

HSRP comments on the National Ocean Mapping, Exploring and Characterizing the US EEZ (NOMECH)

The Hydrographic Services Review Panel (HSRP) recognizes and supports the importance of the recent Presidential mandated strategy stated in the referenced National Ocean Mapping, Exploring and Characterizing the US EEZ (NOMECH) document. Ocean mapping, exploration and characterization provides comprehensive data and information needed to understand seafloor characteristics such as depth, topography, bottom type, sediment composition and distribution, and underlying geologic structure, required to advance the economic, security and environmental interests of the United States. As it is the intent to roll out NOMECH in two stages, this document is focused on the first phase related to water depths greater than 40 m. The HSRP believes in and supports the key elements and steps related to this important initiative:

1. Everything starts with a map.
2. Maps of high-resolution and accuracy, presented as both the first step and the keystone to comprehensive understanding/creating good policy, will demonstrate the justification and benefits of NOMECH to the public and funding mechanisms.
3. Emphasis should be placed on public/private and academic partnerships designed to emphasize and include other data sources and sensors.
4. Use of autonomous systems (unmanned systems, artificial intelligence and cloud) and strategies for application now and in the future should be emphasized and encouraged.

As for implementing the NOMECH strategy, the HSRP believes consideration should be given to the following:

- 1) It is the policy of the United States to act boldly to safeguard our future prosperity, health and national security through ocean mapping, exploration, and characterization. This fundamental statement directly applies to the benefits of the NOMECH strategy in support of the Blue Economy's goals and drivers, thus warranting the support of "Everything starts with a map". It is impossible to make informed policy, legislative, regulatory and management decisions without a good base map. Technologies available to apply to this effort have allowed us to expand on the definition of a map. Mapping and characterization of the ocean now includes more than just the shape and depth of the seafloor. We now can provide a multi-disciplinary first look at an unknown or poorly understood area of the ocean such as obtaining properties from the sub-bottom, physical, chemical, and biological characteristics of the water column. All these characteristics are obtained from a single platform and a single pass.
- 2) Modern, next-generation sensors and software, give us the ability to generate maps and information products that are easy for non-scientists and non-engineers to understand. Visualization products are simple yet detailed enough to allow the general public to not only understand the features being displayed, but also draw

conclusions about what is relevant and of value within information derived from the data and presented in the maps. In turn, the acceptance and application of the products derived from high quality maps will provide the first step and the keystone to comprehensive understanding, which in-turn will lead to the development of informed policy, legislation, regulation and management decisions. This process will make it easier to demonstrate to the public and to justify funding based upon the importance and need for the benefits of the NOMECH strategy. Data standardization, such as the Standard Ocean Mapping Protocol (SOMP) is a critical process for bringing data into a common format that streamlines application for collaborative research, large-scale analytics, and the sharing of sophisticated tools and methodologies. In addition, the multiple applications between the public/private and academic partnerships are expanded and appreciated.

- 3) The emphasis on private/public and academic partnerships also provides multiple layers of benefits. There are numerous examples of successful mapping projects that were driven by the support of partnerships throughout all portions of the programs. In the initial stages, these partnerships allow for awareness and discussions on what are the important goals of the study, geographic priorities, data standards and protocol, relative importance and multi-uses of maps. Importantly, academic and private participation also stimulates innovation and scientific focus for future developments, including sensors, via knowing what is, or will be, important to mapping capabilities and products in the future. These same benefits are also relevant and shared throughout the course of the mapping and generation of map products, such as the production of high definition Electronic Navigation Charts (ENC) for precision navigation. Also it promotes continuous improvement and expansion of ideas and direction. The final products will then be made available to a very wide array of interested and diverse parties, ultimately expanding on the success of the program, including a variety of willing participants and enthusiastic users of the end results.
- 4) The HSRP recognizes the importance of autonomous systems (including unmanned systems, artificial intelligence and cloud) and strategies for present and future mapping applications, and believes these methods should be emphasized and encouraged. Autonomous surface and sub-surface platforms, airborne platforms, autonomous data processing, information extraction and management, are just a few of the relevant systems that are already being applied successfully. The industry response to the current and ongoing restrictions generated in response to the current pandemic crisis has stimulated rapid development of and an expanding number of autonomous systems and methods successfully being applied across ocean mapping programs. These updated methods are hampered by or conflicted with an outdated and slow-moving regulatory framework. However, we strongly urge support to continue and to expand these technologies, leveraging innovation and development that is already occurring in the public/private, and academic sector. Robust and inclusive frameworks to identify and test (via pilot projects) potentially strong, emerging science and technology must be established.