

Oceanography for Geographers

*R. C. Sharma
M. Vatal*

Contents

CHAP.	PAGE
1. Definition and Scope of Oceanography	... 1
Place in Geography 1	
Growth and historical development 2	
Oceanography in India 6	
Scope and importance 9	
Oceanography and other Sciences 11	
2. Land and Water Hemisphere	... 13
Distributional pattern of land and sea 13	
Theories of the origin of ocean basins 15	
Extent of the oceans 23	
3. The Depth of Oceans	... 30
Hypsographic or hypsometric curve 31	
Depth zones of ocean bottom 34	
4. Submarine Canyons	... 41
Distribution of submarine canyons 42	
Theories of origin of submarine canyons 45	
5. Bottom Relief of the Oceans	... 71
Atlantic Ocean 71	
Seas adjacent to the Atlantic 77	
Indian Ocean 80	
Arctic Ocean 84	
Pacific Ocean 86	
Marginal Seas 90	
6. Ocean Deposits	... 91
Source and nature of deposits 91	
Classification according to location of deposits 99	
Other classifications 103	
Transportation of marine sediments 104	
Deposition of marine sediments 106	
Distribution of sediments 108	
7. Coral Reefs and Islands	... 111
Condition of growth 111	
Types of coral reefs 113	
Structure of coral reef 120	
Theories of origin 123	

CHAP	PAGE
8. Temperature of the Oceans	... 139
Source of heat and insolation	139
Process of heating	140
Process of cooling	145
Heat budget of the oceans	148
Distribution of temperature on oceans	150
Ice in the sea	164
9. Salinity in Oceans	... 168
Composition of sea water	168
Controls of salinity	170
Distribution of salinity	173
10. Density of Sea Water	... 182
Control of density	182
Distribution of density	183
Structure of oceans	186
Distribution of water masses	188
11. Dynamics of Ocean Water	... 193
Sea movement recording instruments	193
Waves	194
12. Tides	... 200
Tide producing forces	201
Types of tides	208
Theories of tides	215
Tide tables and tidal predictions	227
Effects of tides	233
13. Dynamics of Ocean Currents	... 234
Factors controlling currents	234
Factors modifying currents	249
General pattern of the currents	253
14. Currents of Atlantic Ocean	... 254
Currents in the equatorial region	254
North Atlantic currents	259
Seas adjacent to North Atlantic	268
South Atlantic currents	272
15. Currents of Pacific Ocean	... 275
Currents in Central Pacific	275
North Pacific currents	280
South Pacific currents	283

CHAP.	PAGE
16. Currents of Indian Ocean and other Seas	... 287
North Indian Ocean	287
Seas adjacent to Indian Ocean	291
Polar waters	292
Arctic Ocean	294
17. Man and Oceans	... 295
Oceans and climate	295
Oceans and food resources	297
Ocean and politics	299