



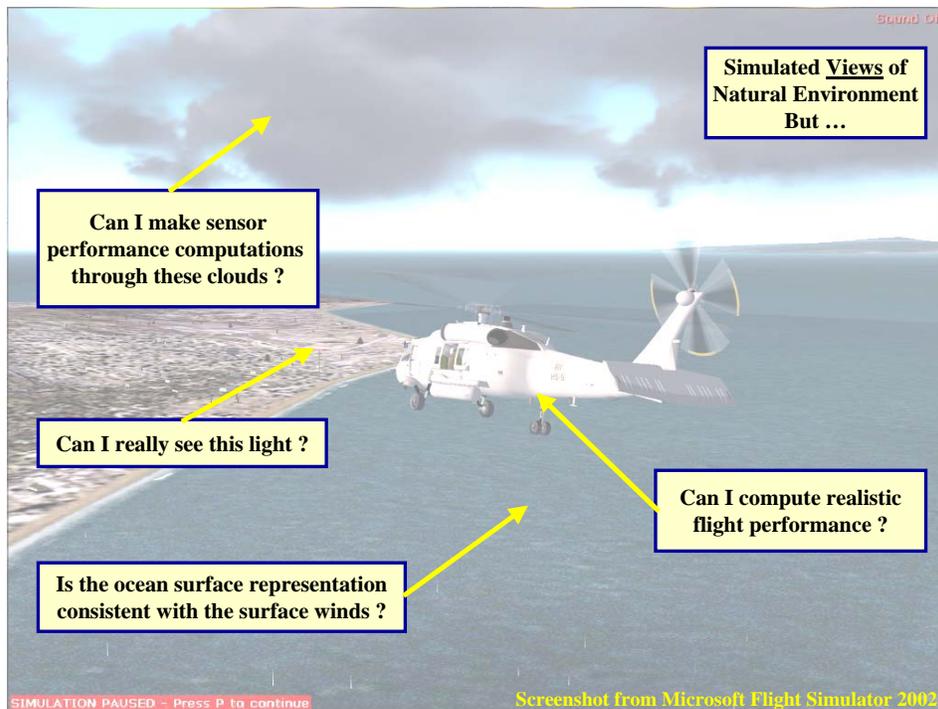
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ESG GENERATES REALISTIC ATMOSPHERIC REPRESENTATIONS FOR USE IN DOD APPLICATIONS

The Environmental Scenario Generator (ESG) generates realistic atmospheric representations for use in DoD applications.

It's no longer too hard ... It no longer takes too long ... It's no longer too expensive to obtain the right environmental representation ... and it makes a difference in simulation results.

New DoD simulation programs place greater importance on realistic environmental representation, specifically on the effects that the natural environment has on operations. Therefore, the DMSO and the Air and Space Natural Environment (ASNE) M&S Executive Agent (MSEA) joined forces in 1998 to begin development of the Environmental Scenario Generator (ESG) capability to produce on-demand environmental representations that evolve over time as environmental scenarios.



ESG use in JWARS: Planned SUCCESS – now realized

The ESG provides the Joint Warfare System (JWARS) all required atmospheric data. Recently, a JWARS scenario supporting the DoD Analytical Agenda produced “unexpected” results in Intelligence, Surveillance, and Reconnaissance (ISR) sensor behavior. As it turned out, the analysts had selected a time period for their area of interest when a strong storm was present. Having previously used legacy simulations containing few if any environmental interactions, the analysts had never before been faced with environmental effects. JWARS, however, is designed to use the weather,

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Success Stories

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allowing analysts to observe and address realistic system behaviors. Prior to this, clouds never affected ISR systems, either because the clouds were not included in the environmental representation or the sensors had not been modeled to account for cloud interaction. The JWARS Program Office said this case demonstrated the simulation's unique capability to account for a dynamic natural environment. The fielding of JWARS to 49 user sites—including the Military Services, Combatant Commands, Joint Staff, OSD, and Defense Agencies—will result in broad ESG use supporting JWARS users.

ESG technology part of a larger plan

In 1999, the DoD Environmental Representation MSEAs (Air & Space, Ocean, and Terrain) and DMSO developed a strategy and supporting Concept of Operations (CONOPS) to identify required capabilities to meet the DoD M&S Master Plan objective to “provide timely and authoritative representations of the natural environment.” The resulting Integrated Natural Environment (INE) Strategy and the INE Authoritative Representation Process (INEARP) CONOPS supports the DoD M&S vision to “provide readily-accessible, operationally-valid environments for use by DoD components.” Environmental representation is a critical component required by DoD simulations.

The INEARP CONOPS provides for a repeatable, cost-effective process that generates physically consistent, authoritative environmental representations for use by warfighters in their models and simulations. At the heart of the INEARP is an infrastructure of common services, scenario generation capabilities, and interchange mechanisms molded into a standard process to produce integrated authoritative environmental representations. The ESG provides the backbone technology of that infrastructure and provides the means for the simulation user to specify a geographic area and environmental conditions of interest and find historical air, space, and ocean scenarios that satisfy the specified simulation event conditions. Production and delivery of the dataset containing the physically consistent environmental representation will be coordinated using ESG technology and its network of resource providers. This revolutionary system will provide a responsive and authoritative Just-in-Time environmental representation production capability, and simulations like JWARS will be able to obtain all their environmental data from a single source, the ESG.

Capability available today—FREE to the DoD user

In the past, it was too hard, took too long, and was too expensive for simulation programs to develop realistic environmental representations. Each simulation program had to start from scratch, often spending hundreds of thousands of dollars and waiting up to a year just to get a few weeks worth of environmental data. Even then the data sets provided were not easily used or necessarily physically consistent. With the ESG, simulation programs now have a single point of contact for obtaining realistic atmospheric representations. The ESG makes it easy to obtain the required representations by allowing simulation users to specify the required parameters to meet conditions of interest (e.g., “cold and snowy” or “hot and dusty”), the area and time/season of interest, and the desired delivery format. ESG is responsive—an 18-month regional dataset for JWARS took 4 months to produce in 1999, and now it only takes 1 month. In addition, the ESG eliminates the often-high cost of data production by generating atmospheric environmental data sets at no cost to DoD users.

Current ESG capability is primarily atmosphere-oriented. The ASNE MSEA is transitioning this DMSO-funded technology to an operational prototype system at the Air Force Combat Climatology Center (AFCCC) in Asheville, NC. AFCCC generates the atmospheric data requested by M&S users through the ESG with the user-specified conditions meeting the criteria needed for the simulation.