

# POLLUTION MONITORING INSTALLATIONS

<b>PROJECT:</b>	NAUTICAL TOURISM DEVELOPMENT AND PROMOTION OF REGIONAL PORTS with acronym "REGLPORTS", which is funded by the transnational cooperation Programme "Interreg IPA CBC Italy–Albania–Montenegro Programme" of the 2014-2020 Program Period»
<b>WP</b>	T2 Pilot Actions /Investments
<b>OUTPUT</b>	Output O.T2.3 POLLUTION MONITORING INSTALLATIONS

## Introduction

### The Interreg IPA CBC Italy-Albania-Montenegro Programme

The Interreg IPA CBC Italy-Albania-Montenegro Programme, co-funded by the European Union through the Instrument for Pre-Accession (IPA II), has a total budget of 92.707.558,00 euro (including 15% national co-financing). The Programme is managed by Puglia Region, which participates together with another Italian Region, Molise; Albania and Montenegro participate with the entire territory. The objective is to promote economic growth and to intensify cooperation in the low Adriatic area, by implementing joint actions between national and regional institutional and non-profit actors and by fostering smart, inclusive and sustainable development.

The overall Programme budget is EUR 92.707.555, with a Union Support of EUR 78.801.422. The financial allocation to the chosen thematic objectives reflects the estimated financial size of actions foreseen in each priority axis, the coherence with the funding priorities as in the EC Country Position Paper and in the EC Indicative Strategy Papers, the strategic choices of the Programme stakeholders, as well as the inputs provided by relevant partners within consultations. Additionally, not less than 50% of total amount of the financial resources shall be reserved for thematic calls and strategic projects.

The Program Priority Axis are:

- **PRIORITY AXIS 1. Strengthening the cross-border cooperation and competitiveness of SMEs.**
- **PRIORITY AXIS 2. Smart management of natural and cultural heritage for the exploitation of cross border sustainable tourism and territorial attractiveness.**
- **PRIORITY AXIS 3. Environment protection, risk management and low carbon strategy**
- **PRIORITY AXIS 4. Increasing cross border accessibility, promoting sustainable transport service and facilities and improving public infrastructures.**
- **PRIORITY AXIS 5. Technical Assistance.**

### The REGLPORTS Project

The Adriatic Sea is characterized by a unique coastal environment with significant potential for tourism development. However, this potential is not fully exploited, while tourist activities are mainly focused on a seasonal “sun, sea and sand” approach. Nevertheless, there are alternative forms of tourism which could prolong the tourist season, tap new markets and overall, provide the essential conditions for regional economic growth.

Nautical Tourism (NT) is a dynamically expanded form of tourism, consisting an industry of high added value with strong clientele growth tendencies in the Adriatic Sea. In general, NT is seasonal, however, if combined properly with other mild tourism activities it may be prolonged with profound positive impact to local economies. Despite its high potential, NT is not sufficiently developed in the intervention area and its connection with the assets of the hinterland is insufficient.

Hence, the overall objective of the REGLPORTS Project is to develop a common model for the smart and sustainable NT management through integrated development plans. More specifically, the Project aims to provide a holistic approach by (a) connecting the coastal areas with the rich inland’s assets, (b) emerging and promoting the interconnected areas (Area Brand, Thematic Routes), and (c) upgrading tourism supporting services and products.

The envisaged plan will constitute an innovative approach in tourism industry, and increase tourism population, regional economic growth and therefore contribute significantly to the accomplishment of Program’s result indicators. The anticipated impact will substantially benefit stakeholders in the intervention area, including local communities, national and/or regional organizations and tourism related businesses.

The Partners participating in the Project are:

- **National Coastline Agency (LP) - AL**
- **Municipality of Molfetta – IT**
- **Municipality of Termoli - IT**
- **Union of the Provinces of Puglia - IT**
- **Ministry of Tourism and Environment of Albania – AL**
- **Agency for the management of the town harbor Herceg Novi Ltd. – ME**

The Associated Partners of the Project are:

- **Municipality of Vlora – AL**
- **Region of Molise – IT**
- **Municipality of Herceg Novi –ME**
- **Tourism Agency of Manfredonia – IT.**



### REGLPORTS – REPORT ON METEOROLOGICAL STATION – MUNICIPALITY OF TERMOLI

**Object:** Installation and activation of a meteorological station on the Molise coast as part of the REGLPORTS project.

On the 25<sup>TH</sup> of November 2021 at the Termoli's PRC tide station, Port street, Termoli's port, Termoli, CB, 86039, at 42°00' 12,00'' N and longitude 15° 00' 11,10'' E, 2 m on sea level, were carried out the installation works of the meteorological station.

The main installations regarded:

- the data logger compact plus
- a support steel pole (height of 10 meters)
- sensors support steel structures
- steel container with armor strip, 100 W solar cell and 100 mAh buffer battery
- PG10 rain gauge with support pole and protective fence
- a pyranometer and a GRPS/UMTS communication module.

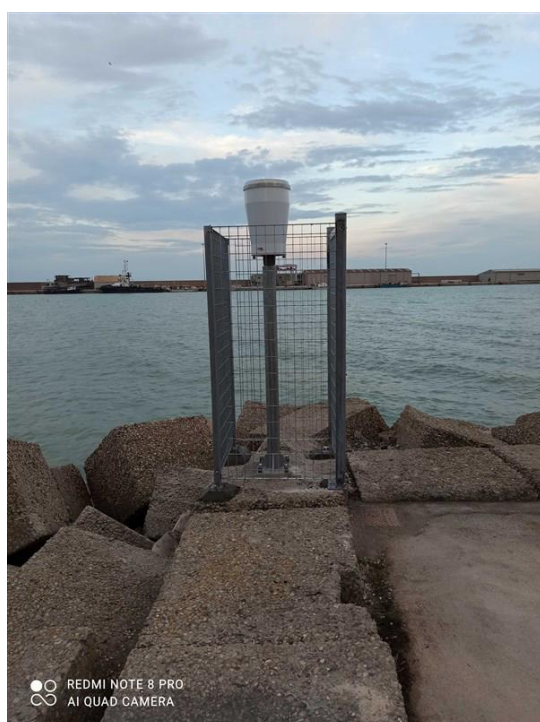
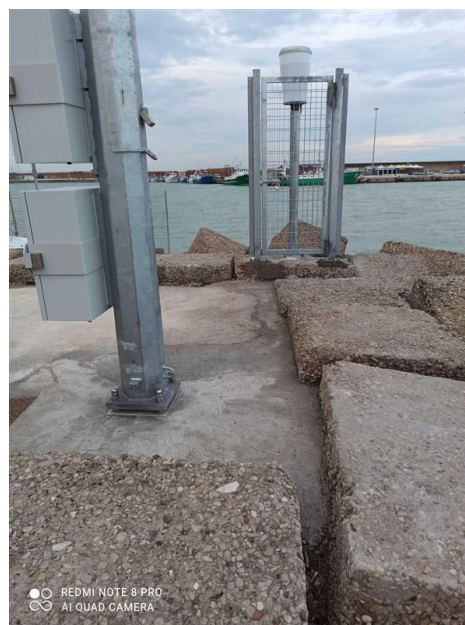
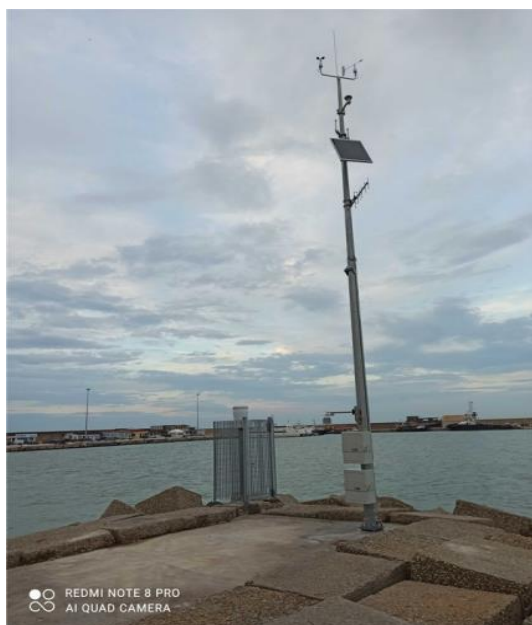
Proper operation of the monitoring station has been verified through connection with the CAE control unit. The station data are correctly sent and acquired.

# Interreg - IPA CBC

Italy - Albania - Montenegro



REGLPORTS



## **AGENCY FOR MANAGEMENT OF PORT HERCEG NOVI – MONTENEGRO**

**Object:** Herceg Novi port monitoring through a meteorological station and video surveillance equipment.

A meteorological station was acquired and installed which data is regularly updated and is available to sailors and to all visitors to the port. The weather station has its own power source which is recharged via a solar panel during the day, so it is energy efficient. The measurement parameters, available through the I-O port terminal, or through "cloud" access, or through the application are as follows:

- Air velocity
- Atmospheric pressure
- Carbon dioxide
- Compressed air flow
- Light intensity
- Precipitation
- Relative Humidity
- Soil Humidity
- Temperature
- Volatile Organic Composition
- Water Flow
- Water Level and Wind.

The purchase and installation of sensors that will measure certain parameters of sea water (level of acidity or alkalinity (pH), salinity, oxygen, temperature, turbidity) is foreseen through one of the three key activities of the SEAVIEWS project (SEctor Adaptive VIRTUAL Early Warning System for marine pollution) funded under the Interreg VA ADRION Program which aims at promoting and enhancing the capacity of transnational collaborations tackling environmental vulnerability, fragmentation and the safeguarding of ecosystem services in the wider Adriatic area. The SEAVIEWS project will bring together stakeholders from 6 partner states; namely Greece, Albania, Croatia, Montenegro, Italy and Slovenia.

As for the video surveillance equipment of the City Port, which will affect the entire port area, in addition to the pedestrian perimeter, it is composed of:

- n°12 Avigilon video analytics 5mpix IP cameras
- n°1 Avigilon Advanced VCR with 16TB capacity and analysis. The video recorder has the possibility of expansion, as well as the entire system, and in the future, it will allow coverage of the entire promenade in the city port.
- n°1 monitoring station
- n°2 supervision monitors
- n°1 Network equipment, POE switches, video signal transmission antennas, UPS system, rack cabinet, patch panel, optical cables, etc.



The advanced video surveillance system with video analysis, in addition to the mandatory standard option of video surveillance and recording system, also allows the monitoring and detection of accidents in the aquatic area of the port, the detection of unauthorized boats and vehicles in the perimeter, checking covid measurements - measuring the distance between people in the port, as well as whether people are wearing the mask.



## Concept of solution

The Port Monitoring System consists of:

- **Collection of data from water, air and climate parameters sensors air and climate parameters sensors**
- **Receiving data in JSON format**
- **Sending this data to the database**
- **Display data in tabular or graphical form for users.**

## Relevant background information

The Adriatic Sea is characterized by a unique coastal environment with significant potential for tourism development. However, this potential is not fully exploited, while tourist activities are mainly focused on a seasonal “sun, sea and sand” approach. Nevertheless, there are alternative forms of tourism which could prolong the tourist season, tap new markets and overall, provide the essential conditions for regional economic growth.

Nautical Tourism (NT) is a dynamically expanded form of tourism, consisting an industry of high added value with strong clientele growth tendencies in the Adriatic Sea. In general, NT is seasonal, however, if combined properly with other mild tourism activities it may be prolonged with profound positive impact to local economies. Despite its high potential, NT is not sufficiently developed in the intervention area and its connection with the assets of the hinterland is insufficient. Hence, the overall objective of the Project is to develop a common model for the smart and sustainable NT management through integrated development plans. REGLPORTS aims to provide a holistic approach by (a) connecting the coastal areas with the rich inland’s assets, (b) emerging and promoting the interconnected areas (Area Brand, Thematic Routes), and (c) upgrading tourism supporting services and products.

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The envisaged plan will constitute an innovative approach in tourism industry, which cannot be successfully tackled by individual national strategies. The Project will increase tourism population, regional economic growth and therefore contribute significantly to the accomplishment of Programme's result indicators. REGLPORTS foresees to facilitate the sustainable NT management, considering as a top priority the environmental sustainability.

The anticipated impact will substantially benefit stakeholders in the intervention area, including local communities, national and/or regional organizations and tourism related businesses. Creation of networking among cultural and historical heritage and natural landscapes.

## Overall objective

The overall objective of the Project is the development of common models and plans for the enhancement of NT in the intervention area. The envisaged plans, are expected to improve smart and sustainable economic development and significantly boost the attractiveness of natural and cultural assets which are related to REGLPORTS ports; hence directly impacting the fulfilment of Programme's Specific Objective.

Within this in mind, the main objectives include:

1. the capitalization of inland's natural and cultural assets which could lead to diversified tourism products and services
2. the preservation of environmental sustainability and,
3. the effective use of smart ICT tools that will substantially upgrade the existing tourism facilities and services.

The main expected Outputs include:

- a) operational CBC nautical tourism development plan

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b) pollution monitoring installations

c) operational platform with common tourism services

d) reglports centers established

e) tools for tourism skills upgrading Overall, the main expected results are envisaged to facilitate smart and sustainable tourism management, thus increase tourism population, boost financial growth and reduce unemployment at local/regional scale.

The above results will be achieved without jeopardizing environmental sustainability; hence, preservation of natural resources and environmental protection of natural habitats is a key prerequisite for the Project's success and one of the main expected results. In addition, REGLPORTS foresees to increase the use of ICT technologies and enhance the "low-tech" profile of the CB region, support the intervention area in successfully competing with other Mediterranean tourist destinations and, ultimately interconnect coastal with inland areas and fully valorise their unexploited potential.

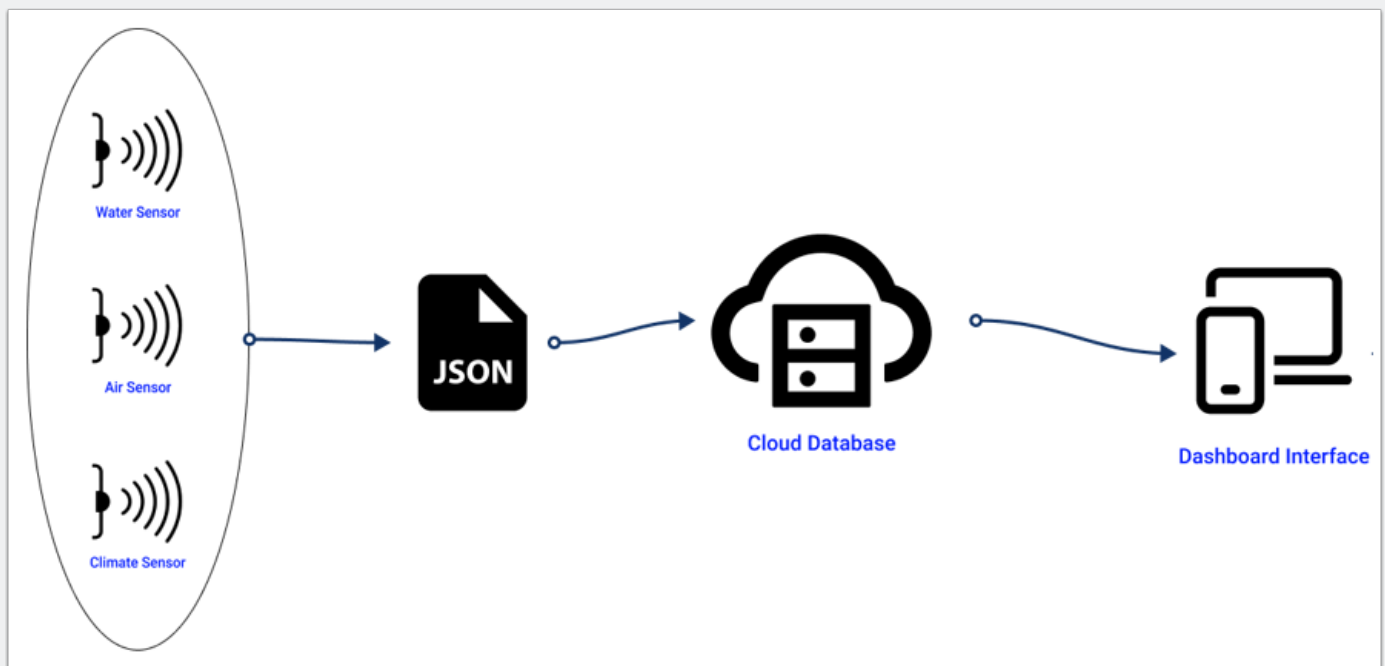
The aim of the assignment is the development of PMS (as sub-system of the web-portal or stand-alone), including real data processing, monitoring and alert flagging, definition of trends, etc..

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## Implemented Functions

Port Monitoring System realizes the creation of databases for the data that will come from the sensors of water quality, air and climate parameters.

PMS will have a panel, where it will show in tabular or graphical form the data on water quality, air quality parameters and climate parameters. This will be done by taking data from the relevant sensors and displaying this data in the program panel.



## UI/UX Design Process

When it comes to product design, theory and practice are two very different things. We all know basic tenets of user-centered design. We recognize different research methods,

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the prototyping stage, as well as the process of documenting techniques in our rich methodological environments.

1. During the initial phase of product definition, we brainstormed the product and how to execute on the project at the highest level with all necessary stakeholders. This might result in project kickoff plan, a lean canvas, and a bunch of really early concept maps and mockups of what we're looking to build.
2. Moving into research, we refine assumptions and fill in the blanks. This stage varies based on complexity of the product, timing, resources, level of existing knowledge, and many other factors. In general, however, it's good to build out competitive and market analyses and conduct customer surveys. If you have an existing product, reviewing analytics, content, product context, and user tests are also quite helpful.
3. In analysis, the product marketing data collected so far provides the foundation for personas, experience maps, and requirements documents such as prioritized feature spreadsheets and user-task matrices. At this point, the product definition, product priorities, and product plan has been defined and are ready for more formal design deliverables. Sketches and diagrams are also likely constantly being generated throughout this time.
4. From this output, scenarios, concept maps, and mockups may be created, leading into the design phase. This includes sketches, wireframes, prototypes, task-flow diagrams, and design specifications.
5. During implementation, code and design assets are assembled to create a product that follows the product design specifications.

## Technology used

- HTML: The layout of the pages is designed in HTML
- Tailwind CSS: Tailwind CSS is used for the whole part of the module design
- VueJS: The validity of the inputs was developed in VueJS
- Laravel: All business logic is implemented in Laravel
- MySQL: The MySQL database is used as the database for the module

## Getting and sharing sensor data by an API. Vue + Axios - HTTP GET Request

Port Monitoring System platform is a SPA (Single Page Application). When working with SPA's it is very common to fetch data from remote services. This allows for dynamic content to be displayed depending on certain applied criteria. Fetching of said data can be done in many ways, some of which are described below.

### Using Axios to consume APIs

**Axios** is a promise-based HTTP client which makes it suitable for fetching data during server-side display. It works on both browser and Node apps. Axios is a library that is built around the Fetch API.

### Axios Installation

To use Axios, we installed it. This can be done in two ways:

- By using *npm*; a standard package manager for the JavaScript runtime environment Node.js.
- By using *yarn*; a package manager that also acts as a project manager. It is synergetic with the npm registry and has the same features.

### Populating Data with a GET Request

Now, we'll make our first API request using the *GET* method. A *GET* method is used to fetch data from an API. We want this API request running asynchronously therefore, we use a promise-based function with the keywords *async/await*.

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You may wonder why we used a promise-based function. This is because a promise is a stand-in for a value not necessarily known when the promise is created. Since API requests take an undeterminable amount of time, we use promises.

We also need to test for errors using the try/catch method. *try* is used to check for errors while *catch* is used to handle the error if one occurs.

This code below will retrieve "data" from JSONPlaceholder and populate an unordered list with the "data". Any "errors" encountered will appear in a separate unordered list.

Next, we will use `axios.data()` to make a POST request.



## Pushing Data with a POST Request

You used Axios to send POST, PUT, PATCH, and DELETE requests.

```
1 <template>
2   <div>
3     <input type="text" v-model="postBody" @change="postPost()" />
4     <ul v-if="errors && errors.length">
5       <li v-for="error of errors">
6         {{error.message}}
7       </li>
8     </ul>
9   </div>
10 </template>
11
12 <script>
13 import axios from 'axios';
14
15 export default {
16   data() {
17     return {
18       postBody: '',
19       errors: []
20     }
21   },
22
23   methods: {
24     // Pushes posts to the server when called.
25     postPost() {
26       axios.post(`http://jsonplaceholder.typicode.com/posts`, {
27         body: this.postBody
28       })
29       .then(response => {})
30       .catch(e => {
31         this.errors.push(e)
32       })
33     }
34   }
35 }
36 </script>
```

## Creating a Common Base Instance

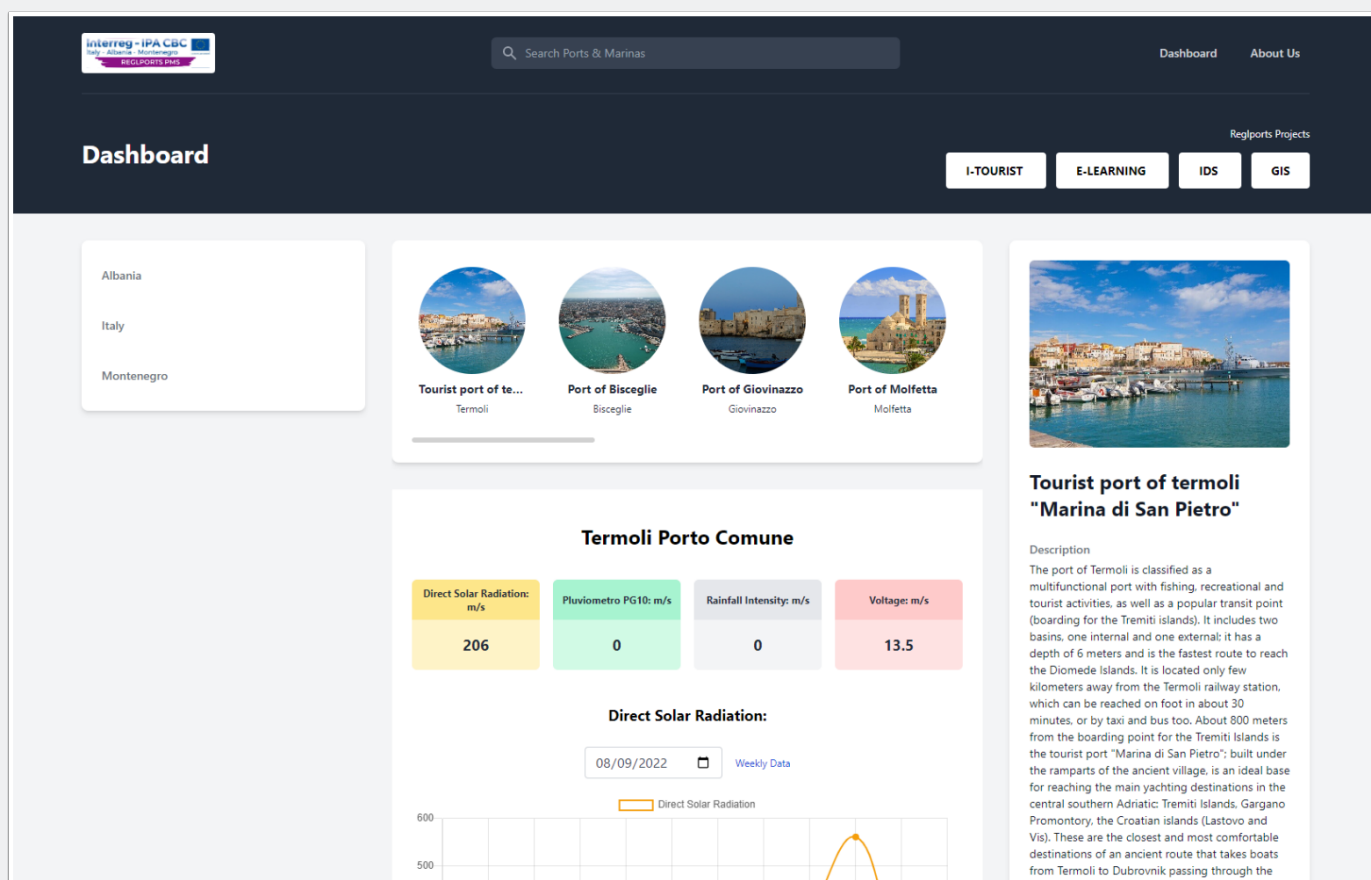
A frequently overlooked but very useful capability Axios provides is the ability to create a base instance that allows you to share a common base URL and configuration across all calls to the instance. This comes in handy if all of your calls are to a particular server or need to share headers, such as an Authorization header:

```
1 import axios from 'axios';
2
3 export const HTTP = axios.create({
4   baseURL: `http://jsonplaceholder.typicode.com/`,
5   headers: {
6     Authorization: 'Bearer {token}'
7   }
8 })
```

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## Dashboard Page Preview

The user can see the first page "Dashboard". On Dashboard are listed all ports from different countries, Albania, Italy and Montenegro. Ports have a description, facilities and contacts

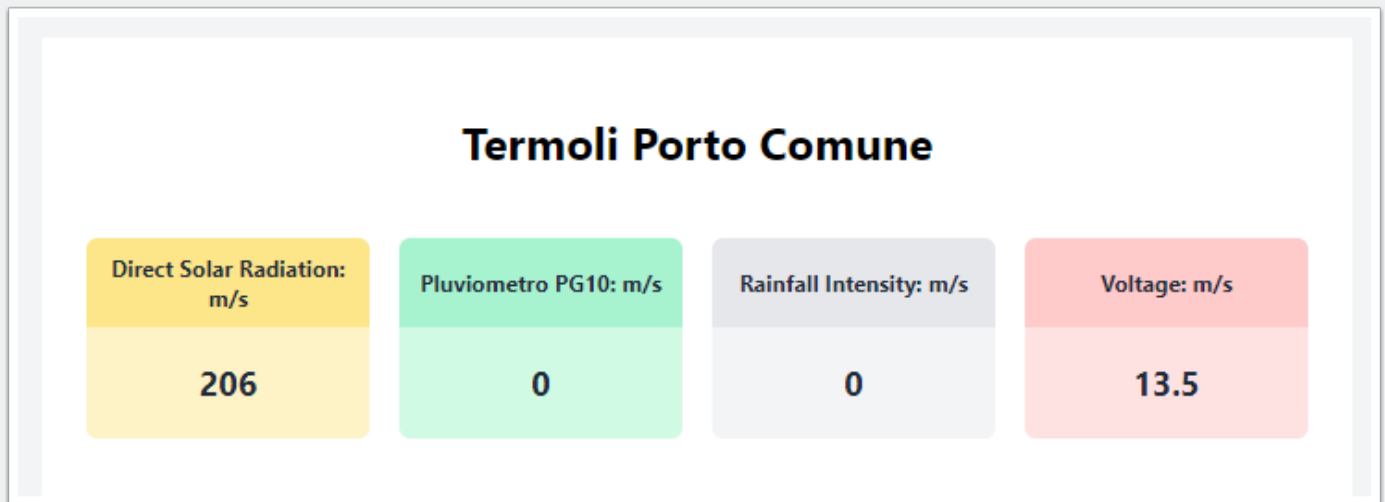


## Termoli Port Comune

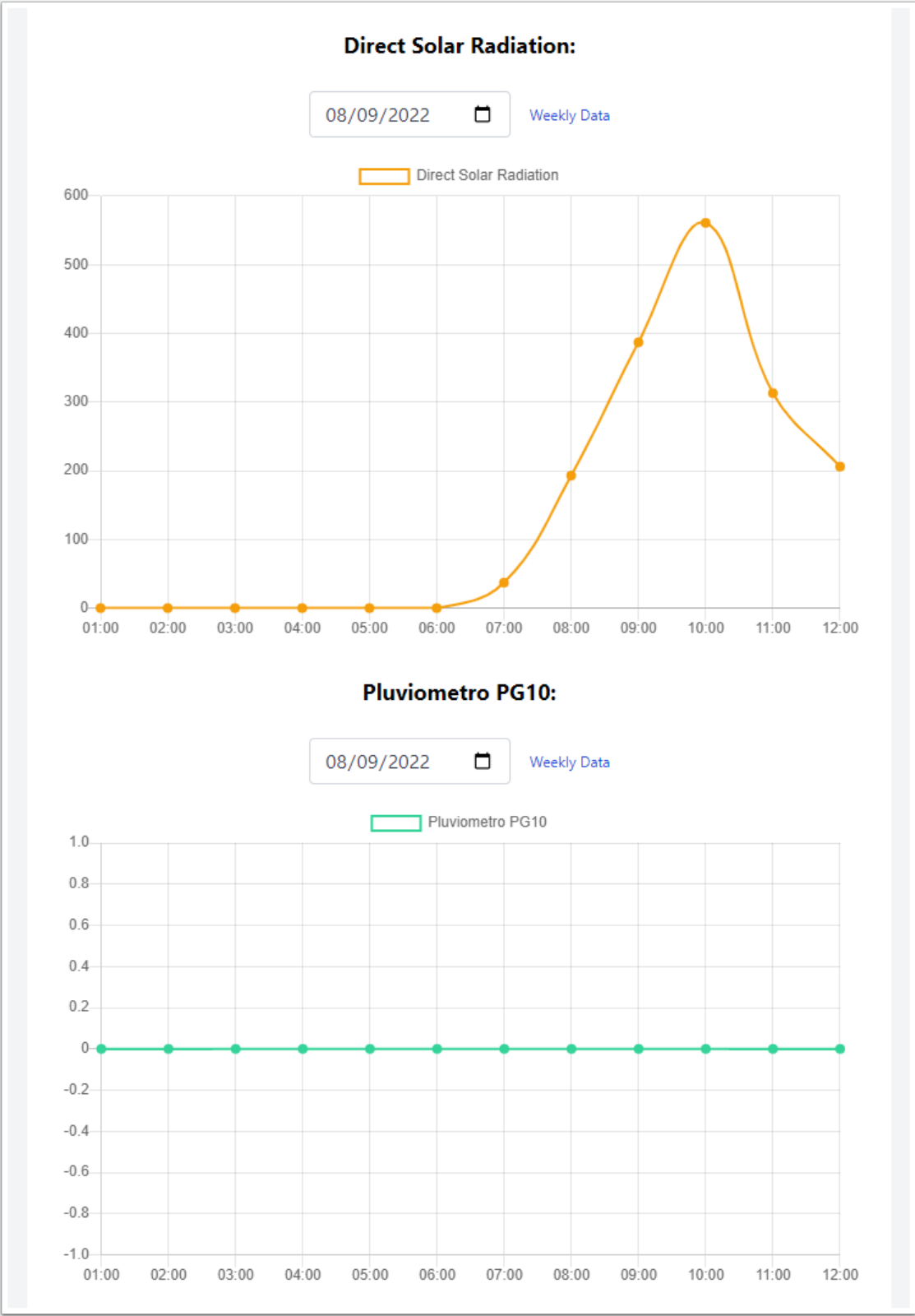
This is the section where water quality parameters are shown, statistics type of information and graphic type of information. (The informations depends of the type of

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Sensors). This Sensor shows Direct Solar Radiation, Pluviometro, Rainfall Intensity and Voltage Parameters. You can switch from daily to weekly filter data.



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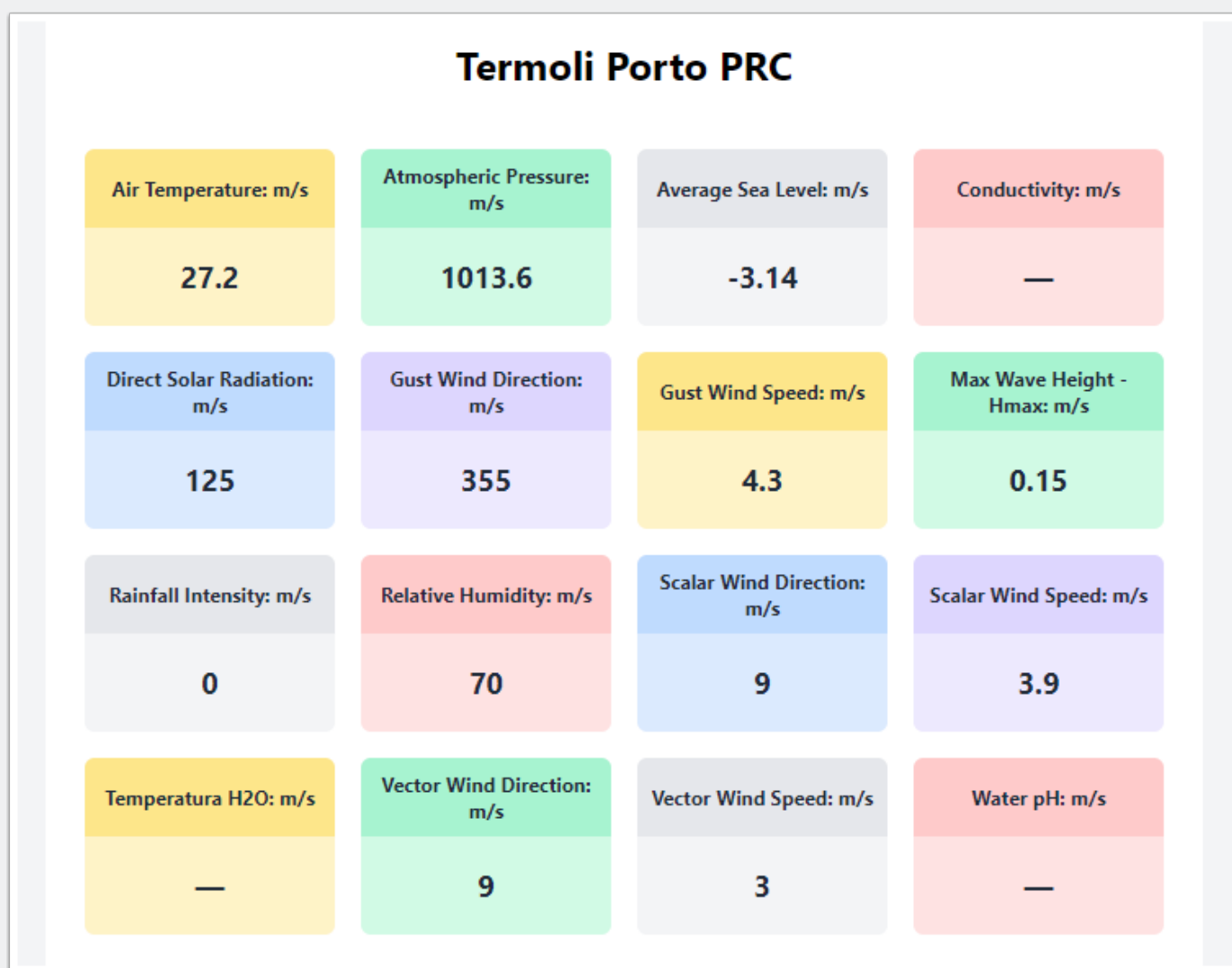
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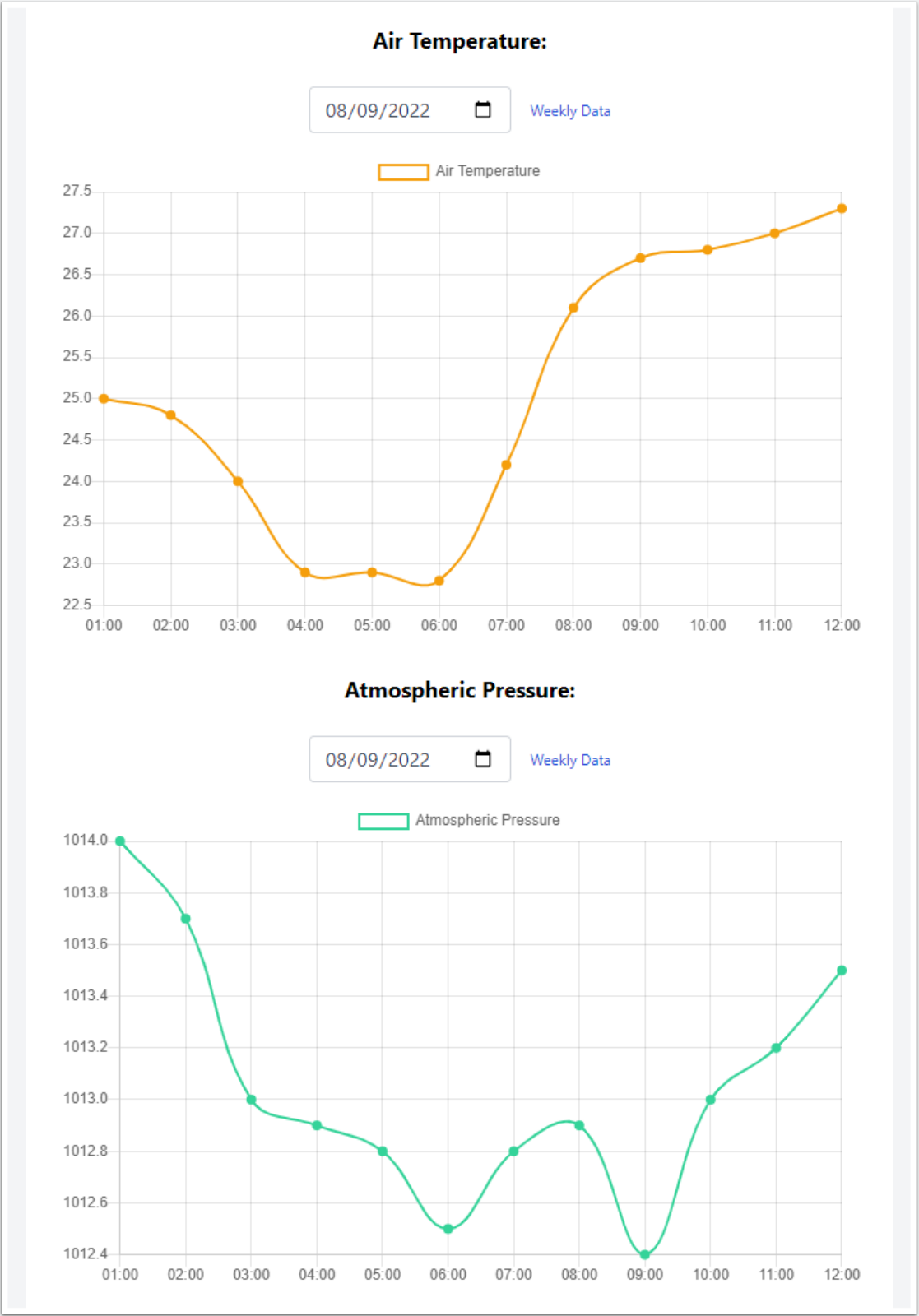
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## Termoli Porto PRC

This is the section where water quality parameters are shown, statistics type of information and graphic type of information. (The informations depends of the type of Sensors). This Sensor shows Air Temperature, Atmospheric Pressure, Average Sea Level, Direct Solar Radiation, Gust Wind Direction Parameters... You can switch from daily to weekly filter data.

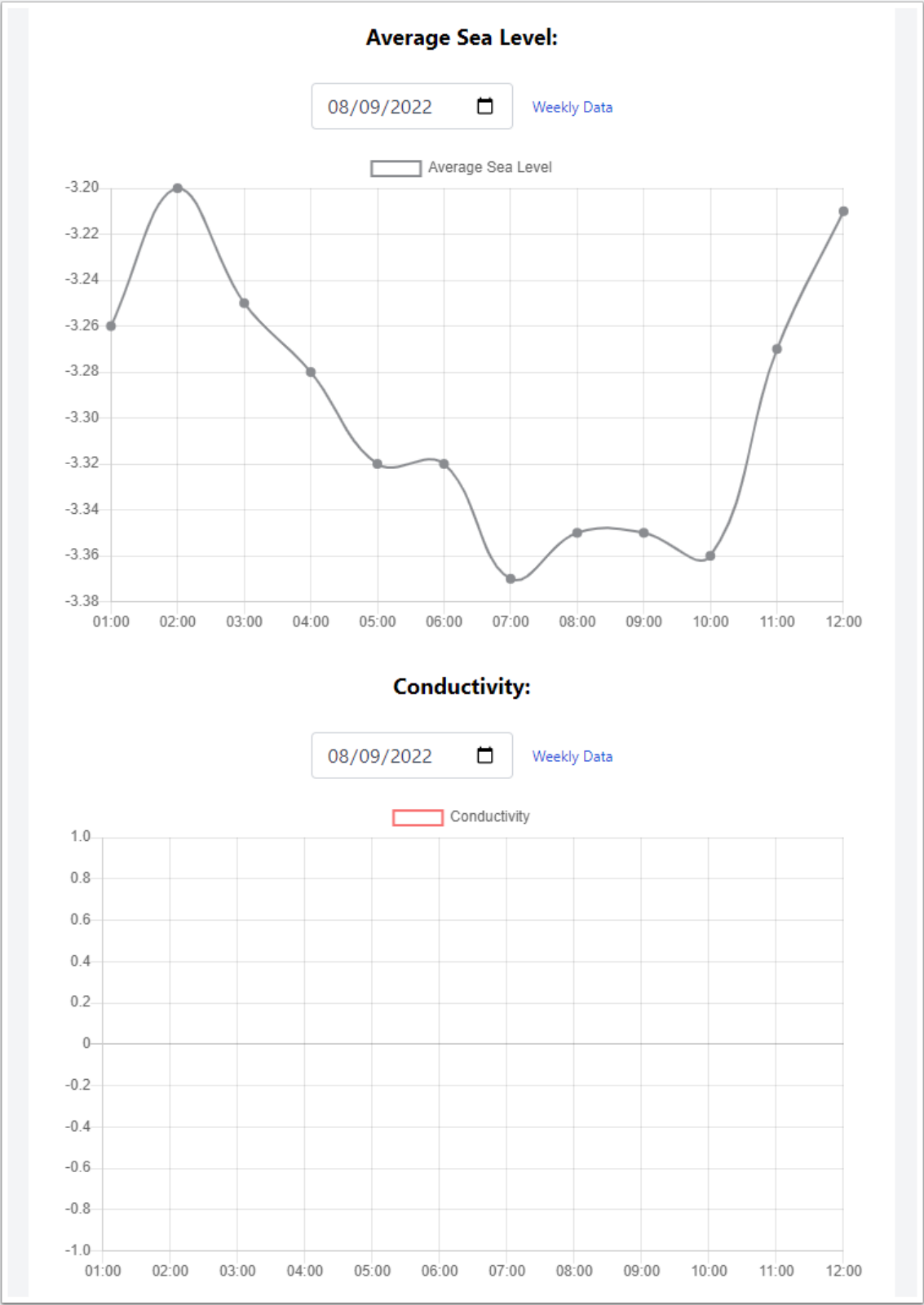


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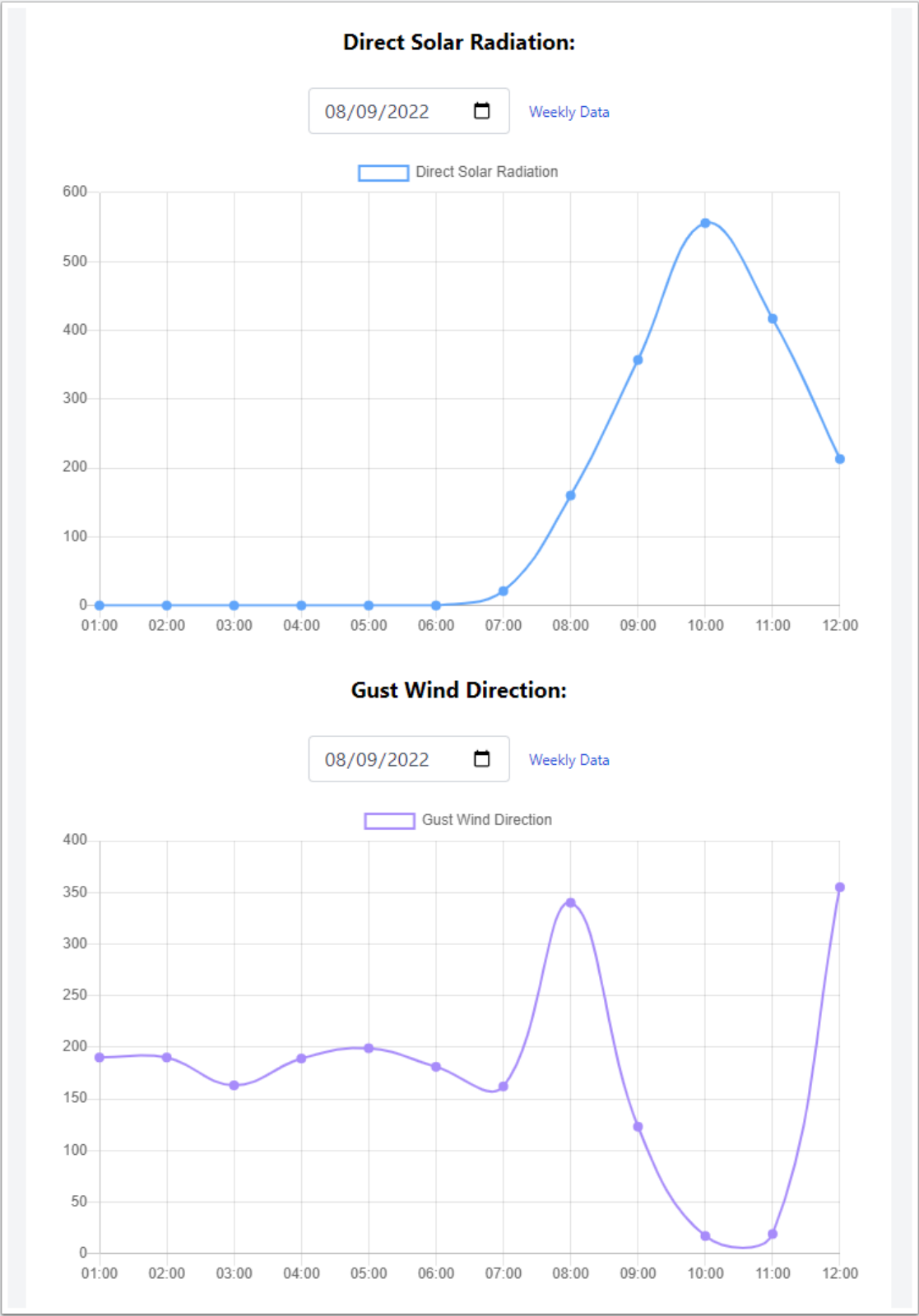




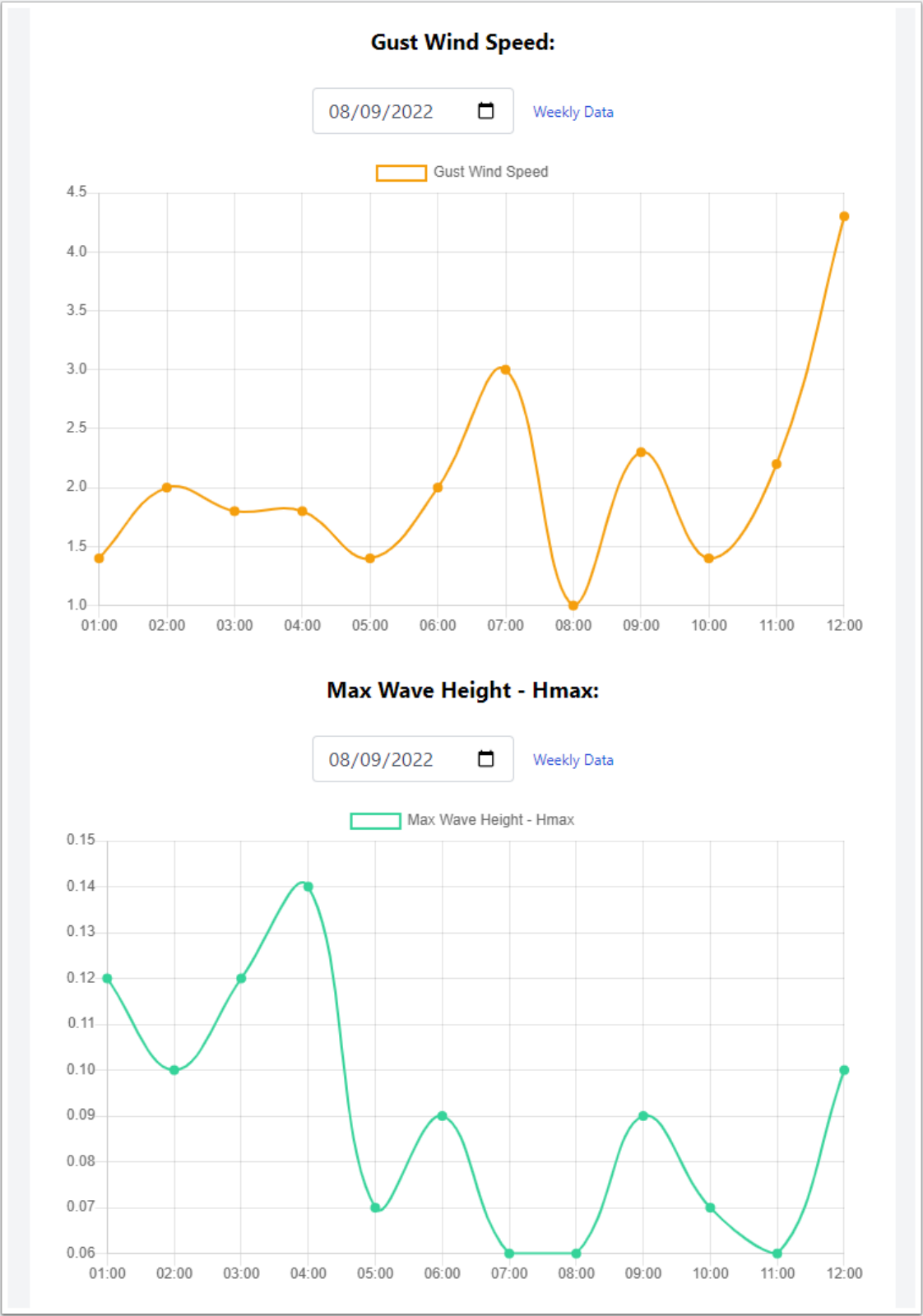
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### Max Wave Height - Hmax:

08/09/2022

[Weekly Data](#)

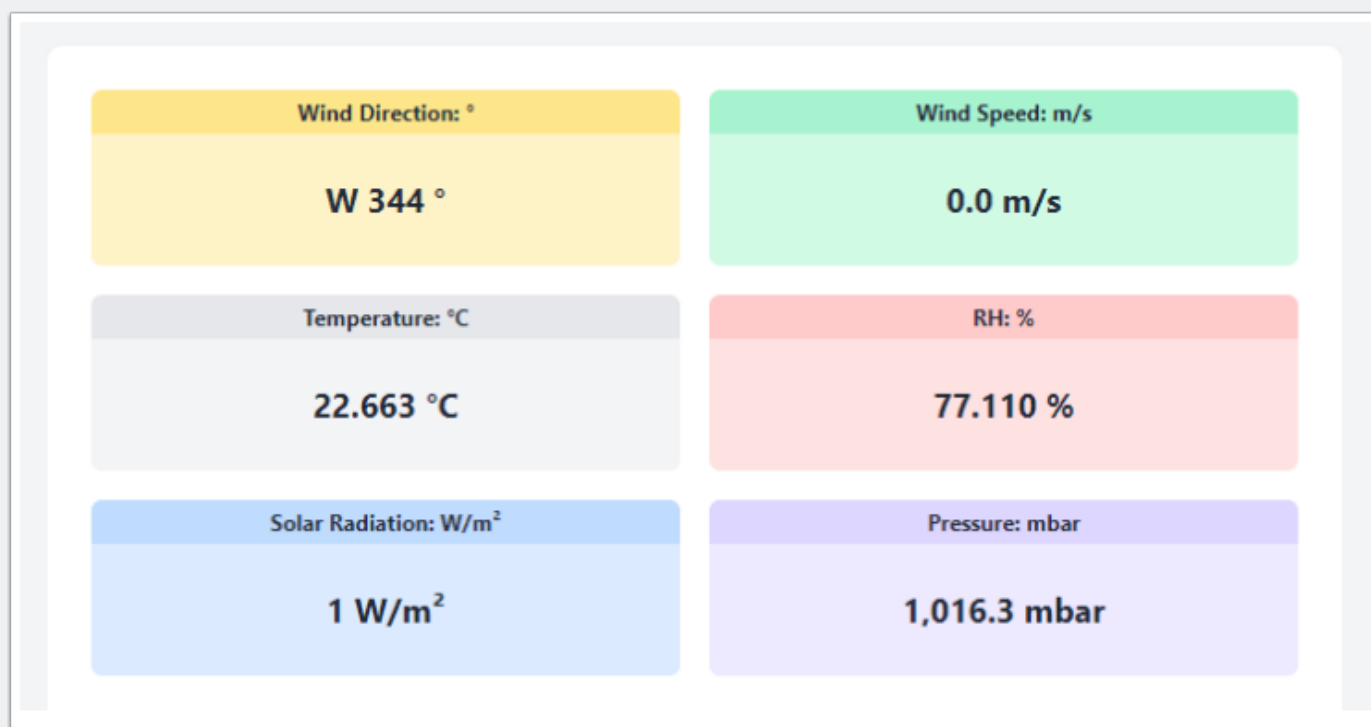
Max Wave Height - Hmax

Time	Max Wave Height - Hmax
01:00	0.12
02:00	0.10
03:00	0.12
04:00	0.14
05:00	0.07
06:00	0.09
07:00	0.06
08:00	0.06
09:00	0.09
10:00	0.07
11:00	0.06
12:00	0.10

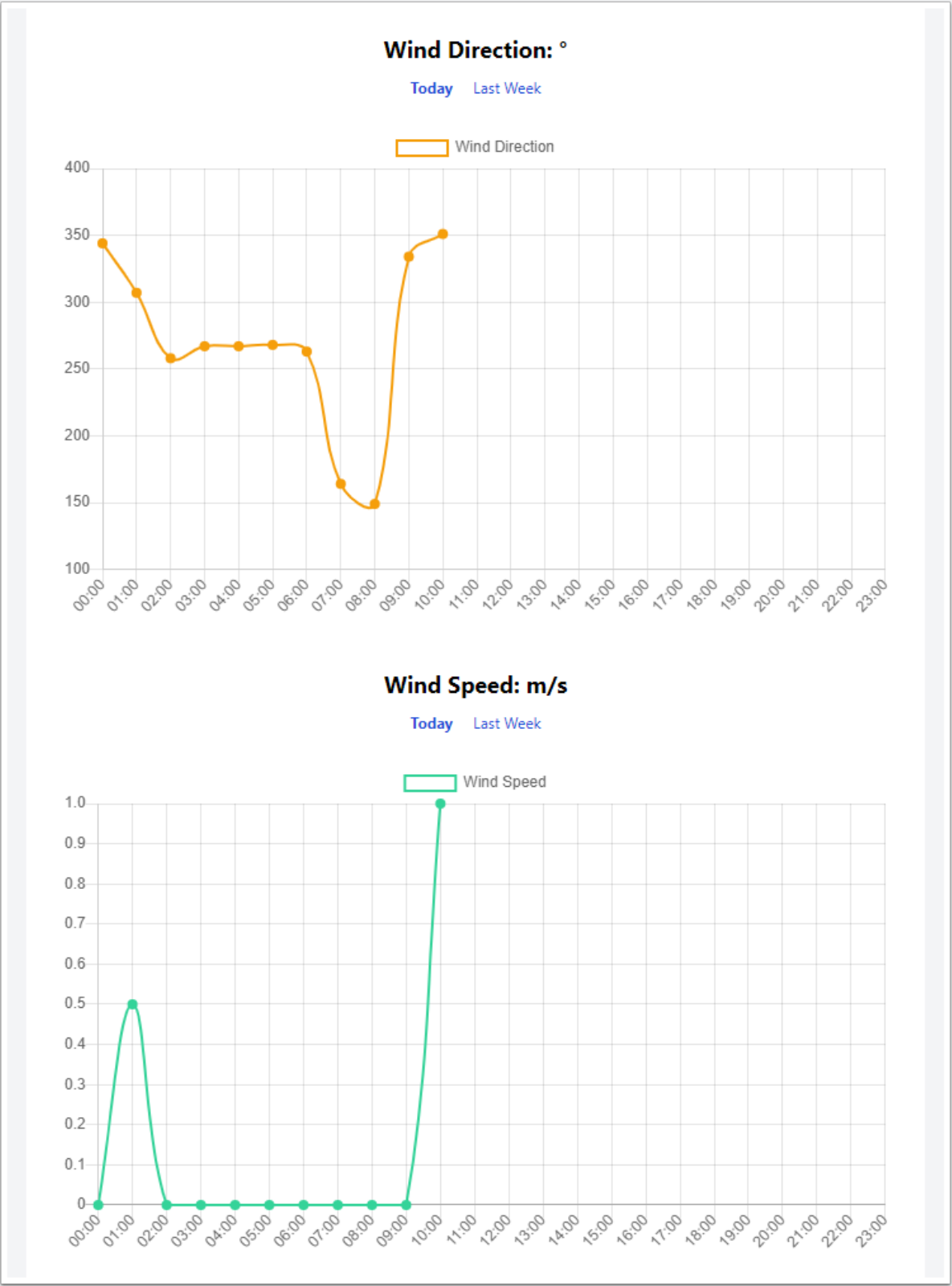
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## Herceg Novi Port

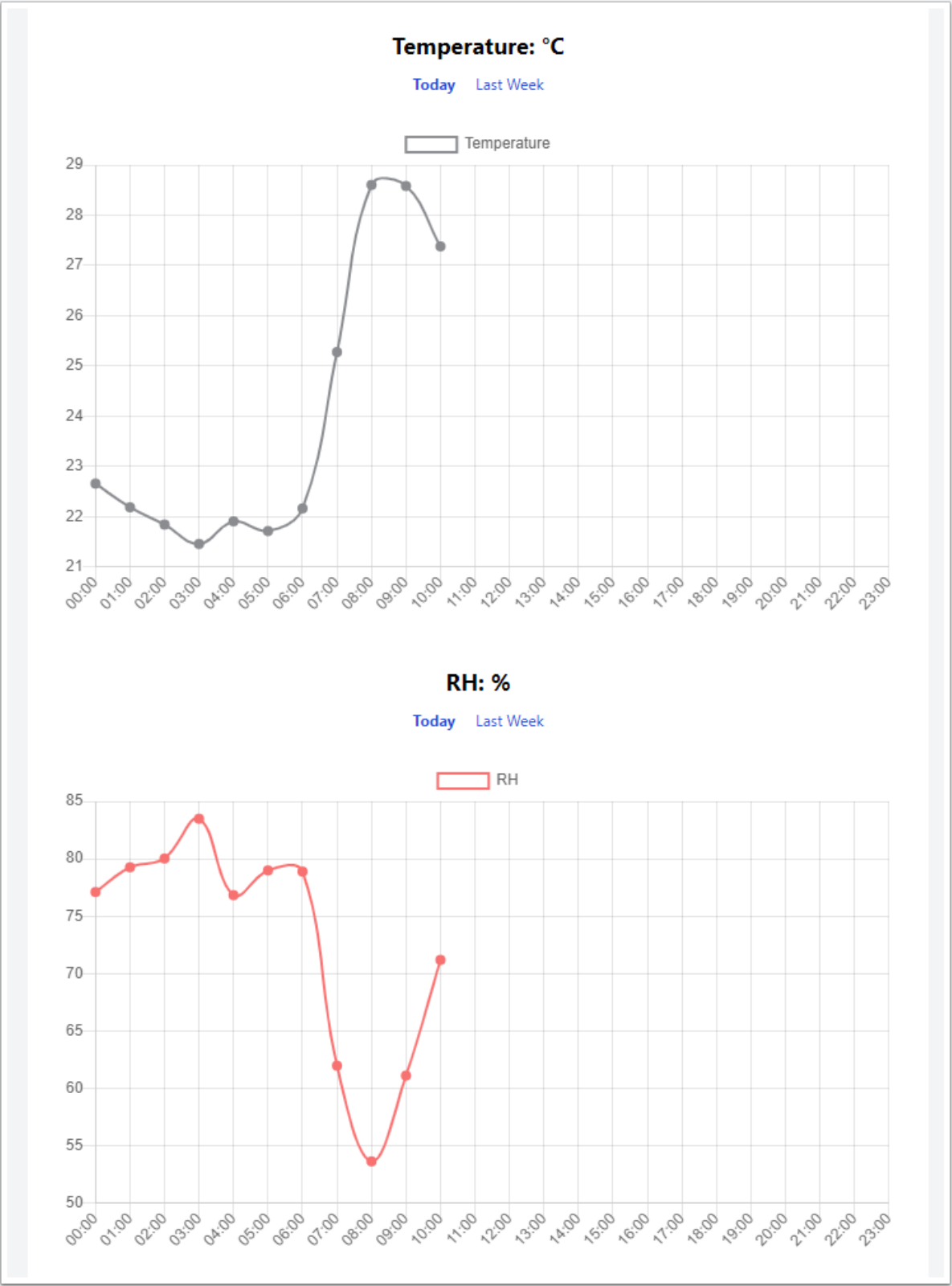
This is the section where water quality parameters are shown, statistics type of information and graphic type of information. (The informations depends of the type of Sensors). This Sensor shows Wind Direction, Wind Speed, Temperature, RH, Solar Radiation and Pressure Parameters... You can switch from daily to last week filter data.



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