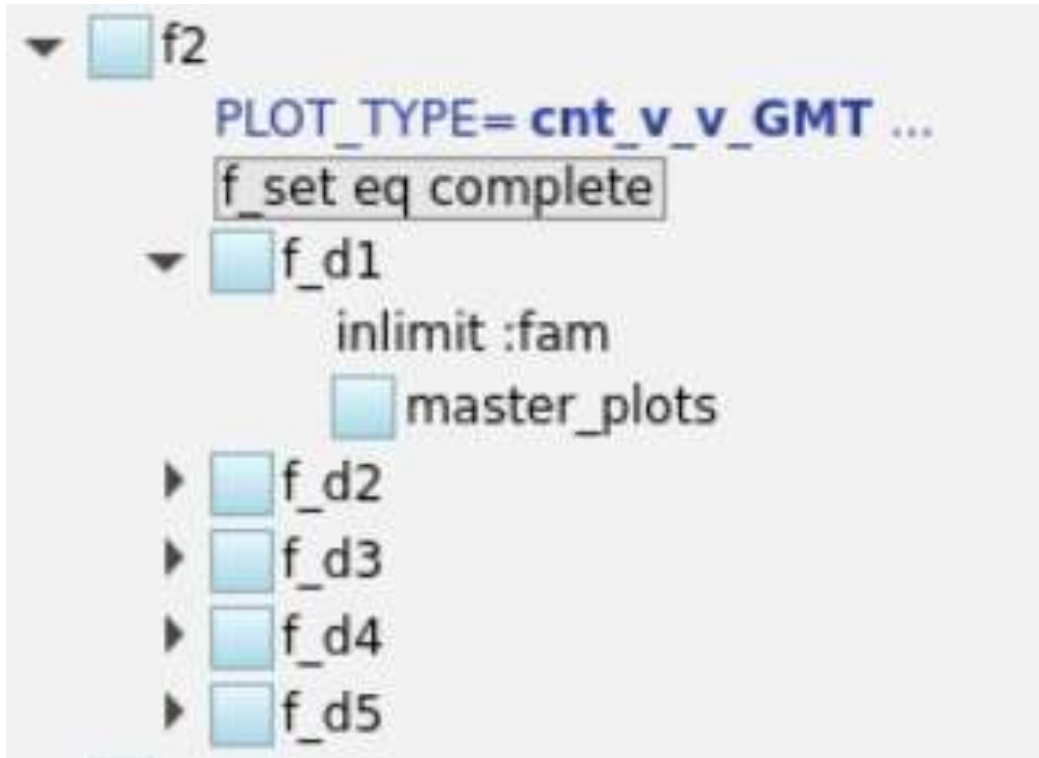


- Latitude: From 39.8 to 46.0 °N
- Longitude: From 11.9 to 19.8 °E

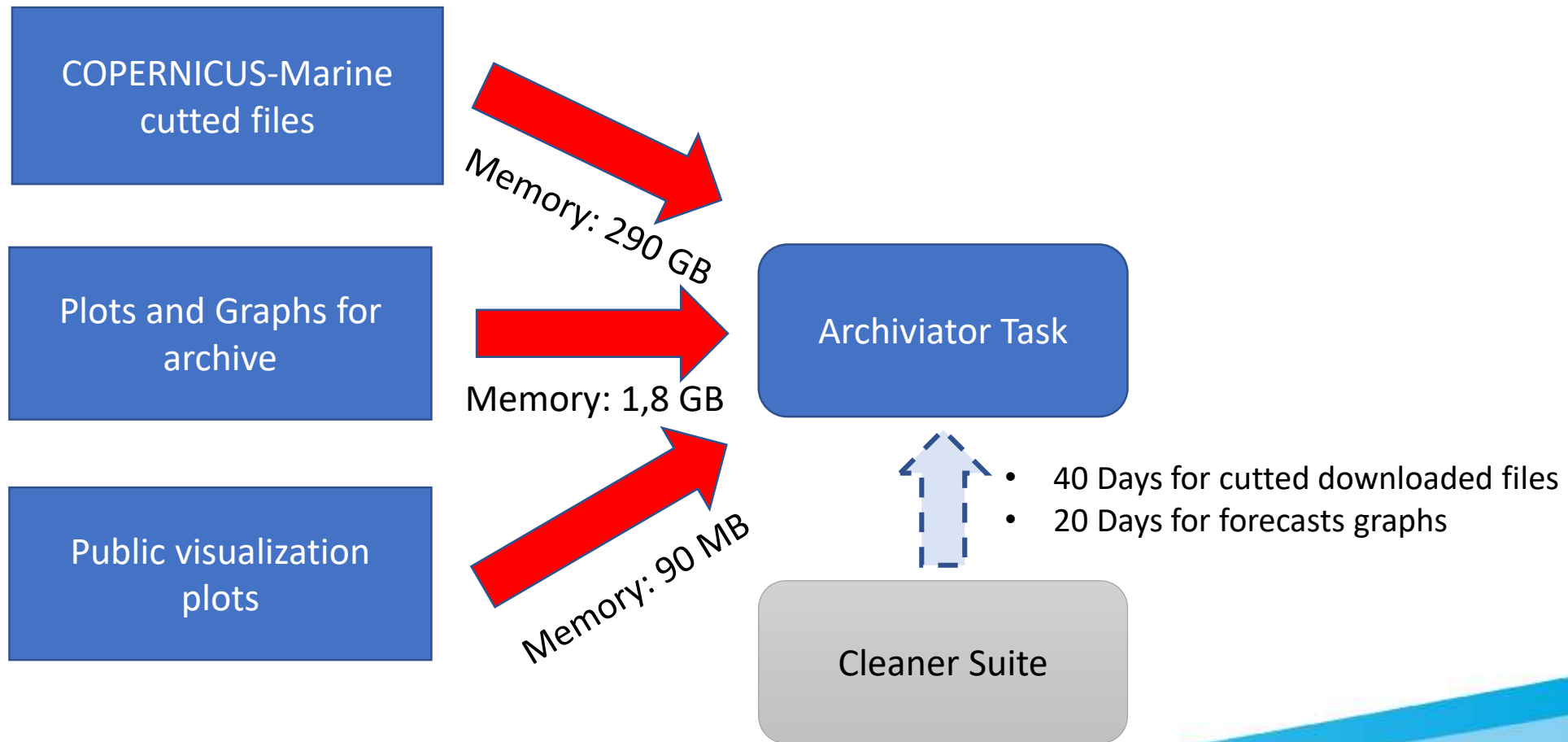
Ecflow implementation



Ecflow Plot Development:

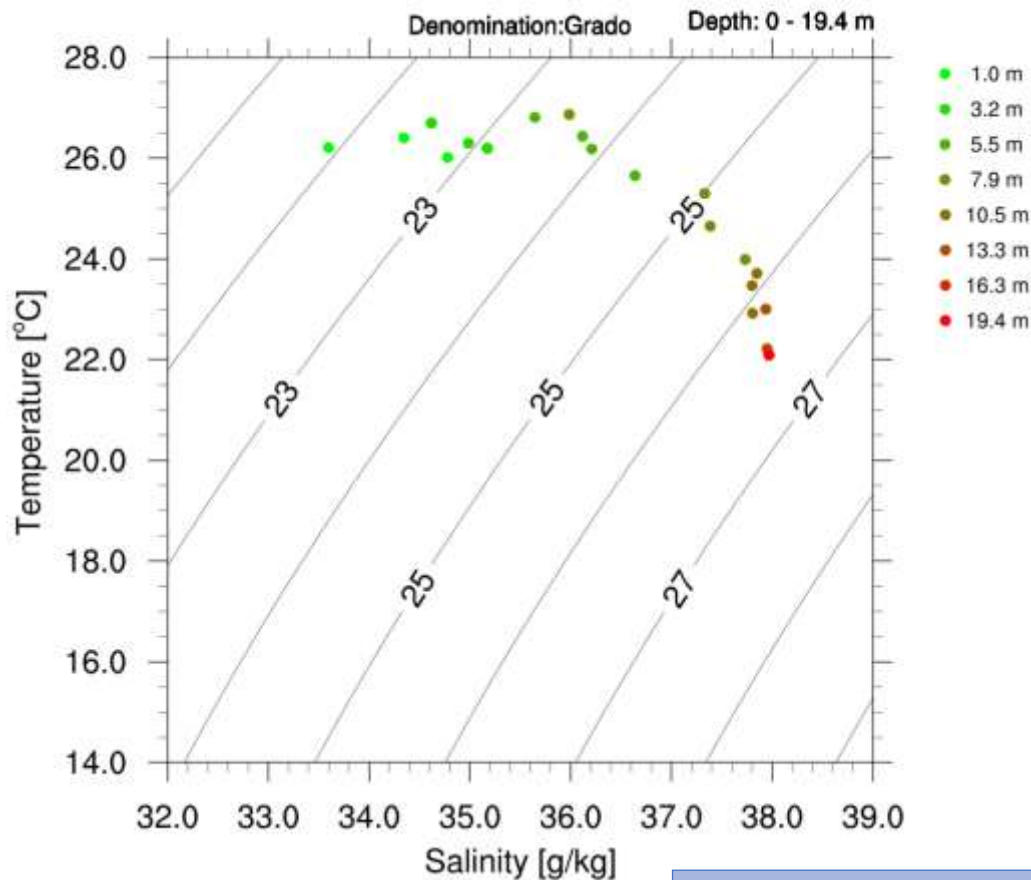


Archiviation and remotion



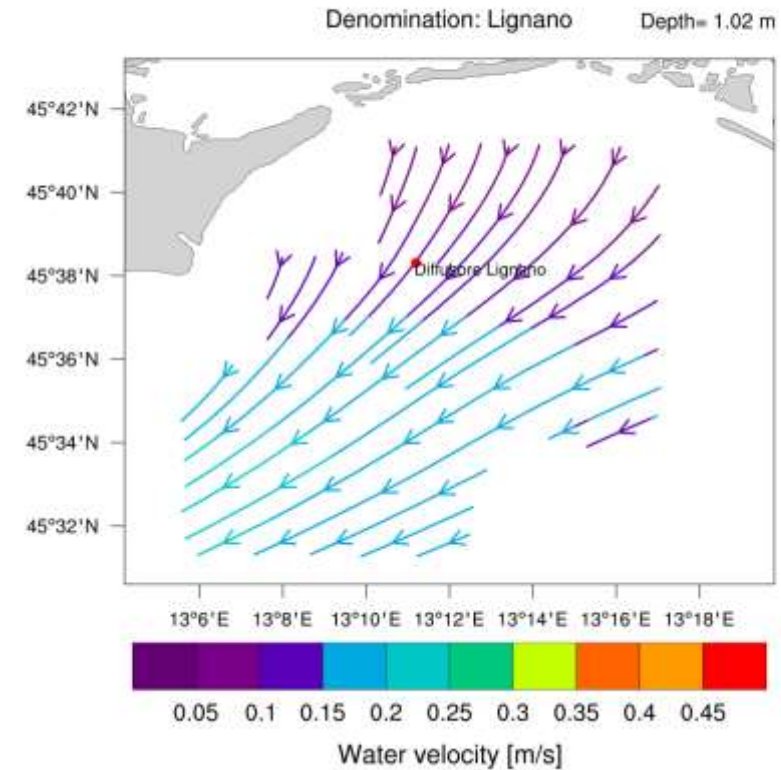
Plots in Details: TS-Diagrams and Marine Currents Streamlines

T-S Diagram at: 2021-07-25 06:30 UTC



TS-Diagram: Grado 25 July 2021 at 06:30 UTC

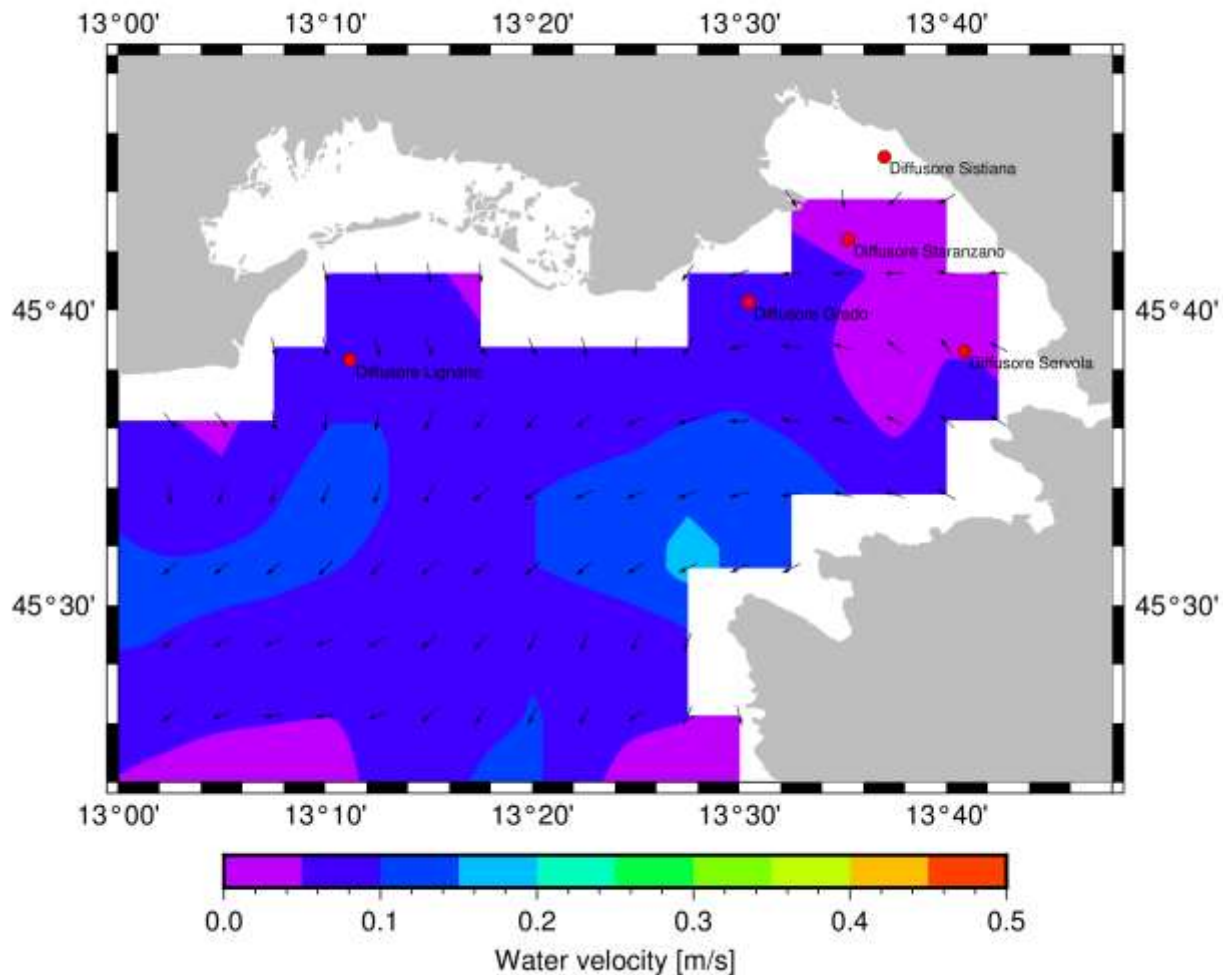
Streamlines currents at: 2021-07-29 00:30 UTC



Streamlines: Lignano 29 July 2021 at 00:30 UTC

Plots in Details: Contour Velocity animation (.gif)

Velocity: Depth= 1.02 m 2021-07-29 00:30 UTC

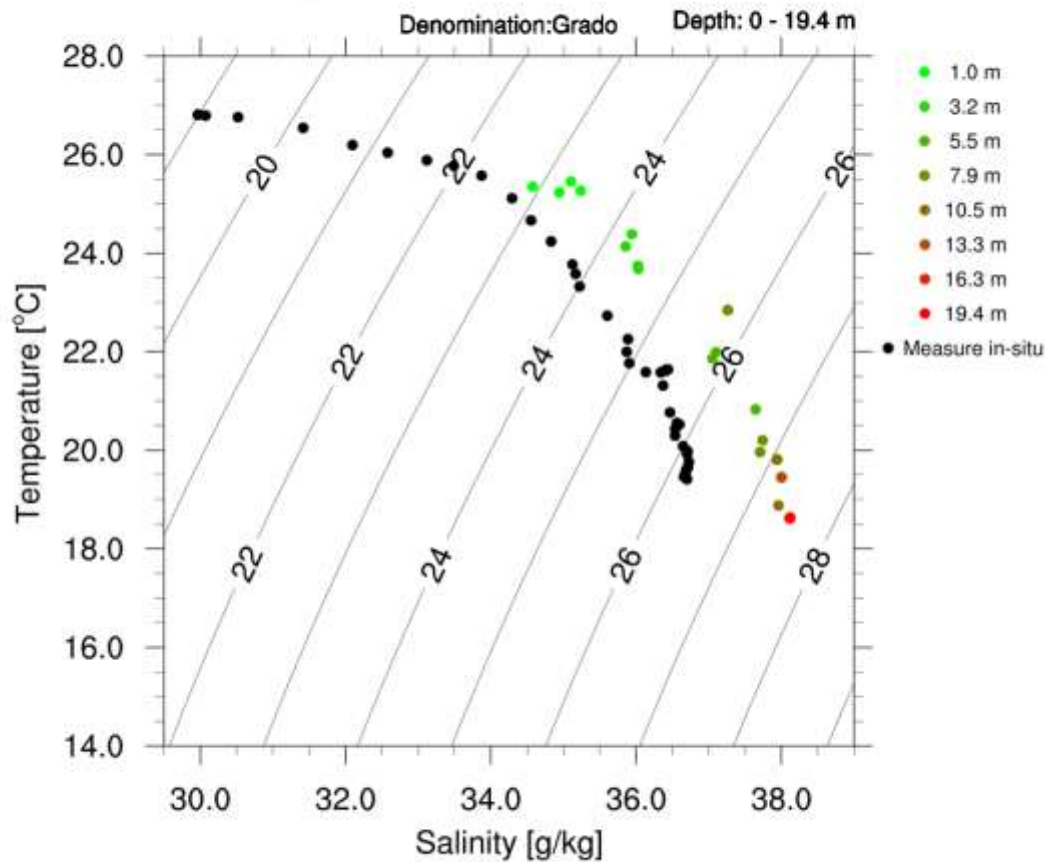


- COPERNICUS-Marine domain
- 1 hour resolution
- Contour velocity module: Color bar
- Versor field for velocity direction
- Software: GMT

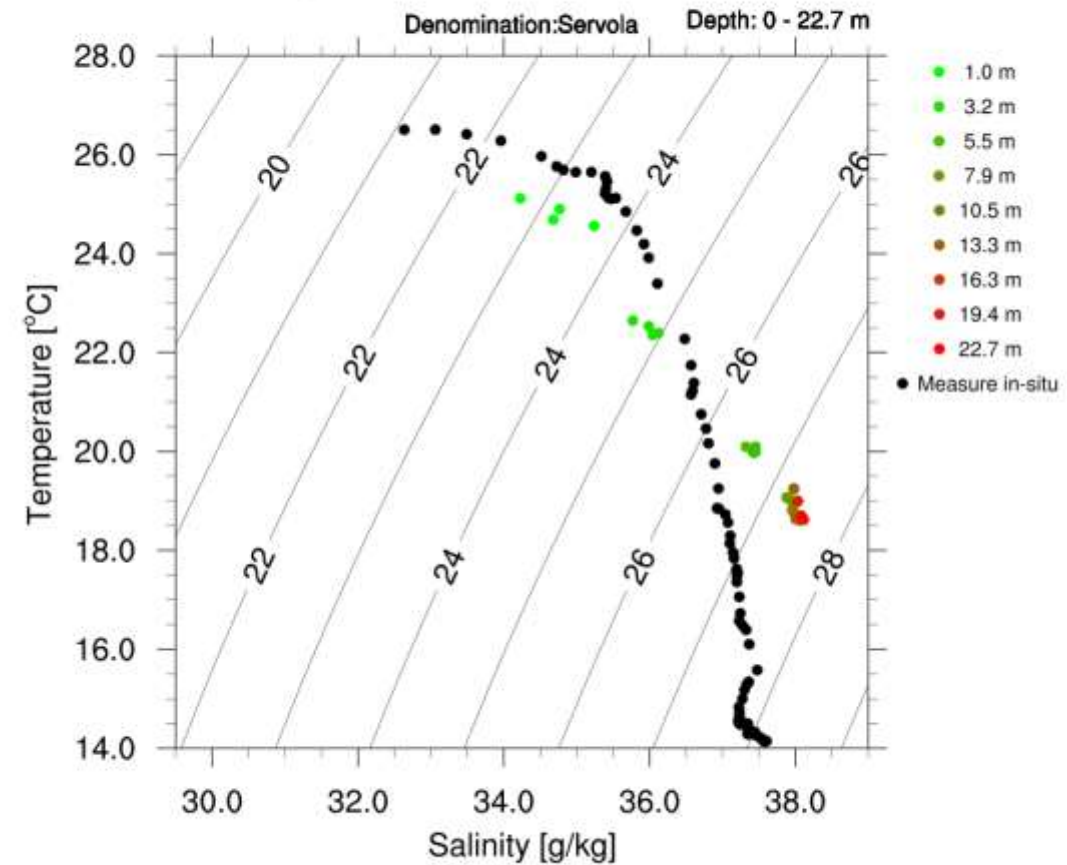
What's the reliability of the forecasts?

Answer: Forecast vs in-situ measures

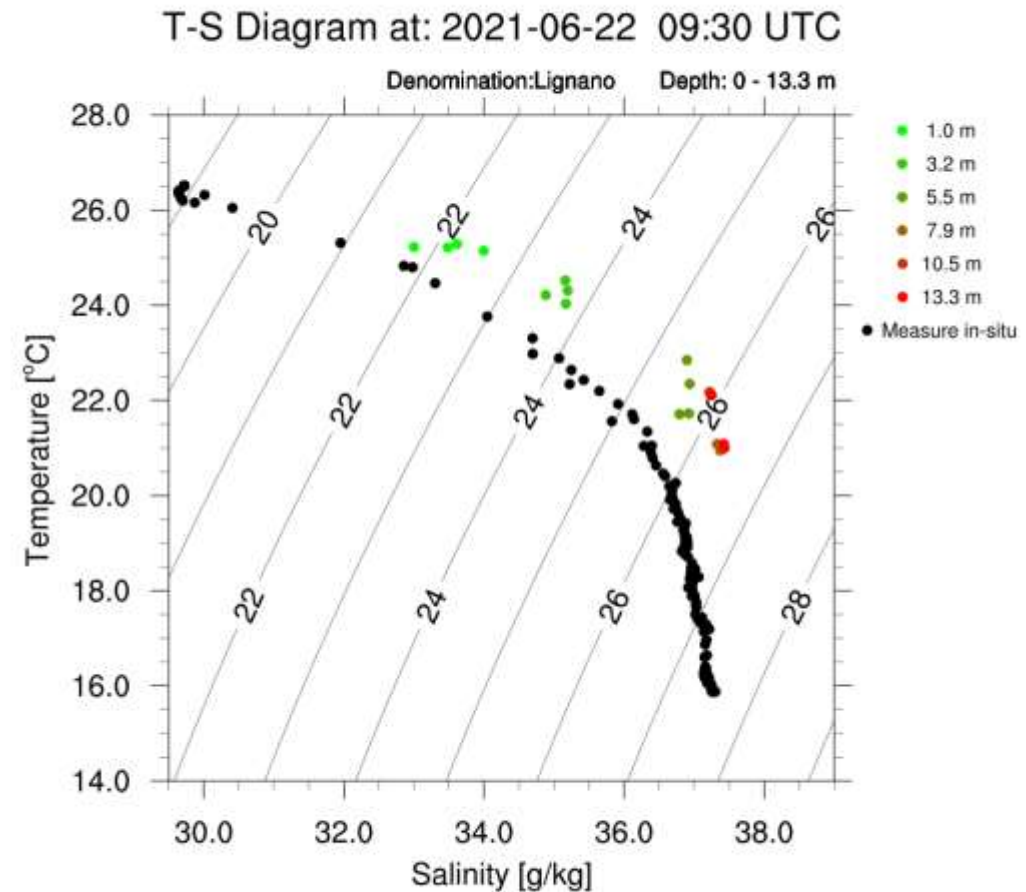
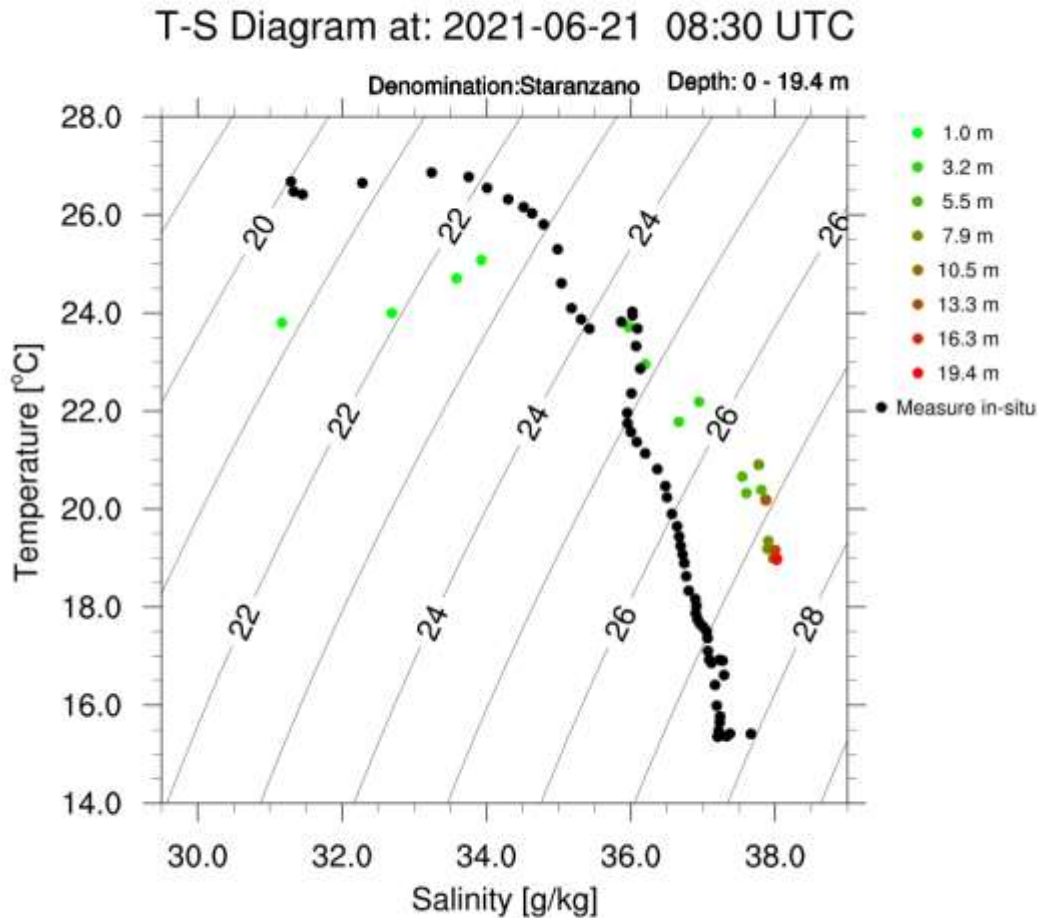
T-S Diagram at: 2021-06-21 09:30 UTC



T-S Diagram at: 2021-06-21 10:30 UTC



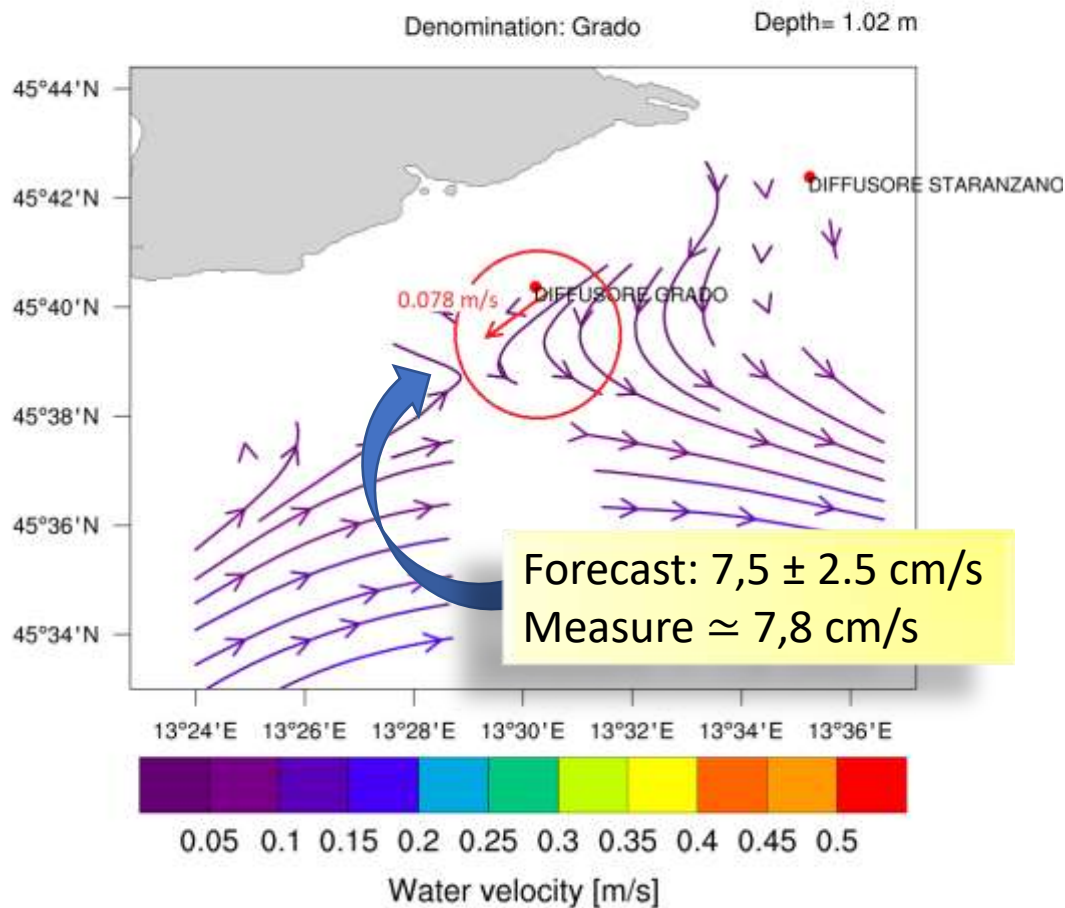
What's the reliability of the forecasts? Answer: Forecast vs in-situ measures



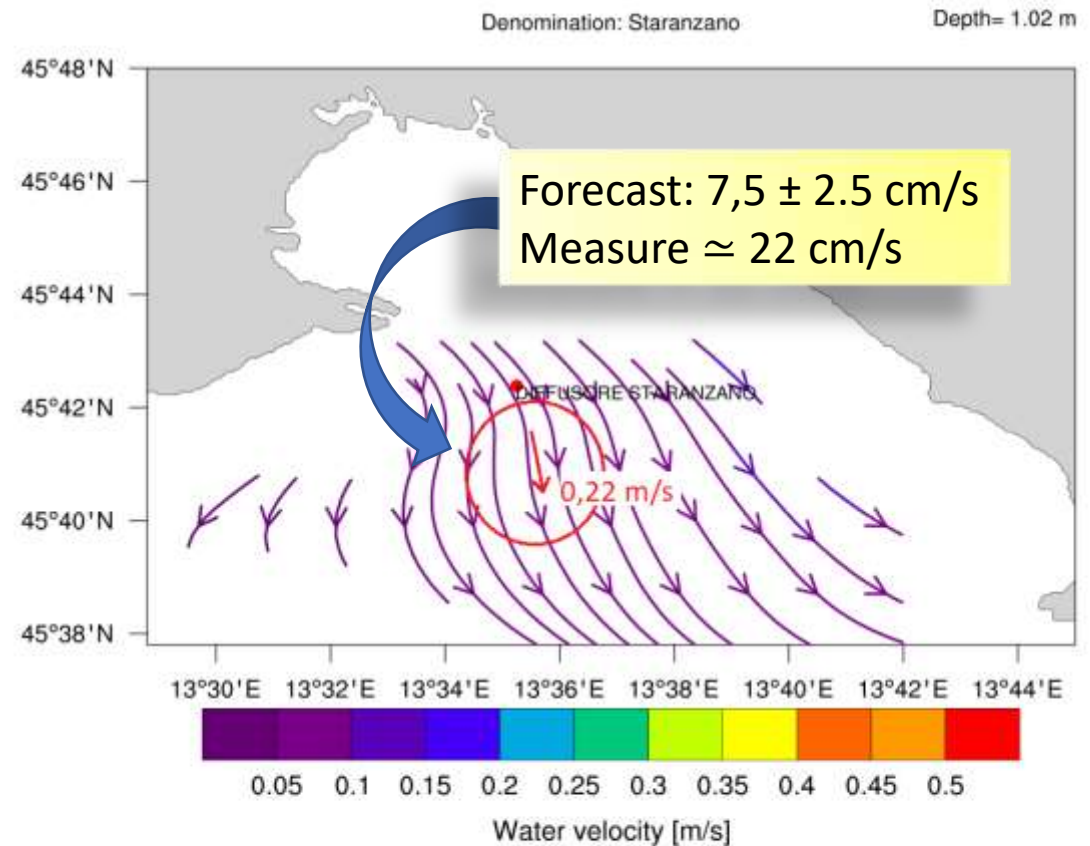
What's the reliability of the forecasts?

Answer: Forecast vs in-situ measurements

Streamlines currents at: 2021-05-04 11:30 UTC

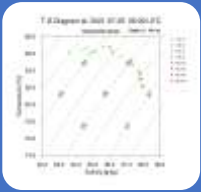


Streamlines currents at: 2021-05-04 12:30 UTC



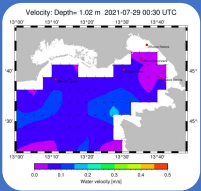
Public share of FORECASTS:

Plots and animations available



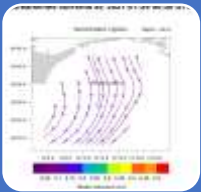
TS Diagrams

- 6 hours step time resolution
- 4 diffusors points: Lignano, Grado, Servola, Staranzano



Contour velocity Animation

- 2 depth levels available: 1 m and 8 m
- Hourly time resolution



Streamlines

- 6 hours step time resolution
- 3 depth levels available (depending on point)
- 4 diffusors points available

Total of 330 plots



<http://interreg.c3hpc.exact-lab.it/CASCADE/>

Web Page Description: Updated plots

Useful link Pages



Interreg IT-HR CASCADE @ ARPA FVG - CRMA

Current date: 2021-07-27



Update Status

Marine forecasts for Northern Adriatic Sea

	+00h 2021-07-26 (bulletin date)	+24h 2021-07-27	+48h 2021-07-28	+72h 2021-07-29	+96h 2021-07-30
<p>Date of update: 2021-07-27 Files are correctly updated</p>					
TS-Diagrams	Grado: 00:30 06:30 12:30 18:30 Lignano: 00:30 06:30 12:30 18:30 Servola: 00:30 06:30 12:30 18:30 Staranzano: 00:30 06:30 12:30 18:30	Grado: 00:30 06:30 12:30 18:30 Lignano: 00:30 06:30 12:30 18:30 Servola: 00:30 06:30 12:30 18:30 Staranzano: 00:30 06:30 12:30 18:30	Grado: 00:30 06:30 12:30 18:30 Lignano: 00:30 06:30 12:30 18:30 Servola: 00:30 06:30 12:30 18:30 Staranzano: 00:30 06:30 12:30 18:30	Grado: 00:30 06:30 12:30 18:30 Lignano: 00:30 06:30 12:30 18:30 Servola: 00:30 06:30 12:30 18:30 Staranzano: 00:30 06:30 12:30 18:30	Grado: 00:30 06:30 12:30 18:30 Lignano: 00:30 06:30 12:30 18:30 Servola: 00:30 06:30 12:30 18:30 Staranzano: 00:30 06:30 12:30 18:30
Contour-Velocity	1.0 m Depth 7.9 m Depth	1.0 m Depth 7.9 m Depth	1.0 m Depth 7.9 m Depth	1.0 m Depth 7.9 m Depth	1.0 m Depth 7.9 m Depth
Streamlines	Grado: Depth 1.0 m: 00:30 06:30 12:30 18:30 Depth 5.5 m: 00:30 06:30 12:30 18:30 Depth 10.5 m: 00:30 06:30 12:30 18:30 Lignano: Depth 1.0 m: 00:30 06:30 12:30 18:30 Depth 5.5 m: 00:30 06:30 12:30 18:30 Depth 10.5 m: 00:30 06:30 12:30 18:30 Servola: Depth 1.0 m: 00:30 06:30 12:30 18:30 Depth 5.5 m: 00:30 06:30 12:30 18:30 Depth 13.3 m: 00:30 06:30 12:30 18:30	Grado: Depth 1.0 m: 00:30 06:30 12:30 18:30 Depth 5.5 m: 00:30 06:30 12:30 18:30 Depth 10.5 m: 00:30 06:30 12:30 18:30 Lignano: Depth 1.0 m: 00:30 06:30 12:30 18:30 Depth 5.5 m: 00:30 06:30 12:30 18:30 Depth 10.5 m: 00:30 06:30 12:30 18:30 Servola: Depth 1.0 m: 00:30 06:30 12:30 18:30 Depth 5.5 m: 00:30 06:30 12:30 18:30 Depth 13.3 m: 00:30 06:30 12:30 18:30	Grado: Depth 1.0 m: 00:30 06:30 12:30 18:30 Depth 5.5 m: 00:30 06:30 12:30 18:30 Depth 10.5 m: 00:30 06:30 12:30 18:30 Lignano: Depth 1.0 m: 00:30 06:30 12:30 18:30 Depth 5.5 m: 00:30 06:30 12:30 18:30 Depth 10.5 m: 00:30 06:30 12:30 18:30 Servola: Depth 1.0 m: 00:30 06:30 12:30 18:30 Depth 5.5 m: 00:30 06:30 12:30 18:30 Depth 13.3 m: 00:30 06:30 12:30 18:30	Grado: Depth 1.0 m: 00:30 06:30 12:30 18:30 Depth 5.5 m: 00:30 06:30 12:30 18:30 Depth 10.5 m: 00:30 06:30 12:30 18:30 Lignano: Depth 1.0 m: 00:30 06:30 12:30 18:30 Depth 5.5 m: 00:30 06:30 12:30 18:30 Depth 10.5 m: 00:30 06:30 12:30 18:30 Servola: Depth 1.0 m: 00:30 06:30 12:30 18:30 Depth 5.5 m: 00:30 06:30 12:30 18:30 Depth 13.3 m: 00:30 06:30 12:30 18:30	Grado: Depth 1.0 m: 00:30 06:30 12:30 18:30 Depth 5.5 m: 00:30 06:30 12:30 18:30 Depth 10.5 m: 00:30 06:30 12:30 18:30 Lignano: Depth 1.0 m: 00:30 06:30 12:30 18:30 Depth 5.5 m: 00:30 06:30 12:30 18:30 Depth 10.5 m: 00:30 06:30 12:30 18:30 Servola: Depth 1.0 m: 00:30 06:30 12:30 18:30 Depth 5.5 m: 00:30 06:30 12:30 18:30 Depth 13.3 m: 00:30 06:30 12:30 18:30

Forecast: Absolute Dates

Plot Types



Web Page Description: Not updated plots

Current date: 2021-07-27

Update Status

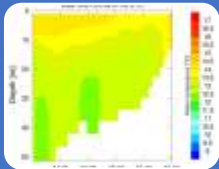
Date of update: 2021-07-27
Warning: Files are not daily updated

Marine forecasts for Northern Adriatic Sea

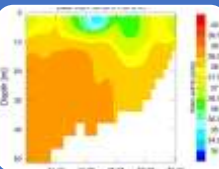
	+00h (bulletin date)	+24h	+48h	+72h	+96h
TS-Diagrams	Grado: 00:30 06:30 12:30 18:30 Lignano: 00:30 06:30 12:30 18:30 Servola: 00:30 06:30 12:30 18:30 Staranzano: 00:30 06:30 12:30 18:30	Grado: 00:30 06:30 12:30 18:30 Lignano: 00:30 06:30 12:30 18:30 Servola: 00:30 06:30 12:30 18:30 Staranzano: 00:30 06:30 12:30 18:30	Grado: 00:30 06:30 12:30 18:30 Lignano: 00:30 06:30 12:30 18:30 Servola: 00:30 06:30 12:30 18:30 Staranzano: 00:30 06:30 12:30 18:30	Grado: 00:30 06:30 12:30 18:30 Lignano: 00:30 06:30 12:30 18:30 Servola: 00:30 06:30 12:30 18:30 Staranzano: 00:30 06:30 12:30 18:30	Grado: 00:30 06:30 12:30 18:30 Lignano: 00:30 06:30 12:30 18:30 Servola: 00:30 06:30 12:30 18:30 Staranzano: 00:30 06:30 12:30 18:30
Contour-Velocity	1.0 m Depth 7.9 m Depth	1.0 m Depth 7.9 m Depth	1.0 m Depth	1.0 m Depth	1.0 m Depth 7.9 m Depth
Streamlines	<p>Grado:</p> Depth 1.0 m: 00:30 06:30 12:30 18:30 Depth 5.5 m: 00:30 06:30 12:30 18:30 Depth 10.5 m: 00:30 06:30 12:30 18:30	<p>Grado:</p> Depth 1.0 m: 00:30 06:30 12:30 18:30 Depth 5.5 m: 00:30 06:30 12:30 18:30 Depth 10.5 m: 00:30 06:30 12:30 18:30	<p>Grado:</p> Depth 1.0 m: 00:30 06:30 12:30 18:30 Depth 5.5 m: 00:30 06:30 12:30 18:30 Depth 10.5 m: 00:30 06:30 12:30 18:30	<p>Grado:</p> Depth 1.0 m: 00:30 06:30 12:30 18:30 Depth 5.5 m: 00:30 06:30 12:30 18:30 Depth 10.5 m: 00:30 06:30 12:30 18:30	<p>Grado:</p> Depth 1.0 m: 00:30 06:30 12:30 18:30 Depth 5.5 m: 00:30 06:30 12:30 18:30 Depth 10.5 m: 00:30 06:30 12:30 18:30

Forecasts: Relative time

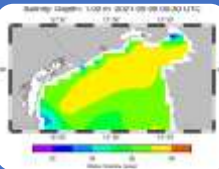
Different plots could be implemented:



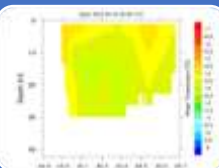
Constant latitude and longitude transects for Temperature



Constant latitude transect for Salinity (or currents)



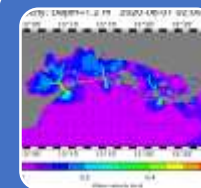
Constant level contour for Temperature or Salinity



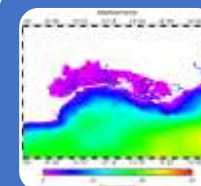
Transect for Temperature (or Salinity and Current)



SHYFEM-High Resolution



Contour velocity on Grado-Marano lagoon




Bathymetry


CONTACT INFORMATION

Partner Name: **ENVIRONMENTAL PROTECTION AGENCY OF FRIULI VENEZIA GIULIA (ARPA FVG)**

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 alex.pividori@arpa.fvg.it

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 <http://www.arpa.fvg.it>