



## **Use of modular amphibious vehicles for conducting research in coastal zone**

Denis Zeziulin, Vladimir Makarov, Alexander Belyaev, Pavel Beresnev, and Andrey Kurkin  
Nizhny Novgorod State Technical University n.a. R.E. Alekseev, Nizhny Novgorod, Russia (aakurkin@gmail.com)

The project aims to create workable running systems of research complexes, moving along the bottom of coastal areas (in shallow waters) for investigation of waves, currents, sediment transport; investigation of ecosystems and biodiversity assessment of organisms; inspection and monitoring environmental conditions and anthropogenic load on nature; bathymetric studies.

With all the variety of functional capabilities of modern robotic systems, possibilities of their application in the context of the study of coastal zones are extremely limited. Conducting research using aerial vehicles is limited to safety conditions of flight. Use of floating robotic systems in environmental monitoring and ecosystem research is only possible in conditions of relatively «soft» wave climate of the coastal zone.

For these purposes, there are special amphibians such as remote-controlled vehicle Surf Rover [Daily, William R., Mark A. Johnson, and Daniel A. Oslecki. «Initial Development of an Amphibious ROV for Use in Big Surf.» Marine Technology Society 28.1 (1994): 3-10. Print.], mobile system MARC-1 [«The SPROV'er.» Florida Institute of Technology: Department of Marine and Environmental Systems. Web. 05 May 2010.].

The paper describes methodological approaches to the selection of the design parameters of a new system.