

NASA World Wind

Visualization Tehnology for Spatial Data

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Abstract. Spatial information intelligence is a global issue that will increasingly affect our ability to survive as a species. Collectively we must better appreciate the complex relationships that make life on Earth possible. Providing spatial information in its native context can accelerate our ability to process that information. To maximize this ability to process information, three basic elements are required: data delivery (server technology), data access (client technology), and data processing (information intelligence). NASA World Wind provides the open source client technology based on open standards. The possibilities for data processing and data sharing are enhanced by this inclusive infrastructure for geographic information. It is interesting that this open source and open standards approach, unfettered by proprietary constraints, provides for unlimited innovation with this technology.

Why World Wind? Over ten years ago NASA World Wind began as a single program with specific functionality, to deliver NASA content. But as the possibilities for virtual globe technology became more apparent, NASA found that while enabling a new class of information technology, we were also getting in the way.

Researchers, developers and even users expressed their desire for World Wind functionality in ways that would service ^{^their^} specific needs. They want to add their own features. They want to manage their own data. They told us that only with this kind of flexibility, could their objectives and the potential for this technology be truly realized. World Wind is a set of development tools, a software development kit (SDK) that allows a software engineer to create applications requiring geographic visualization.

Modular Componentry. Accelerated evolution of a technology requires that the essential elements of that technology be modular components such that each can advance independent of the other elements. World Wind therefore changed its mission from providing a single information browser to *enabling* a whole class of 3D geographic applications. Instead of creating a single program, World Wind is a suite of components that can be selectively used in any number of programs.

World Wind technology can be a part of any application. Or it can be extended with additional functionalities by application developers. World Wind makes it possible to include virtual globe visualization and server technology in support of any objective. As open source, the world community can collectively collaborate in advancing this technology, and thereby continually benefit from optimization and increased functionality of this open source infrastructure.

Open Source + Open Standards = Accelerated Solutions. NASA World Wind is NASA Open Source software. This means that the source code is fully accessible for anyone to freely use, even in association with proprietary technology.

World Wind Community. World Wind is used by several of the world's space agencies (NASA, ESA, JAXA, DLR, etc.), various national governments, as well as the US government and state agencies, UN, NATO, the World Bank, and several Fortune 100 companies, amongst many others who need to manage spatial data in highly customized ways, including resource management, supply chain, emergency response and defense. In 2009, World Wind was awarded NASA Software of the Year. And due to its world-class quality, a sophisticated international talent base has built up via the forum at www.WorldWindCentral.com. This website gives the world community a mutually supportive environment for application development using World Wind technology. Additionally, there are excellent World Wind tutorials online, generously provided by third parties.

Facilitate Solutions. The ability to effectively deliver spatial data is an essential element to stimulate innovation in the realm of remote sensing, via satellite or ground sensors. Open standards for data format facilitate data access. In the same manner, an open source 'standard' visualization tool facilitates the ability for others to generate spatial data solutions, proprietary or other. This open source technology for data access and visualization, also improves the ability for information intelligence, the analytical results, to be readily and more effectively shared. NASA World Wind open source technology provides the foundational tool for spatial data visualization and facilitates the creation and evolution of spatial data analysis and information exchange.