

Research Station and Observing Network

Research on the waters surrounding Korea also plays an important role in relation to the nation's territory. Korea has installed its own Ocean Observing Network (KOON) consisting of tidal stations, ocean stations, ocean buoys, surface currents stations, and an ocean research station. All these stations collect, analyze, and release various collected data related to the tides, water temperatures, wave, ocean currents, and ocean weather. This information has been used for the protection of coastal environment and the maritime safety management. The Ieodo Ocean Research Station was installed to fulfill the scientific research purposes of providing real-time maritime and meteorological information, forecasting typhoons, and discovering characteristics of climate change and oceanic environments in the Northwest Pacific. The station is also a powerful symbol of Korea's interest in the Ieodo area.

Construction of the Ieodo Ocean Research Station, Korea's first integrated ocean research base, was completed on June 11, 2003. Built on top of a submerged rock 40 meters deep, the gross floor area of the station is 1,320 m²; its altitude above sea level is 36 m and its full height from underwater rock is 76 m. The Ieodo station (32° 07' 22.63" N, 125° 10' 56.81" E) is located 149 km southwest of Marado, Jeju, Korea; 276 km west of Japan's Tori-Shima (鳥島); 287 km northeast of China's Sheshan Dao (余山島). The purpose of the Station is to provide oceanic data by observing the constantly varying conditions of the ocean, weather, and its surrounding environment. In particular, since more than 60% of the typhoons that landed on the Korean Peninsula pass through the Ieodo Ocean Research Station, the station serves a crucial role in the observation, data collection, research, and forecast of typhoons. Additionally, it functions as a lighthouse that secures a safe passage of vessels, and as a frontier base for search and rescue efforts in the event of marine accidents. It is an unmanned oceanic research station with no stationed workers. It depends on the ever-abundant wind and solar power as the primary source of energy. Observed data are not only stored in the station's server, but are communicated

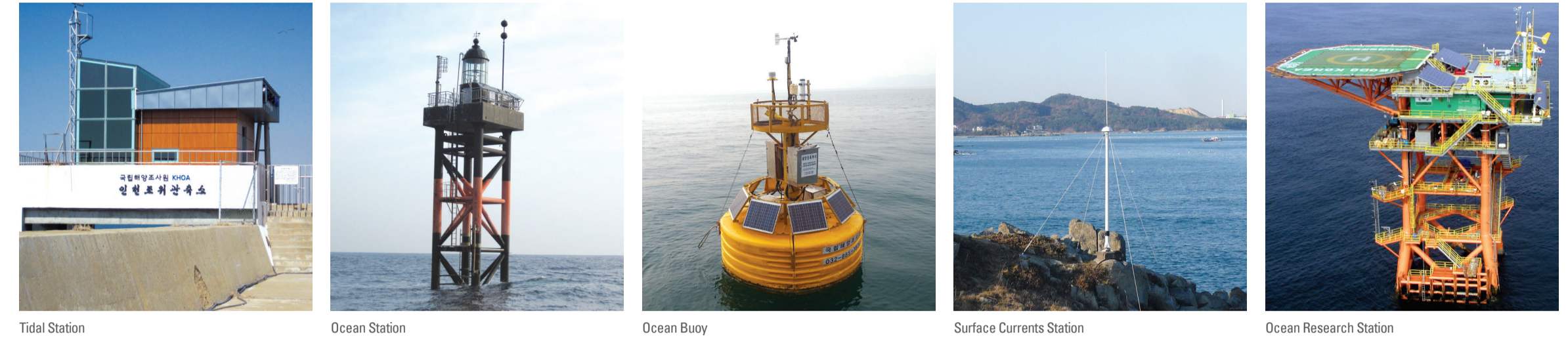
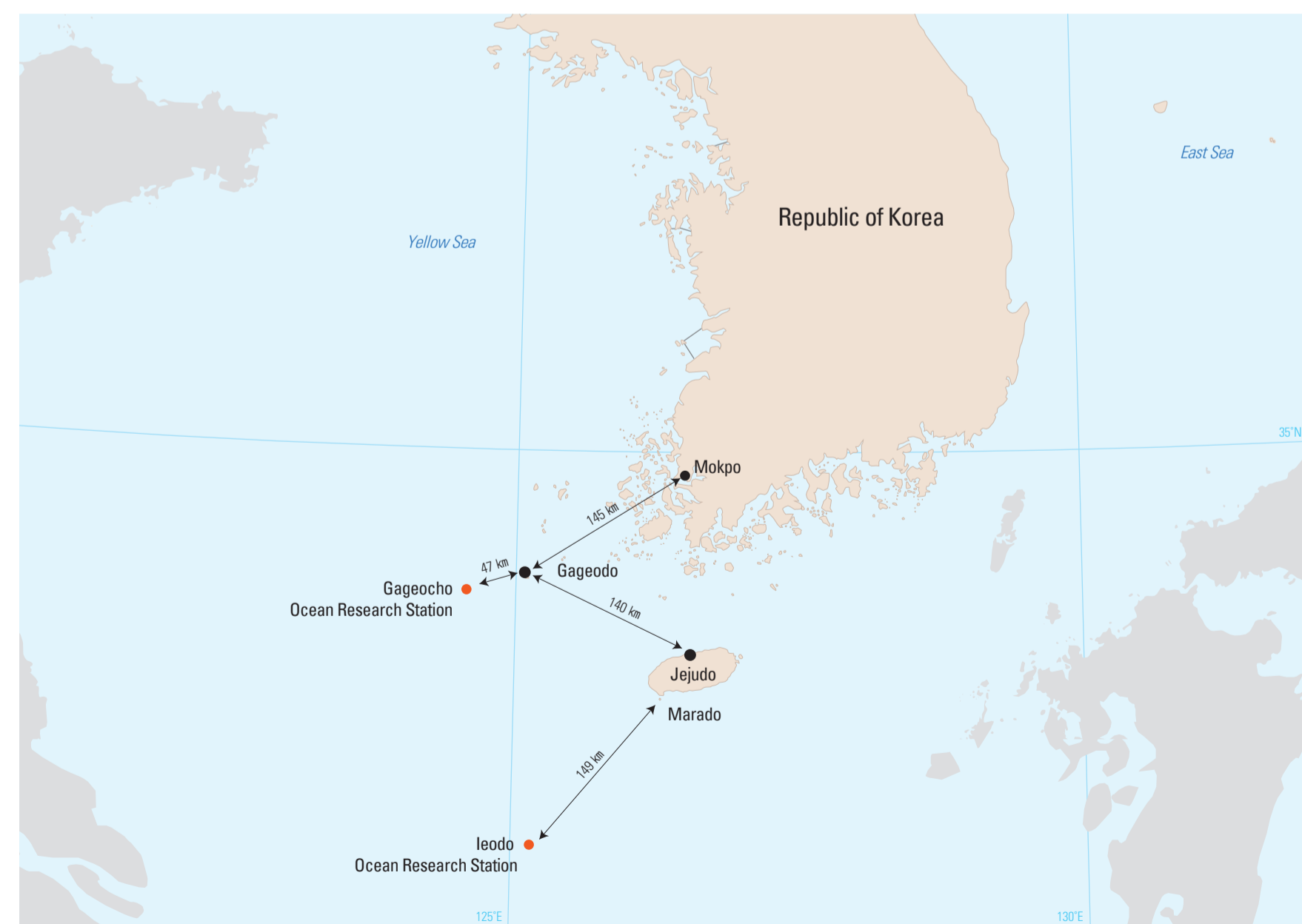
in real time, via satellite, to research facilities on the peninsula. As of 2014, the Ieodo Station is operated by the Korea Hydrographic and Oceanographic Administration (KHOA).

The Gageocho Ocean Research Station was completed on October 13, 2009. Built on top of a submerged rock 25 meters deep, the gross floor area of the station is 286 m²; its altitude above sea level is 31 m and its full height from underwater rock is 46 m. The Gageocho station (33° 56' 30.96" N, 124° 35' 34.23" E) is located 47 km west of Korea's Gageocho

Island. Its floor space is less than a quarter of that in the Ieodo Station, but its technologically advanced systems make it ideal to serve as an important remote research station. The Gageocho Station plays the role of supporting a diverse range of research and data collection activities with observations on the atmosphere and oceanic conditions. It also supports the relevant oceanic industries such as fisheries, marine transportation, and marine leisure activities by disseminating real-time oceanic and meteorological data via the Internet. In addition, it contains a warning

system that can reduce the damage caused by severe storms through its accurate oceanic and meteorological forecasts from the frontier of the nation before such storms hit the peninsula. It is also an unmanned research station with no stationed staff. Like the Ieodo Station, it harnesses the abundant wind and solar power as its operational energy. Observed data are not only stored in the station's server, but also broadcasted in real time via satellite. Currently, the Gageocho station is operated by the Korea Institute of Science & Technology (KIOST).

Ocean Research Station of the Gageocho Station and Ocean Research Station of the Ieodo Station



The Korea Ocean Observing Network (KOON) is a group of instruments and infrastructures designed to effectively manage and monitor oceanic conditions within Korea's sovereign marine areas. It consists of tidal stations, ocean stations, ocean buoys, surface currents stations, and an ocean research station. Oceanic data collected through the Network include tidal height, water temperature, salinity, wind speed, wind direction, current direction, current speed, and wave height. The collection and analysis of ocean data have enhanced the understanding of Korea's jurisdictional sea area and have improved national capability for marine utilization, development, preservation, and climate change and disaster mitigation efforts. The construction and operation of the KOON also has been associated with the building of the ocean surveillance infrastructure for increasing a maritime defense force. These datasets are disseminated through the Korea Ocean Observing and Forecasting System (KOOFS) website. The results of scientific analyses based on these data are compiled into newsletters, yearly white papers, and abnormality reports, which are then released to 200 relevant authorities.

There has been significant progress in the study of space and geodesic survey. For the purpose of navigation and geodesic survey, GNSS (Global Navigation Satellite

System) has been operated by eight governmental institutions, such as the National Geographic Information Institute, the Ministry of Oceans and Fisheries, Korea Meteorological Administration, Korea Cadastral Survey Corp., Korea Astronomy and Space Science Institute, Korea Institute of Geoscience and Mineral Resources. To measure accurate locations of control points and the movement of the Earth in space, VLBI (Very Long Baseline Interferometry) technology has been used. There are two kinds of VLBI stations operated for the purpose of research (in Seoul, Ulsan, and Jeju) and geodesic survey (Sejong Metropolitan Autonomous City).

Korean research in space has made significant progress since 1990s. To date, 7 Science and Technology Satellites, 4 Multi-Purpose Satellites, 1 Geostationary Orbit Satellite have been launched. Eleven satellites, including 5 under development, will be launched until 2020. In addition, three scientific rockets have been launched to gain experience in launching satellites. A space center was constructed on Naro-do in Goheung-gun, Jeollanam-do in 2009. A KSLV-1 (Naro) rocket equipped with a 100 kg-class satellite was successfully launched in 2013. An air launch vehicle that carries a 1,500 kg-class satellite is planned for launching by 2020.



Korea Ocean Observing Network



Permanent GNSS Stations

