Contents

Sr. No.	Particulars	Page No.
Chapter 1.	Introduction	1
1.1	Background	2
1.2	Objective of the study	5
1.3	Scope of present investigations	6
1.4	Thesis Flow	7
Chapter 2.	Literature Survey	8
Chapter 3.	Materials and Methods	20
3.1	Study Area	24
3.1.1	General description of study area	24
3.1.2	Hydrography of study area	26
3.1.3	Status of Marine fisheries of Gujarat	28
3.1.4	Marine fish production of Gujarat	30
3.2	Selection of satellite data	33
3.2.1	Time, Space and Fish Scales consideration – A biological perspective	33
3.2.2	Description of observational requirement and capabilities - remote sensing perspective	39
3.2.3	Capability of Satellite Sensors	44
3.3	Satellite data used	45
3.3.1	Optical sensors for sensing ocean color	46
3.3.2	Thermal sensors for sensing temperature	47
3.4	Fish catch data used	48

3.5	Methodology	49
3.5.1	Satellite data analysis	49
3.6	Interpretation chlorophyll and SST images	56
3.7	Fish catch data analysis	57
3.8	Impacts of surface wind on oceanographic features	58
3.8.1	QSCAT-SeaWinds data analysis	59
3.8.2	Feature tracking and shift analysis	60
3.8.3	Wind-driven currents and Mass transport	61
3.9	Secondary production modeling using remote sensing data	61
Chapter 4.	Results and Discussion	64
4.1	Satellite Observations of some oceanographic events/features	69
4.1.1	Upwelling	69
4.1.2	Eddies and rings	73
4.1.3	Oceanographic fronts	77
4.2	Synergistic analysis of oceanic features	80
4.3	Observations of Biological and physical coupled processes in the sea	85
4.3.1	Signatures of bio-physical processes	86
4.3.2	Application of bio-physical processes for fishery resources	87
4.4	Identification of PFZs	89
4.4.1	Image interpretation key for identification of PFZs	90
4.4.2	Selection Criteria	93

4.5	Habitat of fishery resources and link with satellite-derived in PFZs	96
4.6	Patterns of variability in fishery resources in PFZs and other areas	101
4.7	Fishing operations data analysis - a remote sensing perspective	107
4.8	Impacts of surface wind on oceanographic features	110
4.8.1	Shift in the features	111
4.8.2	Water-mass Transport	112
4.9	Remote sensing of secondary production	113
4.9.1	Copepods egg production modeling using RS data	113
4.9.2	Computation of Secondary production	119
4.9.3	Model validation approach	120
Chapter 5.	Summary and Conclusions	122
5.1	Salient features of the research findings	123
5.2	Future Scope	128
	References	131