



Table of Contents

Introduction

1.0 How the Sun Causes Weather.....	1
1.1 The Atmosphere	
1.2 The Troposphere, Tropopause, and Stratosphere	
1.3 How the Sun Causes Weather	
1.4 The Earth's Heat Budget, and How It Is Balanced	
1.5 Why Is the Sky Blue, Daddy?	
2.0 What Causes the Wind To Blow?	5
2.1 What Is Pressure?	
2.2 Measurement of Barometric Pressure	
2.2.1 The Mercury Barometer	
2.2.2 The Aneroid Barometer	
2.3 High and Low Pressures—Airflow and Circulation	
2.4 Land and Sea Breezes	
2.5 High and Low Pressure Patterns	
2.6 Buys-Ballot's Law	
2.7 The Beaufort Scale	
2.8 Marine Weather Warnings	
2.9 Winds and Waves	
3.0 Water in the Atmosphere	13
3.1 The Different States of Water	
3.1.1 Water Vapour	
3.1.2 Liquid Water	
3.1.3 Ice	
3.2 The Hydrologic Cycle	
3.3 Precipitation	
3.3.1 Rain	
3.3.2 Drizzle	
3.3.3 Snow	
3.3.4 Freezing Rain	
3.3.5 Freezing Drizzle	
3.3.6 Hail	
3.4 Fog	
3.4.1 Radiation Fog	
3.4.2 Dew or Frost?	
3.4.3 Advection Fog	
3.4.4 Frontal Fog	



- 3.4.5 Upslope Fog
- 3.4.6 Smog
- 3.4.7 Play it Safe in Fog

4.0 Clouds—The Signposts of the Skies21

- 4.1 Clouds and Cloud Classification
- 4.2 Cloud Shape
- 4.3 Cloud Height
- 4.4 Cloud Types
 - 4.4.1 High Clouds
 - 4.4.2 Medium Clouds
 - 4.4.3 Low Clouds
 - 4.4.4 Clouds of Vertical Development
- 4.5 Other Cloud Types
- 4.6 Vapour Trails, or Contrails
- 4.7 Low Clouds as Weather Indicators

5.0 Fronts and Frontal Weather27

- 5.1 What Is a Front?
- 5.2 Warm Fronts
- 5.3 Weather Patterns Associated with Warm Fronts
 - 5.3.1 Precipitation
 - 5.3.2 Pressure
 - 5.3.3 Temperature
 - 5.3.4 Wind
- 5.4 Cold Fronts
- 5.5 Weather Patterns Associated with Cold Fronts
 - 5.5.1 Precipitation
 - 5.5.2 Pressure
 - 5.5.3 Temperature
 - 5.5.4 Wind
- 5.6 Stationary Fronts
- 5.7 Frontal Depressions
- 5.8 Occlusions
- 5.9 TROWAL
- 5.10 The Jet Stream



6.0 Thunderstorms and Tornadoes	35
6.1 Thunderstorms	
6.2 Equilibrium of the Atmosphere—Stability and Instability	
6.3 What Causes Air To Rise?	
6.4 Air Mass Thunderstorms	
6.4.1 The Development Stage	
6.4.2 The Mature Stage	
6.4.3 The Dissipating Stage	
6.5 Cold Front Thunderstorms	
6.6 Lightning	
6.7 Thunder	
6.8 What Can We Do To Be Safe During a Thunderstorm?	
6.8.1 Before You Set Out	
6.8.2 If You See a Thunderstorm Coming	
6.8.3 During the Storm	
6.9 Tornadoes	
6.9.1 Tornado Formation	
6.9.2 Tornado Characteristics	
6.9.3 Tornado Precautions	
6.10 Waterspouts	
7.0 Forecasting the Weather	43
7.1 Forecast First—Sail Later	
7.2 Weather Forecasts	
7.3 Sources of Weather Forecasts	
7.4 Know Your Own Boating Area	
7.5 Weather Log	
7.6 Your Own Forecast!	
7.7 Some Weather Trivia	
In Conclusion	47
Glossary	49
Appendix A: Conversion Tables	55
Appendix B: Example of “Station Model”	56
Appendix C: Beaufort Wind Scale	57
Appendix D: Weather Log.....	58
Appendix E: The MAREP Weather Programme	59
Appendix F: Wind/Barometer Forecasting Table	60
Bibliography	61
Index	63

