

# REMOTE SENSING IN MARINE FISHERIES - INDIAN EXPERIENCE

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Remote sensing is a new and rapidly developing science that is finding applications in diverse areas like agriculture, meteorology, forestry, hydrology, fisheries etc. in the country. The associated technology covers a wide range of techniques that enable features and properties of an object or an area to be measured without the instruments coming into direct contact with particular object or area. Observations using remote sensing instruments are normally conducted from airborne and space platforms. Advances in space technology have given a new dimension to remote sensing and its applications especially for gathering information about the earth's natural resources. Detecting something from a distance is the literal meaning of the expression remote sensing although nowadays it is used in a restricted sense, namely, the detection through electromagnetic waves only.

Credit should go to the scientists of erstwhile FAO/UNDP Pelagic Fisheries Project who attempted for the first time in India the application of remote sensing to marine fisheries. They succeeded in direct spotting of fish schools and their quantification by aerial surveys and vessel surveys during the years 1972-74. During

1980 National Remote sensing Agency (NRSA) and scientists of CMFRI succeeded in mapping the Cochin coastal area for chlorophyll distribution making the way for modern marine remote sensing. This study clearly demonstrated the feasibility of colour remote sensing and quantification of chlorophyll from ocean colour distribution.

During 1980-84 three major organizations, the Space Application Center (SAC) Central Marine Fisheries Research Institute (CMFRI) and Fishery Survey of India (FSI) joined together to collaborate in the Joint Experiment Programme (JEP) for marine fisheries. Several experiments were made to use the data from several U.S. satellites like Landsat, Nimbus-7 etc. The main objectives of the experiments were to identify suitable sensor parameters such as optimum special bands, sensitivity, special resolution in the context of the Indian Remote Sensing Satellite Utilization Programme (IRS-UP). Fish resource surveys were made to develop methodologies to extract relevant information from remotely sensed data for resource estimation. Modeling experiments were conducted during the period to acquire data from airborne sensors, space borne sensors and to correct them with the sea truth data collected synchronously. The data from the coastal zone colour scanner (CZCS)

on board Nimbus-7 was used for making chlorophyll distribution maps.

During 1985-89 under IRS utilization programme several experiments were made in different regions using various technologies in identifying several parameters with varied sensors. An attempt has been made to validate the remote sensing technique for locating potential fishing grounds off the Gujarat Coast using data from NOAA-AVHRR (Advanced Very High Resolution Radiometer), which has the capability of covering a large area. Thermal fronts were delineated from the temperature distributions, which are favourable for fish aggregations. The Gujarat experiment using remote sensing techniques yielded a substantially high catch of quality fishes, even when the fishing season traditionally

being observed was over. With this success fishery potential zones maps were prepared for different maritime states and supplied through fax messages.

Features such as chlorophyll distribution, ocean temperature, current boundaries, and ocean fronts can be detected in satellite imagery. Scientifically planned data acquisition on these parameters useful for understanding the seasonal availability and areas of concentration of oceanic fishes such as tunas is an urgent need. It is hoped that the recent advanced techniques of remote sensing will enable locating the movement of fish schools and their quantification in a more precise manner for better harvesting and management in future.