Multi-Dimensional data format enabling rapid assessment of wind resources anywhere in the world

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EERA DeepWind 2023

Our Challenge

...Taking a long time to retrieve the data you request

Traditional data formats inherit file structures ill-suited to cloud and web browser workflows…

Our Goal:
Wind AXIOM

Data and insights for every stage across the entire wind development project at your fingertips whenever you need it.

Complete

We aggregate data from multiple sources, refine it, make it comparable, and add high-quality insights

Convenient

Managing huge datasets is complicated and expensive; Wind AXIOM takes this burden; providing easy, secure and cost-effective access.

Fast

Using multi-dimensional cloud optimised data principles we ensure data access Wind Axiom is lightning fast. It's also in once place- reducing practical lead times between questions and answers.

Connected

Export time series and wind resource grids (.wrg) from open source or TGS wind models. Connect to flexible and performant APIs. Share insights with colleagues.

See the energy at
TGS.com

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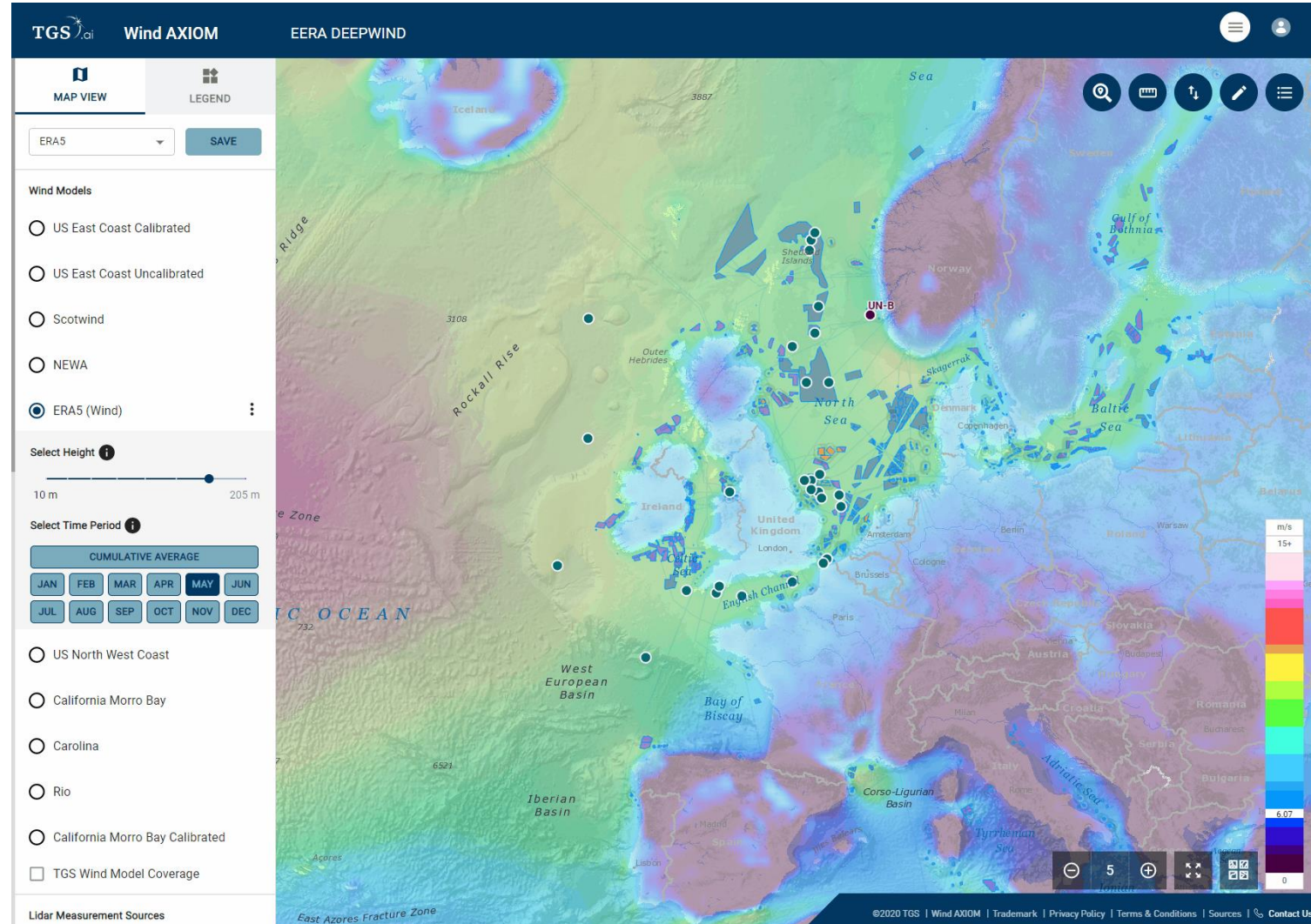
Our Experience

Management, Manipulation and processing of TB size seismic volumes and subsurface data volumes in cloud environments.

Traditional standards

Seismic data format standards based on decades old seg-y / seg-d formats
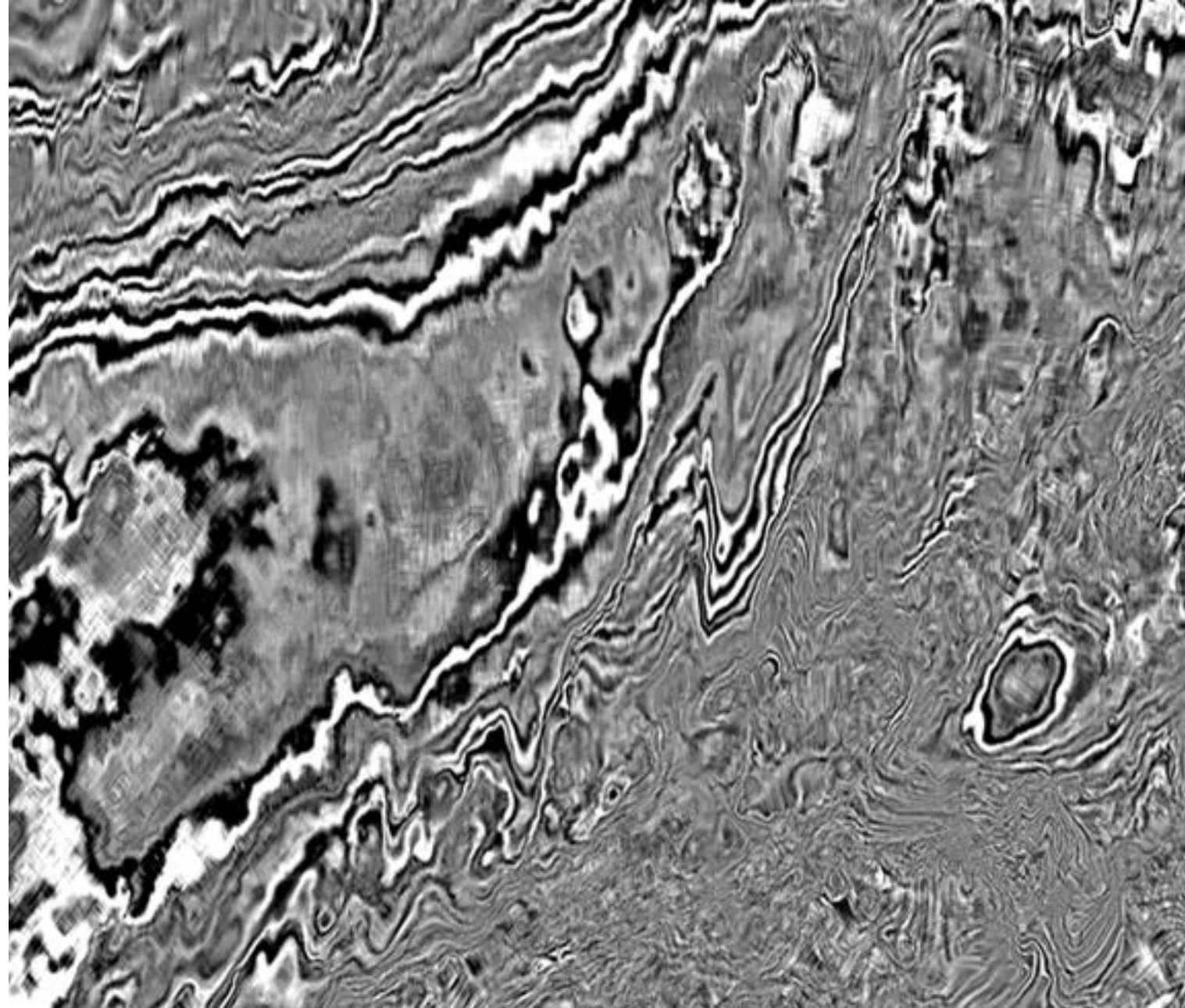
Cloud Processing

Seismic data processing performed off prem requires efficient data storage

Analytics workflows

Modern analytical and machine learning processes can operate faster and more reliably with optimised data

Web Visualisation

Visualisation tasks previously only available with offline software now possible in browser

TGS

Our Solution: MDI-O

MDIO is a library to work with large multidimensional energy datasets.

Cloud-native, chunked and compressed

Significant reduction in cloud storage and processing costs

Easier to process spatially adjacent information

Fast random access, de-coupled metadata

Reduced data sizes

Easy to add other compression schemes

Optimization ready for web visualization or scientific computing

Optimized for distributed computing and ML

Support for massively parallel compute through open source software ecosystem

Ideal for patch extraction for deep learning

Seismic/ Wind Resources ready

Optimised for multidimensional data including Wind Model / NWP data, seismic data and more

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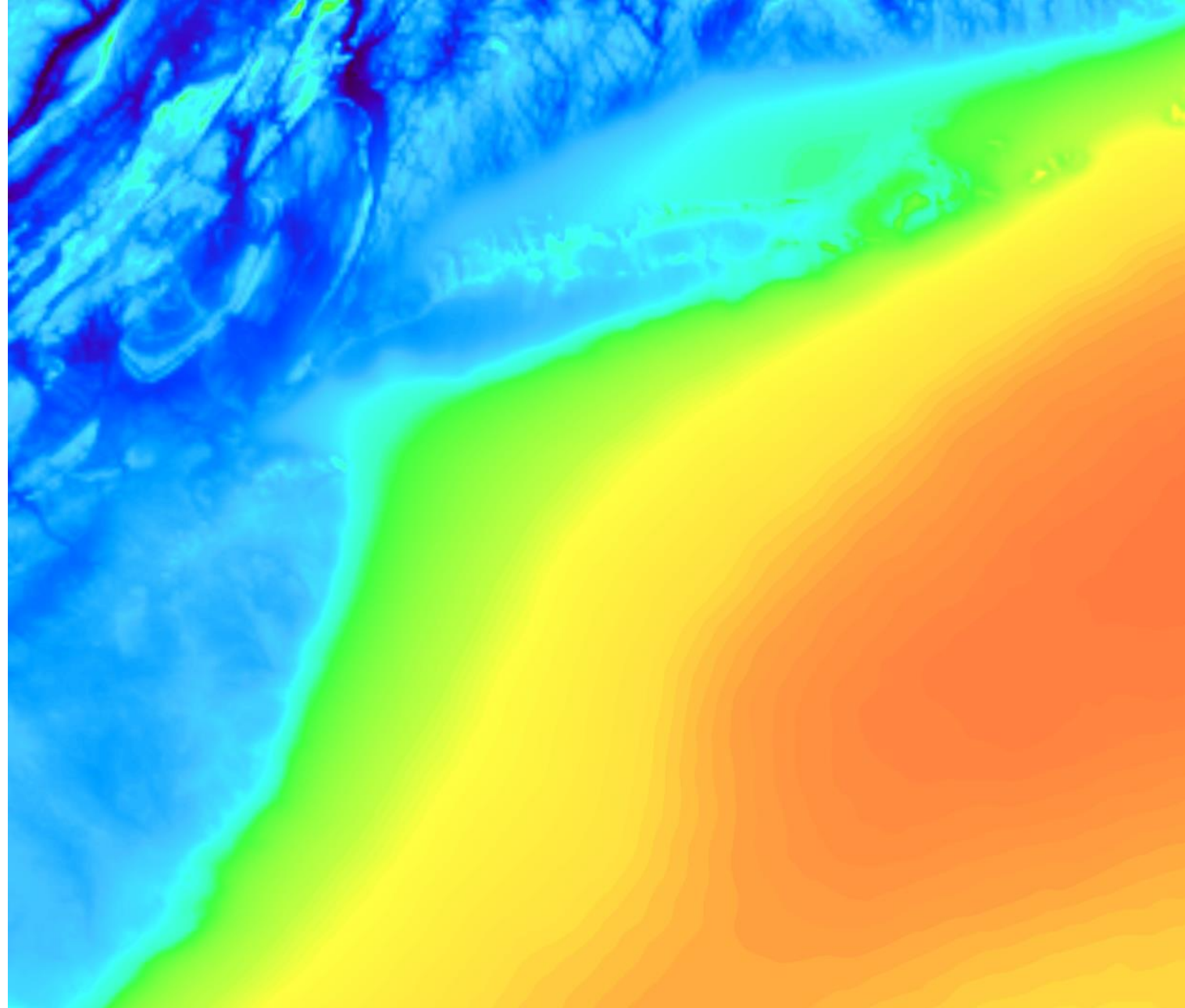
MDI-O In practice-Wind AXIOM

Make requests to TB data volumes instantly.

Work with very large datasets in-browser

Connect 10+tb data volumes into web applications

Recall statistics, maps and visuals instantly.

Plot Charts & Diagnostics

Plot Weibull wind frequency distribution..
…and use to present top level AEP summary

Retrieve statistics

Summarise top level data instantly

Export pdf reports /tables

Browse timeseries

Browse data in-app

Export Timeseries and .wrg dynamically

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Integration with Observations in UN

Our objective- to enhance wind models with offshore observations, including Utsira Nord

Utsira Nord Floating Lidar Buoy

Deployment April '23

Floating Flidar system incl Metocean sensor suite

Developers access data earlier

Adding Value with Observations

Bias Correction
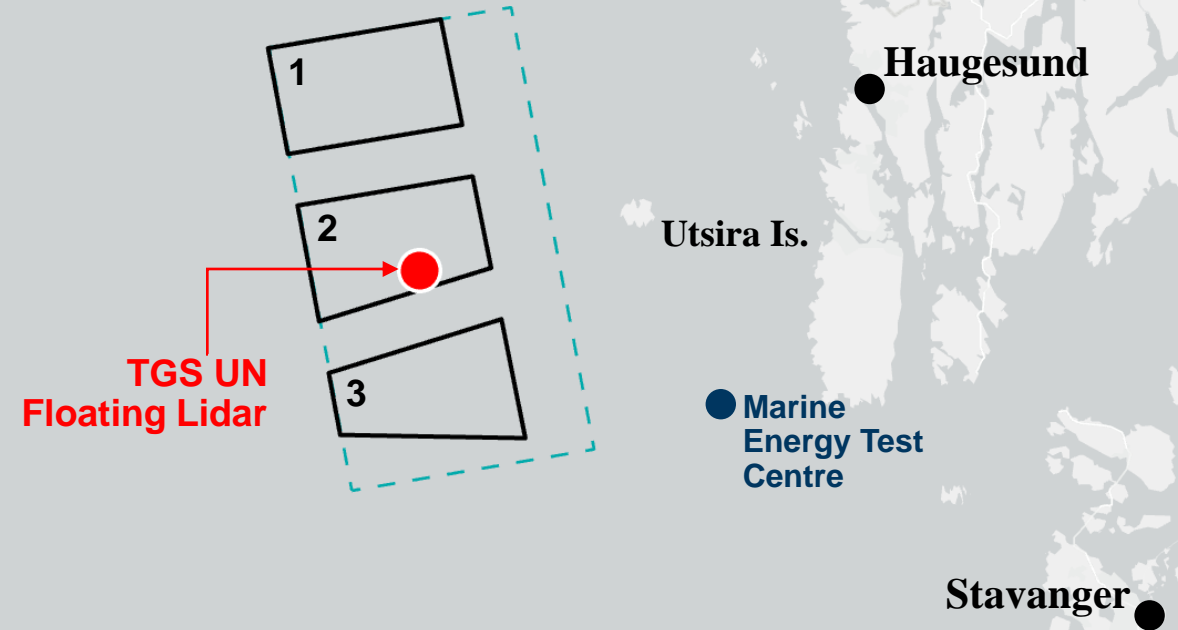
Obs. vs Long term mean comparison

Comparison with multiple models/heights

Uncertainty Reduction

First offshore measurement in Utsira Nord brings significant reduction in uncertainty of wind resource estimates.

Available for Industry

Available to license to industry on multi-client basis for developers, consultancies, insurance

TGS UN Floating Lidar

Haugesund

Utsira Is.

Marine Energy Test Centre

Stavanger

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Developing baseline data for project lifespans

A high quality regional wind resource data model with unrivalled observational control and cloud flexibility

Regionally consistent quality

Same consistent dataset

Covering multiple license rounds

Regular updates and bias correction

New and growing observational control

Bias correction with 5 TGS Floating Lidar

Inclusion of existing public observations

More observational control!

Includes Metocean Parameters

Metocean and environmental parameters also extremely valuable

Integrated with 30 public Metocean observations

Easy and export and integration

Designed with technical workflows in mind!

Convenient exports to .wrg, timeseries and connections to feature APIs available.

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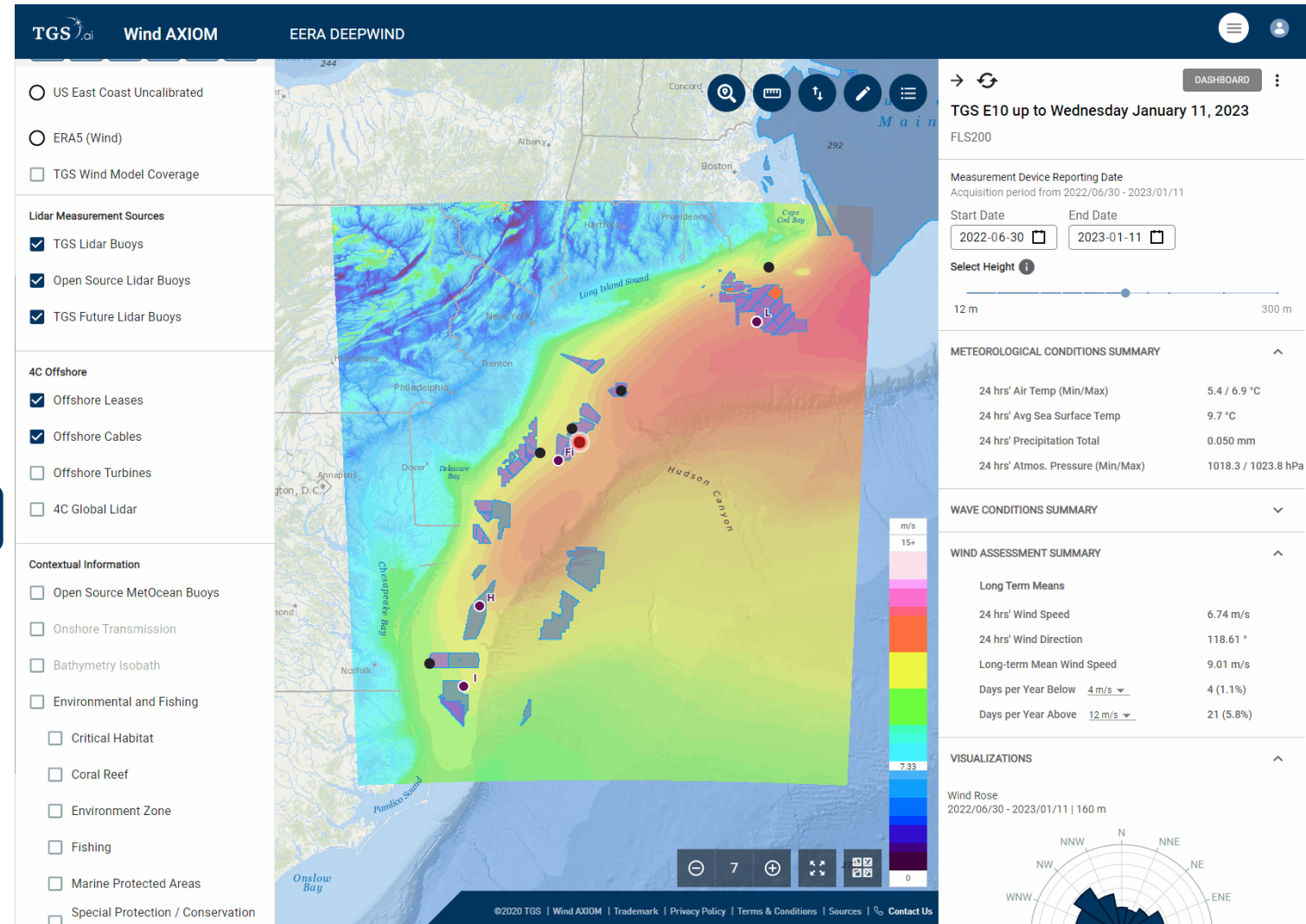
MDI-O In practice

Call our documented Feature APIs using your own methodologies or applications

Call our Feature APIs directly

Call performant versions of popular datasets (ERA5, NEWA) or our own proprietary baseline data

Reduce requirements for cloud storage & management

Combine with existing py workflows

Your python/ data science workflows considered! Call and include answers from our APIs in your existing workbooks or models.

Combine with your AEP calcs.

Your existing internal apps are compatible

Your existing cloud applications are compatible

Feature API's designed with easy deployment of common statistics

GIS services also available

Ready for collaboration

TGS are a collaborative team and looking for new ways to use these services with industry!

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Conclusion

Our objective- to enhance wind models with offshore observations, including Utsira Nord

MDIO technology Enabler

Smart decisions underpinning the data open wider possibilities for our applications and many use cases for 3rd party apps and workflows

Worldwide Data availability

Stacking multiple model resources together provides greater spatial coverage and ability to compare model expectations in the same location.

Reduce mundane tasks

Searching, formatting, copying and updating data is time consuming- spend your time where you add most value!

Multi-Client Observations

Multi-Client observations increase confidence in data earlier and for more users. Collections of multiple observations are yet more powerful.

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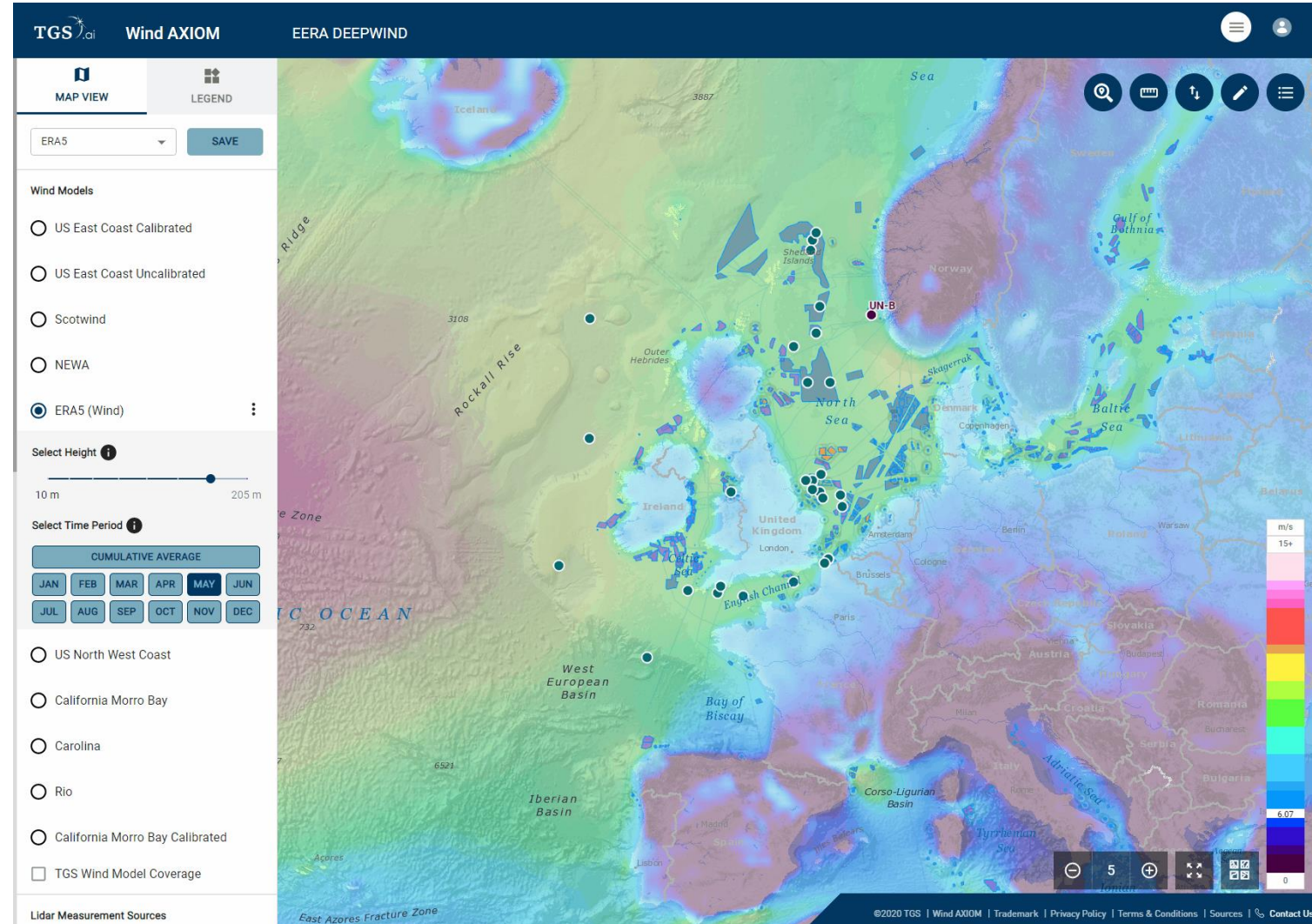
Further information

Read more about MDI-O. https://mdio.dev/

Looking to Collaborate? Please get in contact!!

Browse available APIs available from TGS:
https://swaggerhub.tgs.com/apis/TGS/iwa-data-api/2.0.0

Understand more about multi-client lidar in Norway:

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phillip.hargreaves@tgs.com

Request a free Wind AXIOM Trial
https://www.tgs.com/wind

Or come and see it for yourself today!

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