In recent years, persistent autonomous operations have become a key area of interest for marine robotics researchers. As hardware costs have plummeted, sensors measuring various oceanographic properties have proliferated and the use of robotic platforms within the ocean science community has increased, the need for increased autonomy to perform tasks over large spatial and temporal durations. The challenge in doing so, is particularly severe in the context of the marine environment however, and especially for robotic assets to be observable and communicable over space and time. Over and beyond making time-series measurements marine robots have demonstrated their capability to respond to episodic events, perform targeted sample collection, track dynamic phenomenon in rough coastal environments and make quasi-synoptic observations in the meso-scale.

However, there continue to be significant challenges to marine robotic operations. While commercial deep-water oilfield inspection with autonomous vehicles is now a commercial reality, fielded robots continue to rely heavily on accurate a priori models of the subsea assets and expose limited capabilities for autonomous decision making. Most autonomous vehicles in the marine environment are limited to preplanned missions, or to limited forms of autonomy involving script switching and re-parametrisation in response to pre-programmed events. Realizing the persistent autonomy that users in the ocean increasingly demand is involving a greater capability in understanding sensed events to detect failure and error, and more capable task planning approaches that can adapt behaviour and control in novel ways.

Topics of interest include, but are not limited to:
- Autonomous long-term navigation, localization and SLAM
- Automated dynamic re-planning, planning under uncertainty
- Semantic-based world modelling, probabilistic approaches in ontologies
- Architectures for long-term autonomy
- Robust learning techniques
- Probabilistic graphical models
- Bio-inspired and bio-mimetic approaches
- Multi-vehicle cooperation potentially in multiple domains (air, surface, underwater)

In this special issue of Autonomous Robots journal, we invite:
Research papers to report innovative work in the field (up to 20 pages)
Applied research case-studies to analyse industrial needs, current states and needs for current and future operations (up to 20 pages)

Systems which exhibit these novel techniques should either be used on real-world marine robots, field experiments or demonstrations or authors should clearly demonstrate how they would transition such systems to the real world.

For more information, contact the guest editors at: auro-marine@googlegroups.com