

SUCCESS STORY

TOPIC NUMBER:
N151-071

SBIR INVESTMENT:
\$2,131,368

PHASE III FUNDING:
\$3,704,807



INTELLIGENT MARITIME MINEFIELD PLANNER (IMMP)

Daniel H. Wagner Associates, Incorporated developed algorithms and software that evaluate and optimize sensor placement and delivery for multiple maritime sensor fields, increasing the effectiveness of U.S. Navy undersea warfare.

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THE CHALLENGE

There are several gaps within sensor field planning, modeling and simulation capabilities. As new sensing technologies emerge, the Navy will need new software methodologies to investigate capabilities, drive new requirements and measures of effectiveness, address training needs and meet Navy strategic goals. Future sensor fields will use precision emplaced unmanned systems requiring interaction among many functional elements, battlespace environments, and adversarial courses of action. To achieve this, the Navy required the development of an integrated software framework for sensor field mission planning and assessment capabilities. This software should support both traditional sensor planning, as well as future concepts that utilize distributed vehicles, sensors, weapons and other disruptive effects.

THE TECHNOLOGY

Daniel H. Wagner Associates, Incorporated developed the Intelligent Maritime Minefield Planner (IMMP). Through this technology, algorithms and software components fully support the planning, effectiveness, evaluation, deployment, and monitoring of optimized military effective maritime sensor fields. IMMP operates at the individual sensor field level and the operational and strategic levels. It can be used for random sensor placement or specified sensor placement in either conventional or advanced sensor fields. IMMP supports main commander tasks for an individual sensor field or group of sensor fields in a theater. These tasks include determining the minimal number of assets necessary to achieve a specified effectiveness level and the highest effectiveness levels that can be obtained given available assets. IMMP has an intuitive user interface that supports easy comparison of alternative sensor placement courses of action and automatically generates accurate estimates of target location using all available data.

THE TRANSITION

Wagner Associates' IMMP algorithms and software evolved from an SBIR Phase II award under topic N151-071 titled "Dynamic Minefield Operations (DMO)." The Office of Naval Research (ONR) awarded Wagner Associates an SBIR Phase III award for IMMP to further develop this technology for the next generation naval sensor field program.

THE NAVAL BENEFIT

Since Wagner Associates' IMMP automatically generates exact estimates of target location using all available data, Navy undersea warfare, surface warfare, and air warfare operations are more effective. IMMP recommends more efficient and effective use of limited surveillance and strike assets, resulting in higher probability of detecting threat platforms, and reduced friendly unit vulnerability. Because IMMP automatically generates accurate target location estimates and optimized recommended plans, planner or operator time on task is reduced and the response to operational changes is faster than traditional methods.

THE FUTURE

Wagner Associates' algorithms and software components continue to support mission planning for the Navy through mission effectiveness evaluation and optimization, risk determination, and data fusion. Wagner Associates' fielded systems support Naval Air Systems Command (NAVAIR), Naval Sea Systems Command (NAVSEA), Defense Advanced Research Projects Agency (DARPA), and the Office of the Secretary of Defense (OSD).