BLUE MARBLE GEOGRAPHICS
MIND THE GAP BETWEEN WORLD AND MAP®

WindSim AS

Leveraging the Global Mapper SDK to Create Powerful Forecasting Software for Wind Energy Solutions

BACKGROUND

WindSim AS develops and delivers advanced software solutions and consulting services that help wind energy industry leaders design highly profitable wind farms. WindSim, the company's flagship product, is a world-class software solution based on Computational Fluid Dynamics (CFD) technology used to optimize wind turbine placement, wind performance, and bankable Annual Energy Production (AEP). This robust software combines advanced numeric processing with compelling 3D visualization in a user-friendly interface. WindSim offers a number of add-on modules as well as easy-to-use software tools including the Remote Sensing Correction module, Multiple Core Utilization module, Park Optimizer module, Power Forecasting module, and the WindSim Express design tool.
Founded in 1993, WindSim is a privately-held, venture-backed company based in Tønsberg, Norway with offices and partners in Argentina, Brazil, Canada, China, Costa Rica, Finland, Greece, India, Italy, Korea, Mexico, Serbia, Spain, Turkey, and the U.S.A

CHALLENGES

WindSim is employed in the design of both onshore and offshore wind farms, maximizing AEP while taking the site and terrain constraints into account. The software combines advanced numeric processing with compelling 3D visualization in a user-friendly interface.

WindSim is based on a 3D Reynolds Averaged Navier Stokes (RANS) solver. Solving the non-linear transport equations for mass, momentum, and energy makes WindSim a suitable tool for simulations both in complex terrain, and in situations with complex local climatology. The assessment of wind resource potential is carried out through both observational and numerical means. Observational data is usually collected for one or more points within a proposed wind farm de-

CASE STUDY

overview

INDUSTRY:
Wind Energy Forecasting

CUSTOMER PROFILE:
WindSim is a software developer specializing in wind forecasting solutions. The company is based in Tønsberg, Norway with offices throughout the world.

PRODUCT:
Global Mapper Software Developer Kit

CHALLENGES:
Developing software solutions to accurately forecast wind flow

Finding elevation, roughness, and map imagery data to create CFD models

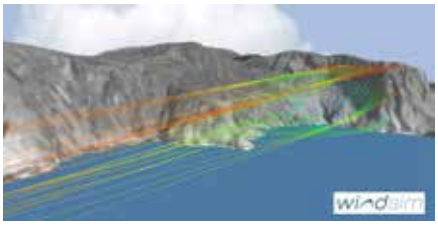
Providing tools for creating and converting data into gws format

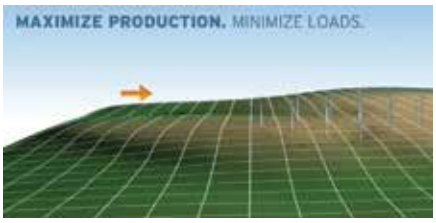
SOLUTION:
WindSim uses the Global Mapper SDK, saving time and money in the development process and providing users with trusted technology that meets their needs to predict wind flow.

BENEFITS:
The user is able to set-up a CFD project, everywhere on the globe in just a few minutes

Enhanced Technical Support

Blue Marble Developer Network

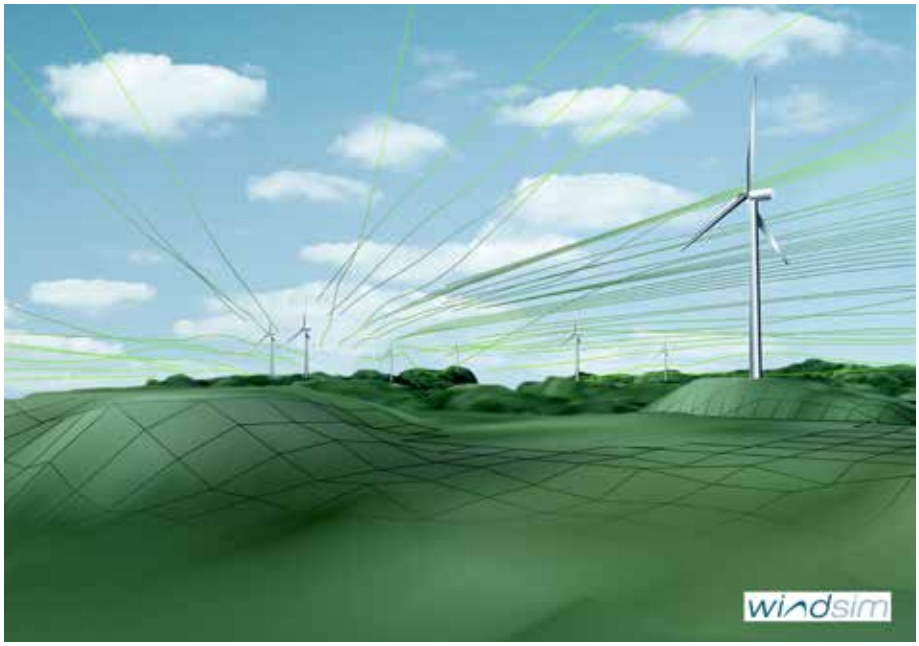




FROM THE BEGINNING

"Work with the Global Mapper SDK has enabled us to offer our software solution as a cloud-based service and thereby reach out to every person on the globe who would want to do wind energy calculations based on CFD."

Catherine Meissner
Software Development Manager
WindSim



velopment site; however, these observations do not account for the terrain-induced variations in the local wind fields between or around the observation points.

In order to accurately create 3D simulations of the wind flow around the observation points, it is necessary to have adequate terrain and roughness data. To extract these datasets and convert them to a format which is readable by WindSim software, the development team needed existing technology that could be seamlessly incorporated into WindSim products.

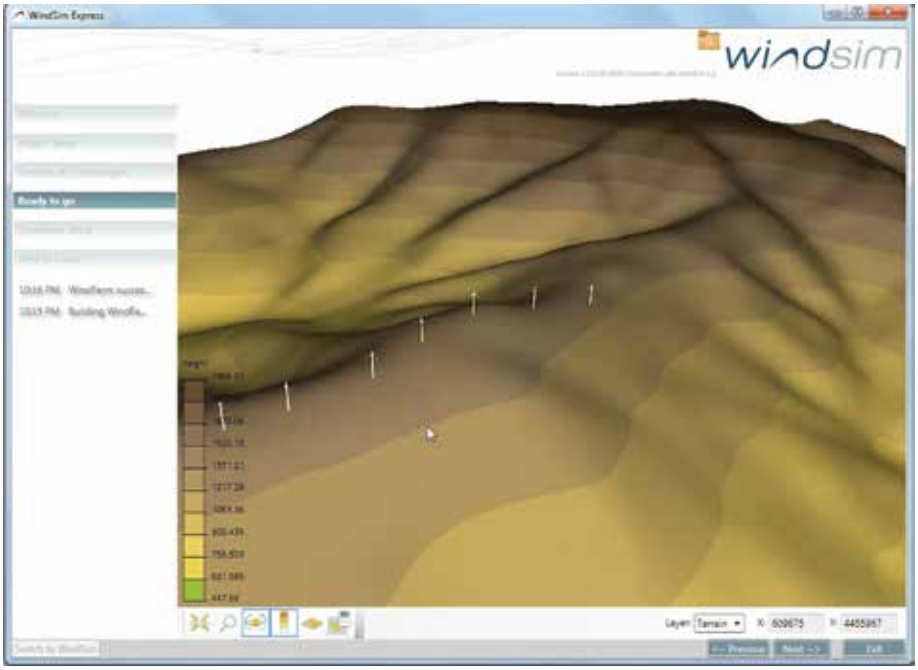
SOLUTIONS

For over a decade, Global Mapper has developed a loyal following within the GIS community for its ability to import and export over 250 data formats. Through the use of the Global Mapper Software Developer Kit (SDK), WindSim is able to leverage this powerful technology to significantly streamline both the development process as well as the user's ability to create and analyze raw wind energy data. This eliminates the need for a separate data conversion application. It also improves productivity and eliminates potential data compatibility/projection issues that are often encountered when manually transferring files between different programs and platforms.

Global Mapper has attained a deserved reputation as an indispensable spatial data management tool for thousands of users throughout the world. The incorporation of this technology in WindSim ensures that wind farm developers have access to the same advanced functionality.

By leveraging Blue Marble's spatial software development prowess, application engineers at WindSim are able to focus their attention on developing industry-specific functionality. WindSim is able to deliver a well-rounded product with robust tools to quickly create terrain models and roughness grids that in return deliver 3D visualization to accurately forecast local wind flow patterns.

By combining wind flow observations with WindSim's advanced CFD flow modeling algorithms, the user can create a full 3D model of the wind fields including mean wind speed, turbulence, wind shear, and inflow angles. This allows for more informed decisions about turbine layout and accurate estimates of AEP.



Terrain model in WindSim Express

PRODUCT EXAMPLE

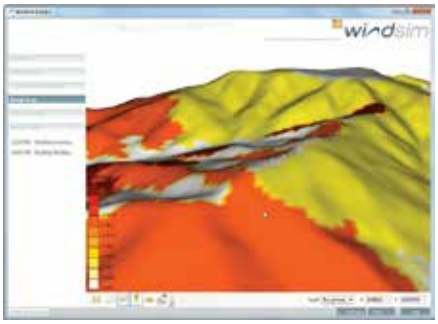
WindSim Express is a tool to create micro-sites in three simple steps. By leveraging Global Mapper's large library of online data sources, WindSim Express automatically accesses elevation, roughness and orthoimagery data from the cloud after the user specifies the data source and turbine location. Subsequently, wind measurements are then imported without any need for data conversion. The wind farm layout is created by importing a list of coordinates in spreadsheet format. Users have the option to choose from a comprehensive list of coordinate systems provided by Global Mapper's library. After the project has been completed in WindSim Express, users have the option to upload their project to WindSim in the cloud or to work locally to perform more advanced modeling functions. For more information on WindSim Express and creating micro-sites visit https://youtu.be/M7cGCJrmikQ and for info on how to upload a project to WindSim Cloud check out this video https://youtu.be/M7cGCJrmikQ.

Data source window

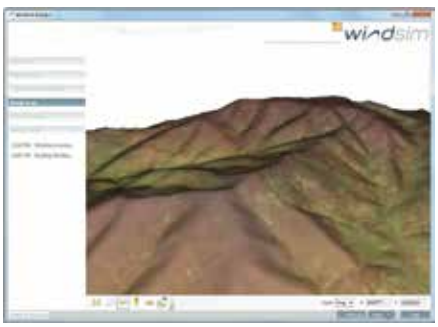
THE BOTTOM LINE

"Being able to work with Global Mapper has reduced the amount of working time to set-up a CFD model from days to minutes and is saving every consulting company thousands of dollars each year."

John Olaf Rømma
CEO
WindSim



Roughness model in WindSim Express



Map imagery in WindSim Express

Data source window in Global Mapper

BENEFITS

When working with the Global Mapper SDK, the WindSim development team not only benefits from having access to trusted technology but also from having access to the Blue Marble Geographics development team for enhanced technical support. “GM is easy to use, provides exactly what we need, and has excellent support,” stated Catherine Meissner, Software Development Manager for WindSim. “Excellent support is very important in achieving the expected results as there is no manual when developing a custom software solution.”

Additionally, Blue Marble offers its SDK partners the opportunity to join the Blue Marble Developer Network. This program helps promote partners software and the value Blue Marble adds as a service and technology provider. For more information or to join the program contact the Blue Marble sales team (sales@bluemarblegeo.com).

ABOUT THE PRODUCT

The Global Mapper SDK provides a Windows DLL which allows much of the functionality of Global Mapper to be accessed from third party applications. Developers can improve existing software, create custom stand-alone applications, and extend Global Mapper’s Desktop functionality through toolbars and menu items. The SDK includes both native 32-bit and 64-bit DLLs, so developers can target any Windows system. The Global Mapper SDK is a standard Windows DLL and can be called from just about any programming language on a Windows platform, including Visual C++, Visual Basic, Visual C#, and Java with JNI.

ABOUT BLUE MARBLE GEOGRAPHICS

Trusted by thousands of GIS professionals around the world, Blue Marble Geographics is a leading developer of software products and services for geospatial data conversion and GIS. Pioneering work in geomatics and spatial data conversion quickly established this Maine-based company as a key player in the GIS software field. Today’s professionals turn to Blue Marble for Global Mapper, a low-cost, easy-to-use yet powerful GIS software tool. Blue Marble is known for coordinate conversion and file format expertise and is the developer of The Geographic Calculator, GeoCalc SDK, Global Mapper, LiDAR Module for Global Mapper and the Global Mapper SDK.

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