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National Tide Gauge Network and the Importance of Accurate Data for Nautical Navigation

May 2024



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- ◇ National Tide Gauge Network (NTGN).
- ◇ Importance of Accurate Tide Data.
- ◇ Tide Gauge Data Collection and Processing.
- ◇ Applications of Tide Data.



National Tide Gauge Network (NTGN)



National Tide Gauge Network (NTGN)

- ◇ Overview of the National Tide Gauge Network (NTGN).
- ◇ Purpose of Tide Gauges.

Overview of the National Tide Gauge Network (NTGN)





Purpose of Tide Gauges

- ◇ For safe and efficient navigation through Coastal Waters.
- ◇ Coastal development and engineering.
- ◇ Long-term sea level assessments.
- ◇ Reduction of bathymetric soundings.
- ◇ Determination of Baseline, which is a reference for Maritime Boundaries.



Importance of Accurate Tide Data

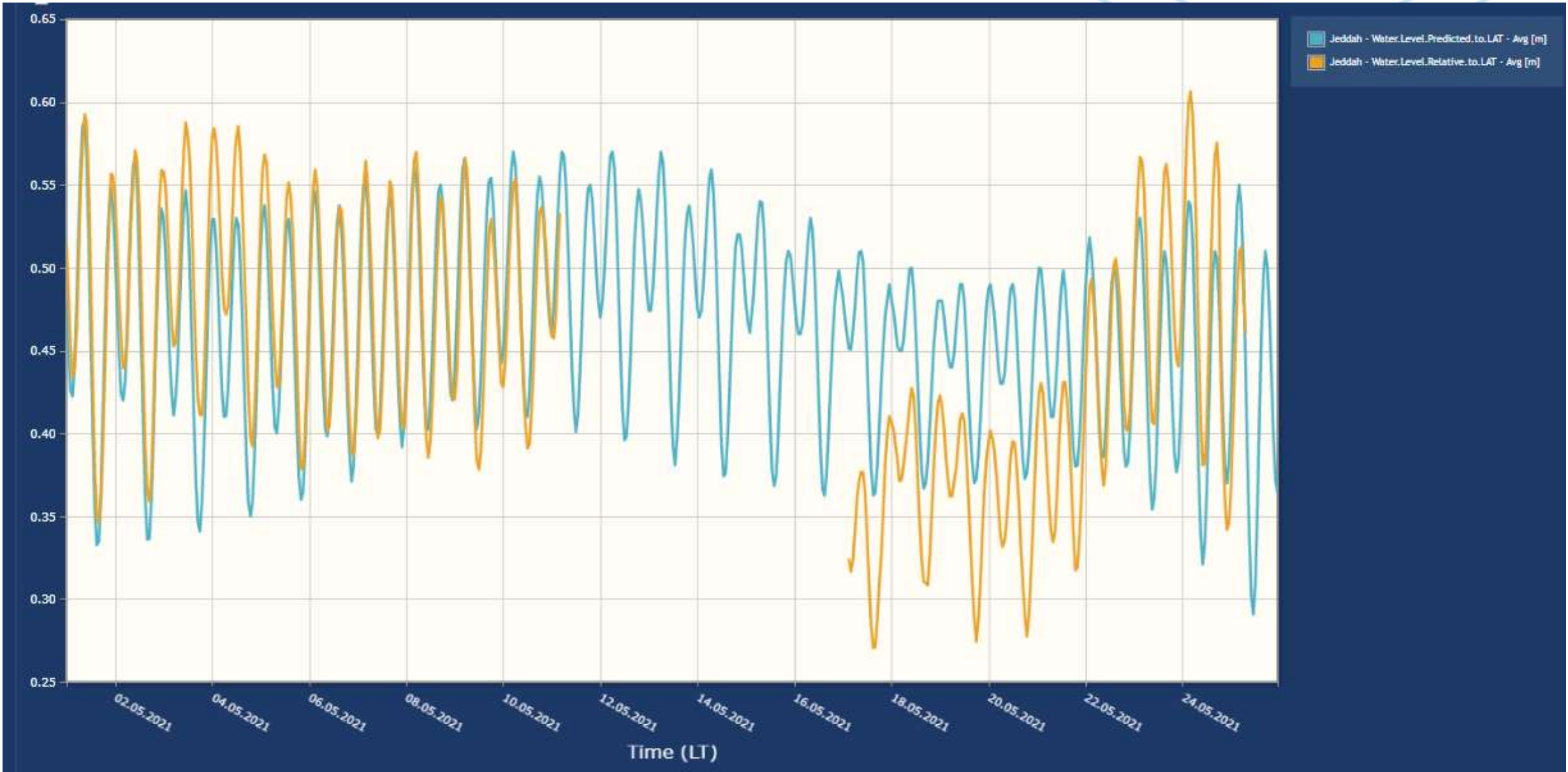


Importance of Accurate Tide Data

- ◇ How accurate tide data can impact nautical navigation.
- ◇ Importance of continuous and reliable tide data.



How Accurate Tide Data Can Impact Nautical Navigation



Importance of Continuous and Reliable Tide Data

- **Safety:** Continuous and reliable tide data is critical for ensuring the safety of ships, boats, and other vessels navigating the waters. Accurate tide data allows mariners to plan their routes and avoid navigational hazards such as shallow areas, underwater obstructions, and strong currents.
- **Efficiency:** Reliable tide data allows mariners to optimize their routes and reduce fuel consumption, which can lead to cost savings and environmental benefits. For example, mariners can take advantage of favourable tidal currents to reduce travel time and fuel consumption.
- **Planning and management:** Continuous and reliable tide data is essential for coastal management and planning decisions. Tide data can inform coastal development, erosion control, and flood protection decisions.
- **Research:** Continuous and reliable tide data is critical for research related to climate change and sea level rise. Tide data provide long-term records of sea level changes, which can help researchers understand and predict the impacts of these phenomena on coastal communities and ecosystems.
- **Economic benefits:** Reliable tide data can support a variety of economic activities, such as commercial fishing, shipping, and tourism. Accurate tide data allows these industries to operate more safely and efficiently, which can lead to economic benefits for coastal communities.



Tide Gauge Data Collection and Processing



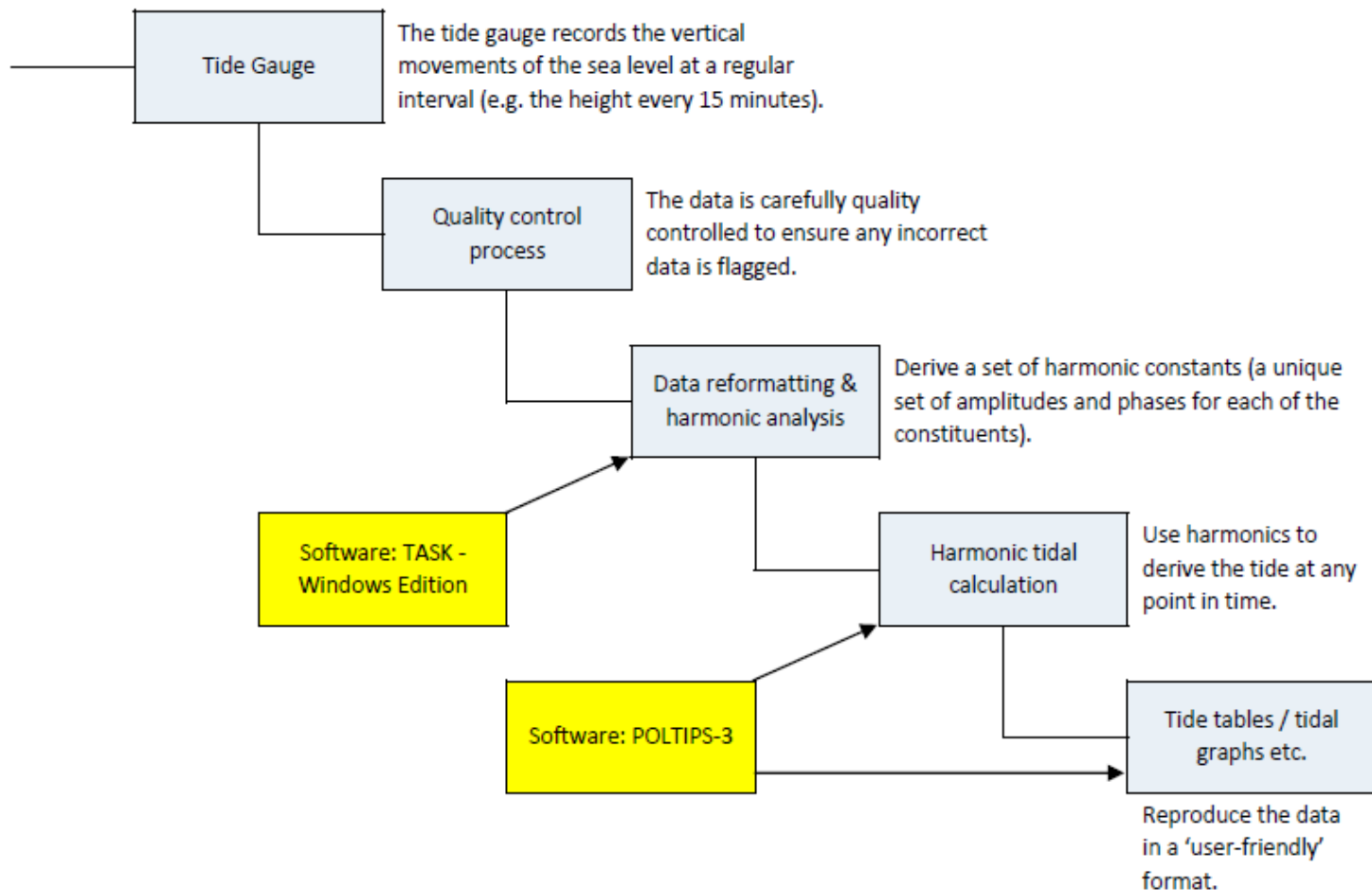
Tide Gauge Data Collection and Processing

- ◇ Tide data processing and quality control.
- ◇ Factors affecting the accuracy of tide data.



Tide data processing and quality control

The complete process of deriving a tide table showing the tides at any date and time into the future starts with having a good quality record of the actual tidal levels observed over as long a period as possible (ideally 18.6 years).





Factors Affecting the Accuracy of Tide Data

- **Location and environment:** The tide gauge's location and environment can affect the data's accuracy. Tide gauges located in areas with high wave energy or strong currents may experience more measurement errors than gauges in calmer waters.
- **Instrumentation:** The quality of the instrumentation used to collect tide data can affect its accuracy. The sensors' type and calibration can impact the measurements' accuracy.
- **Data processing:** The methods used to process and analyse the tide data can affect its accuracy. Correcting for systematic errors such as sensor drift, atmospheric pressure changes, and temperature effects is critical to ensuring the accuracy of the data.
- **Changes in the surrounding environment:** Changes in the surrounding environment, such as coastal erosion, sea level rise, or changes in the shape of the seafloor, can affect the accuracy of tide data over time.



Applications of Tide Data





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