Analysis of State-Of-The-Art Hydrographic Survey Techniques

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SUMMARY

Bathymetry data is critical for safety of navigation and is used for many other applications. The world's oceans cover 71% of the Earth, but we still have mapped less than 20 percent of the world's oceans and 50% of the total global continental shelf area (shelf depth is shallower than 200 m) was unsurveyed or inadequate surveyed according to IHO S-44 standards. Continental shelves make up about 8% of the entire area covered by oceans and seas and the remaining parts have a poorly defined sea bottom. Therefore, it is necessary to find efficient and preferably cost effective methods of bathymetry determination.

Determination of bathymetry, or measurement of underwater topography, is very challenging and demanding task therefore, efforts are being made to find new techniques that will successfully solve it. The decision is to go in two directions, solving airborne/spaceborne and in situ measurement techniques.

Today four types of airborne/spaceborne shallow water bathymetry measurement techniques are most commonly used:

1. LIDAR or laser scanner technique;

2. Satellite Derived Bathymetry technique (multispectral imagery);

3. Airborne Derived Bathymetry (ADB);

4. SAR technique (Synthetic aperture radar - SAR

imagery).

There are also two „in situ“ techniques which have started to be used in the last few years:

1. Unmanned surface vehicles (USV);

2. Remotely operated underwater vehicle (ROV).

The paper will briefly describe each of these „non-traditional“ batimetric data collection techniques, as new and innovative technologies that can increase the efficiency of collecting bathymetric data. The description will include all advantages and disadvantages of individual techniques, approximate cost of equipment and measurements, the achieved measurements accuracy, the range of depths that is achieved. Finally, optimal techniques of bathymetric survey for the coastal shallow part of the middle and south Adriatic will be recommended.