Using AIS data from ships for MSP

Automatic identification systems (AIS) are mandated by the International Maritime Organization to be operational on many types of ships; generally speaking, any cargo ship of 300 gross tonnes or more, and fishing vessels over 15 feet long. AIS broadcasts a ship's identity, position, speed, and other variables as frequently as every other second, and at most every six minutes. Between VHF radio and satellite networks, ships can be monitored in real-time. Several websites offer real-time AIS data for free, making it an easy addition to a marine spatial planning process.

Most European countries with a maritime spatial plan utilized AIS data in their decision-making, for instance the BaltSeaPlan and ADRIPLAN planning efforts. Layering AIS data allows density maps to be produced for shipping traffic helping to illustrate areas that see the most passing ships and those which are infrequently sailed. As time records are included in AIS observations, these maps can show diurnal and seasonal changes in traffic. Commonly, this data is used to designate shipping lanes (i.e. preferred routes for shipping traffic).

AIS data is often used to show conflicts in maritime space, either between different user groups or important marine mammal areas, for example. However, since only certain classes of ships are required to have AIS, many user groups are not represented in this data: namely small-scale and recreational fishers, and pleasure craft.

AIS data must be processed before it can be used in a GIS analysis – though preprocessed data can be downloaded from many providers. Typically, this means removing outliers like points that show up on land. After the outliers are removed, lines can be drawn between sequential points, thus making the AIS data ready for analysis in a GIS program.

Overlapping lines can be turned into heat-maps, where areas of dense traffic appear as darker lines compared to the lighter-colored areas of infrequently-sailed seas. Other common maps highlight the types of ships, allowing planners to differentiate between cargo-traffic lanes and routes that passenger ships typically travel.

Fishing activity can also be implied from AIS data. Common fishing grounds can be discerned from the behavior of fishing vessels. When simply traveling to and from fishing areas, the vessels typically go in straight lines. But, when they are actively fishing, they typically travel at a specific speed or in a zig-zag pattern. Fishing effort and intensity can be estimated from the tonnage and horsepower of the boat.

Infrastructure can also be planned around AIS data: for example, one would not want to install an undersea cable where vessels typically anchor. Ships at anchor, and their anchor point, can be discerned from the predictable patterns anchored-vessels have on the water.