

Chapter 10

Role of Remote Sensing in Potential Fishing Zone Forecast

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ABSTRACT

Forecasting of Potential Fishing Zone (PFZ) is considered as economically and environmentally significant towards ensuring profitable base of economy and planning for sustenance of existing fishing pool. Changes in environmental conditions affect the distribution, abundance and availability of fish. The traditional sampling approaches for PFZ identification using boats and vessels are not only costly and time consuming but practically absurd considering the vastness of seas and oceans. In this chapter importance of alternative but effective methods of airborne and satellite remote sensing has been given. The chapter elucidates the factors for PFZ identification like thermal condition in sea controlling its thermal circulation, chlorophyll-a concentration estimated from ocean color dynamics, etc. Tools/system to prepare PFZ advisories and also the platforms for dissemination of the same, have been illustrated based on Indian scenario.

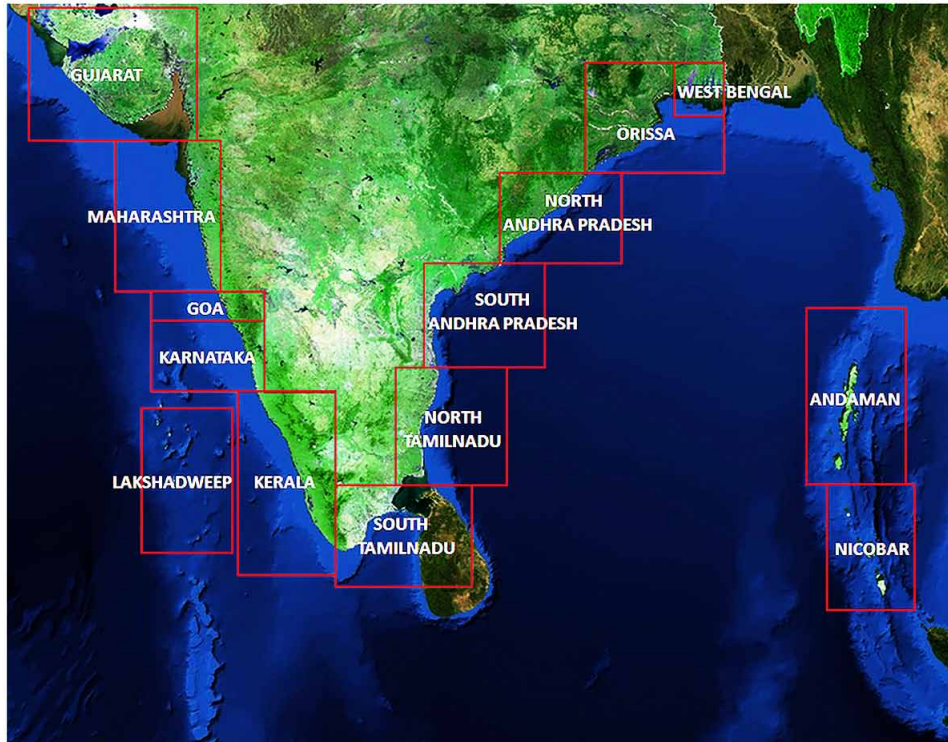
INTRODUCTION

Coastal environment plays a crucial role in India's economy in terms of its resource base, productive habitat and wide range of biodiversity. India has a long coastline of 8129 Km. and Exclusive Economic Zone (EEZ) of 2.5 million sq. Km. (Figure 1) (Subramanian et al., 2014). Against the harvestable potential of 3.93 MT, India's annual marine fisheries production is about 2.94 MT (Anon, 2008). India has increased its share in world fish production from 3.2% to 4.2% during last decade. The dynamic coastal fisheries sector has undergone considerable changes over the years and support livelihood of millions of people (Nammalwar, Satheesh, & Ramesh, 2013).

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Figure 1. Coastal stretch of India

(Source: http://www.incois.gov.in/MarineFisheries/TextDataHome?mfid=1&request_locale=en)



As far as fishing is concerned, the seasonal variation of stocks in different areas assumes great importance in developing as well as managing coastal fishery sector. Maximum fishes are harvested by directing fishermen to most profitable fishing grounds through forecasting. Some commercial species are sensitive to environmental changes and undertake migration to the favorable areas (Choudhury et al., 2007; Hela, 1960; Laevastu, 1984; Laevastu & Larkin, 1981; Laevastu & Rosa, 1963). However, nearly 80% of the total fish stocks of the world are now either fully exploited or over exploited (FAO, 2009). Thus, effective monitoring and management of the marine resources are essential for its sustainable use. According to Nammalwar et al. (2013), conventionally potential fishing grounds are located by the way of:

- Fishing in traditionally known fishing areas.
- Locating productive fishing grounds through breaks in color.
- Presence of large number of sea birds over an area.

The traditional sampling research approaches using boats and vessels are both costly and time consuming. Considering the vastness of seas and oceans it is very difficult to study the entire ecosystem. With the advent of remote sensing it has become possible to monitor the global oceans synoptically at regular interval. For example, Sea Surface Temperature (SST) and chlorophyll concentration information derived from the satellite images have been widely used to delineate marine ecological provinces with similar physic-chemical and biological forcing. These time and space variant ecological provinces

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