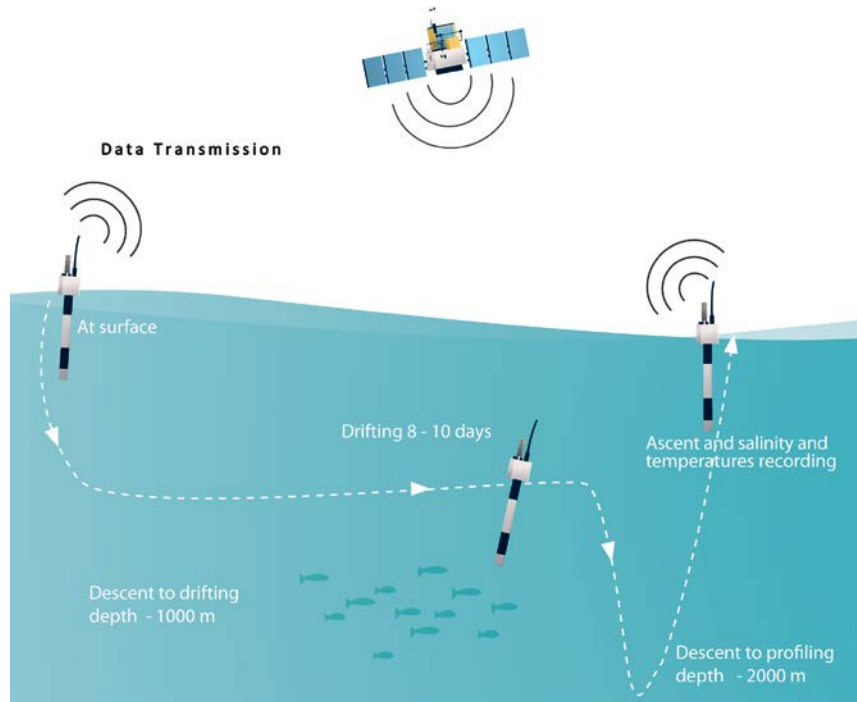


More on Profiling Floats...

What's an Argo float?

The Argo float is an autonomous instrument of subsurface which measures the temperature and salinity in the heart of the oceans.



The float is programmed in advance and is deployed from research vessels or ship of opportunities (deployments from plane are also possible). Then it starts to cycle (a typical duration for the cycles is 10 days, but it can be adapted depending on where the float is deployed), during several years, until exhaustion of its energy. Each cycle breaks up into five steps: a descent towards the immersion of instruction to 1000m (usually – can be adapted too), then a drift fwith the ocean currents, followed by a dive until the immersion of (usually) 2000m. Then it starts its ascent towards surface by carrying out its measurements. Once emerged, it transmits its data via satellite before setting out again for a new cycle.

How does an Argo float work?

In order to dive, the Argo float uses the Archimedes' principle. It implements a mechanism of modification of its volume, its constant mass remaining. The system functions thanks to a bladder and a reserve of oil. The deflation of the bladder, via an hydraulic actuator, makes the float sink and the reverse makes it ascent. The only energy used is the one of the pump that enables the oil to move from the inside reservoir to the outside bladder (ascent) and vice versa (descend). The sensor is located in the upper part of the float. Salinity is deduced from measurements of conductivity, temperature and pressure. The data transmission to ground mainly uses the Argos data collection and localisation satellite system. Iridium system is used when more data need to be transmitted.

How the settling occurs for such equipment?

The float is completely autonomous and is developed according to a methodology of rigorous quality assurance. The phases of design and tests are very thorough. The traditional operating processes and ranges are taken into account. Low battery consumption, the control of materials, the precision of the sensor and stability in time are essential parameters. The development requires characterizing perfectly the embarked software, the performances and the limits of the material. Tests in basin and hyperbaric chamber are the ultimate tests. The **three principal floats** used in the Argo programme are the APEX, SOLO (USA) and Provor, developed by Ifremer with the SME NKE Instrumentation who ensures its manufacturing and marketing. A new version of the Provor float called Arvor is operational since mid-2008, lighter and easier to deploy. The German company Optimare also developed the NEMO-floats based on the successful design of the SOLO-floats. The technology of all types of floats is continuously evolving, with developments to provide multi-sensor (e.g. O₂, biology) capabilities, a capacity to go deeper in the ocean or to operate in sea-ice environments

