

Future technologies for observing the ocean – from the surf zone to the deep ocean

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Presently there is a shift in ocean observing technologies from instruments that require a considerable amount of human intervention to more autonomous ones. The new / future generations of ocean observations enable scientists to collect data in otherwise under sampled regions. Examples of such technologies are Argo floats, autonomous surface and subsurface vehicles and Smartfins. In a recent case study Morris & Lamont (2019) used high resolution Argo float profiles to sample the continental shelf along the east coast of South Africa. Similarly the Gliders in the Agulhas (GINA) project uses autonomous surface and sub-surface gliders to collect high resolution data between Richards Bay and Port Elizabeth (Krug, Swart, Hermes; 2018). Even though this region is critical to understand due to its importance for local weather, transport, due to complex weather and ocean conditions, carrying out observations in this region is notoriously difficult due to the very strong current shear. Even though the large majority of coastal citizen spend hours on beaches every week around the world, the surfzone is arguably the least understood region of the ocean. This is largely due to the forceful nature of waves, complex and short lived dynamics, yet surfers spend hours in the surf zone every day. Smartfins can be used to change this. Smartfins are a relatively new technology that equips surfers with a surfboard fin that is capable of collecting a range of data. Scientists can equip surfing communities with Smartfins to autonomously collect data while they surf. In doing so local communities will become more interested in the ocean and perhaps create a sense of responsibility and environmental awareness. Some key results around Argo floats, surface drifters and glider work on the East coast of South Africa are presented here as well as future potential uses of new equipment such as the Smartfin.