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The Last Word - State of the Art in Military OR

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MORS

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State of the Art in Military OR

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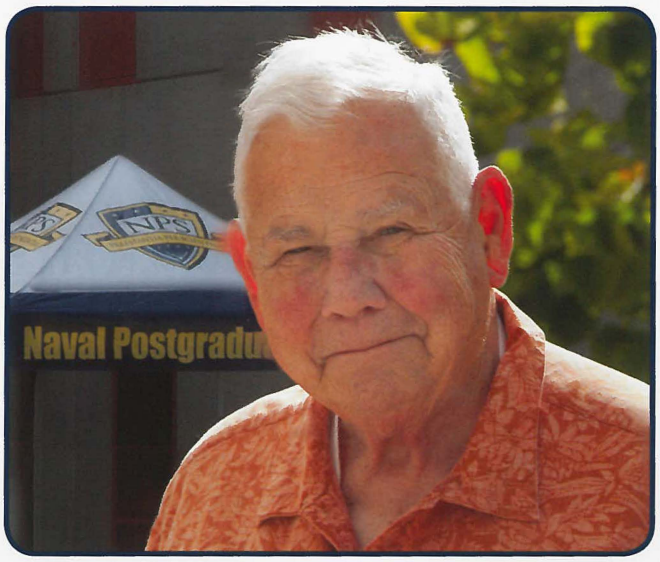
I begin with a few reminiscences from the past and conclude with two comments on the state of the art of military operations research (OR) today.

Phalanx Editor Terry McKearney's alma mater and my employer is hosting the Military Operations Research Society (MORS) Symposium this year. I was Terry's thesis advisor at the Naval Postgraduate School. His was one of my favorites among more than 100 theses, including those by VADM Patricia Tracey, ADM Mike Mullen, RADM Sinclair Harris[a] (one of our first African-American admirals), RADM Bill Landay (later the Chief of Naval Research), and Captain Lee Dick, FS, who has contributed so much to MORS. Terry's thesis looked in quantitative detail at the surface battles in the 1942–1943 Solomon Islands campaign: e.g., weapons fired by both sides, battle durations, and our bad and later good tactics against the well-practiced Japanese surface fleet. For lasting lessons in logistics, tactics, and joint air-sea-land cooperation, the fighting first around Guadalcanal and later in the upper Solomons are still valuable.

Another connection is that we both regarded Erv Kapos, FS, as a mentor. Erv persuaded me to attend my first MORS Symposium, the 28th, at Fort Lee in 1971. I brought in distinguished speakers for a naval warfare working group I still remember fondly, including Bernie Koopman, John Kettelle, and then-captain, later VADM, Staser Holcomb. After Fort Lee, I was hooked on MORS as the best way to stay abreast of military OR in all its breadth and have watched it improve in variety and wide application over almost 50 years. Sponsorship expanded from the Office of Naval Research (ONR) in the Navy to many higher-level sponsors with an interest in successful military OR. Under Jack Walker, Phalanx expanded its coverage. When Vance Wanner retired as executive manager, I was happy to vote for Dick Wiles to replace him. Dick graduated from West Point the same year I graduated from the Naval Academy and we both "went to Korea" but my involvement in the Sea of Japan was not as risky as his was on the ground.



That background brings me to two comments on the state of the art of military OR today.

First, I have watched our joint campaign analysis student projects grow over 30 years in complexity and increases in the amazingly useful insights these quick response analyses delivered. Three technological advancements made this possible: (1) the power to do swift, complicated calculations using Excel and other spreadsheets; (2) the ease with which PowerPoint slides can be assembled, shuffled, and modified; and (3) most remarkable of all, the insights gained from consulting Google maps. We give our campaign analysis students only three weeks to produce a "quick-turn-around" quantitative analysis. My co-teacher, Jeff Kline, and I tell them to follow the "one-third rule": one-third of their time is spent figuring out how analysis will best assist a decision maker plan a battle or campaign in an environment of uncertainty; one-third is all the

time they have to do the quantitative analysis (in our ministudies that is only one week for analysis); and one-third of their time is for follow up, answering decision maker questions and recovering from mistakes! We tell them to aim for an "80% solution" that can be refined later by other tools such as complicated simulations, wargames, and in the best of worlds, at-sea experiments and exercises. We are 80% of the way if we head in the right direction, and it may take months or years to refine the solution with more detailed tools.

Second, I am happy to see the recent return to at-sea experiments now being espoused by Navy leadership. My operational experience was filled with exercises and experiments, mostly in antisubmarine warfare. I was impressed with the at-sea experiments led by the Submarine Development Group to prepare us to take on and defeat the bigger Soviet submarine navy, operating in waters that approximated the Norwegian Sea and off Petropavlovsk. In recent years, the Navy has relied too much on large-scale simulations and complicated wargames that are slow and cumbersome. Exploratory analysis that tests new campaign plans, tactics, and technologies is better when it is relatively simple and transparent. Wargames and intricate simulations are most valuable when they test, expand on, or fill in the details of the "80% solution" derived from transparent analysis done with simpler models and spreadsheet analysis.

Note

[a]Admiral Harris was the author of "The Last Word" in the March 2018 *Phalanx*, where he talked about the modern analyst's toolbox. – Ed.

About the Author

CAPT Wayne P. Hughes, Jr., is a professor of operations research at the Naval Postgraduate School and a Fellow and Past President of MORS.