

Contents

Preface: What is a flood?	vii
Introduction	xi
HOW WATER MOVES	1
Where floods happen	1
<i>El Niño</i>	7
Evaporation, precipitation, and transpiration	9
<i>Partial pressure and vapor pressure</i>	14
<i>Humidity</i>	16
How the land drains	17
Rivers	24
<i>Why it rains more on mountainsides</i>	25
<i>Kinetic energy</i>	28
Floodplains and meanders	31
<i>The Bernoulli effect</i>	35
Flash floods	37
RAINSTORMS	43
Storms and cloudbursts	43
<i>Lapse rates and stability</i>	44
<i>Latent heat and dewpoint</i>	46
Thunder and lightning	50
<i>Charge separation</i>	53
WHEN THE SEA RISES	58
Tsunamis	58
<i>Tsunami Warning System</i>	65

Tides	65
<i>Laws of motion</i>	66
<i>The Coriolis effect</i>	71
Tidal surges	73
<i>Air pressure—highs and lows</i>	74
COPING WITH FLOODS	78
Monsoons	78
<i>Intertropical convergence and the equatorial trough</i>	79
Aquifers, springs, and wells	84
Vegetation and natural drainage	91
FLOODS AND AGRICULTURE	98
The Nile floods and the Aswân Dams	98
Wet rice farming	106
THE COST OF FLOODS	112
Coastal erosion	112
<i>Glacioisostasy</i>	113
<i>Isle of the Dead</i>	114
Saltwater infiltration	120
<i>Osmosis</i>	120
Flood damage	125
Floods and soil erosion	131
<i>Soil erosion</i>	134
Floods of the past	137
PREVENTION, WARNING, AND SURVIVAL	145
Land drainage	145
Wetlands	150
Levees	155
Dams	161

Canalization	168
Flood prediction	171
Safety	175

Appendixes

SI units and conversions	180
Prefixes and SI units	181

Bibliography and further reading	182
----------------------------------	-----

Index	189
-------	-----