

REMOTE ENVIRONMENTAL MEASURING UNITS

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ABSTRACT

There are civilian and military justifications for the development and commercialization of free swimming survey platforms which may be carried and operated by one person. To be effective, these platforms must be capable of characterizing the spatial and vertical variability of the physical environment beneath the surface of the water. There is therefore a need to develop low risk, affordable, underwater vehicles which are easily reproduced and which provide effective solutions, but whose loss is not an economic catastrophe. Research aimed at quantifying cause and effect relationships and predicting long term trends in coastal, inland and global marine processes will benefit from such systems. One important aspect of such research is the development of coastal ocean modeling and data assimilation computer programs which permit hind-casting and forecasting of circulation patterns in coastal regions. An affordable system of vehicles, which will permit ground truthing of remotely sensed data and the rapid measurement of vertical distributions beneath the surface, will support the use of these computer programs in characterizing remote coastal regions with a minimum investment. Once operational, these models may be used in support of both military and civilian objectives.

A system of Remote Environmental Measuring Unit(s) (REMUS) is intended to provide such a capability. The REMUS concept includes a number of small, low cost, free swimming vehicles which may be operated jointly or independently. They offer an appropriate technology for gathering data in the coastal and open ocean. Operations in the open ocean may be conducted from large or small ships of opportunity as well as from long term seafloor observatories such as Rutgers' LEO-15, which operates at the end of an electro-optic cable buried in the seafloor. Coastal and inland operations may be conducted from a shore station or a pier side location, as well as from a small boat. Since the vehicle weight will not normally exceed 40 kilograms, it is envisioned that the vehicle system may be transported to the site of interest in a compact car and set up and operated by one person.