

coverage of data collection, processing, and correction for image-forming sensors is very strong, there is far less coverage of the geometric corrections required for active sensors. Although there is considerable mathematical detail for the radiometric correction of sensors, there is little mathematical coverage and only a brief description — less than a page — of the equally necessary geometric correction of satellite radar altimetry and airborne or ground based radio echo sounding. Furthermore, the book does not cover the range of techniques used to carry out these corrections, but only refers to a technique that although widely used is not necessarily the best.

The book is well organised, with chapters on the various techniques available, image processing, physical properties of various aspects of the cryosphere, and then separate chapters for sea ice, freshwater ice, glaciers, and icebergs. Examples are indexed by place-name and by general region, enhancing their utility for workers in particular areas, and giving the general glaciological setting of the example.

Critically, there is both a comprehensive index and a wide-ranging bibliography. Both are essential to its use as a reference volume, and both are comprehensive in their coverage. The bibliography will certainly provide ample material for the reader who wishes to expand his or her understanding of any particular area.

Rees has provided a useful addition to the bookshelf of any glaciologist, and it will easily take its place alongside standards such as Paterson's *The physics of glaciers*. While there are some deficiencies in the range of topics covered, these do not detract from the utility of the book, and I anticipate that these omissions will eventually be covered in a second edition. (A.P.R. Cooper, British Antarctic Survey, High Cross, Madingley Road, Cambridge CB1 0ET.)

WILDLIFE AWARENESS MANUAL: ANTARCTIC PENINSULA, SOUTH SHETLAND ISLANDS, SOUTH ORKNEY ISLANDS. C.M. Harris (Editor). 2006. Cambridge: Environmental Research and Assessment. 136 p, illustrated, soft cover. ISBN 0-9552205-0-5. Free to qualifying polar libraries. Otherwise £15.00. doi:10.1017/S0032247406265999

This interesting little book is the first Wildlife Information Publication to appear under the auspices of the Polar Regions Unit of the United Kingdom Foreign and Commonwealth Office. The aim is to provide 'practical information on breeding wildlife (penguins, petrels, shags, fulmars, fur seals) colony locations...in the Antarctic Peninsula/South Shetland Islands/South Orkney Islands region. Information on scientific stations, protected areas and historic sites is also included. The manual is designed primarily to meet the needs of helicopter pilots, with orientation maps, photographs and summary information highlighting key wildlife and landing site information.'

The information presented is remarkably comprehensive. Some 130 locations are included and for each there

is a clear coloured map, at a reasonable scale, with contours, the location and type of the wildlife colonies, areas covered and uncovered by ice, the locations of any bases, areas where overflight/landing restrictions apply, Specially Managed and Specially Protected Areas, and helicopter approach and departure routes. In cases where there is a base in the area, there is an oblique aerial photograph with orientation, locations of any hazards (for example, aeriels or lattice masts), and the location of any helicopter pads with an indication of their size. Radio contact information is also provided where applicable. Each region, for example, Elephant and Clarence islands, has its own overall map with the individual locations marked on it. In the case cited, these are, Seal Islands, Elephant Island west, Elephant Island central, Elephant Island east/Cornwallis Island, Clarence Island, Aspland Island, and Gibbs Island. Continuing the example, for Gibbs Island we are informed that there are some 40,000 breeding pairs of Adélie penguins at 'several colonies mostly along the southern coast,' as well as some 10,000 southern fulmars breeding on Furse Peninsula, with 7000 east of The Spit and 2000 at the west of the island.

Sufficient has already been written in this review to make it apparent that this book is useful to a much wider constituency than the somewhat narrow one for which it is ostensibly intended. For example, it should be in the library of every expedition leader on board tourist vessels, of which there seems to be an exponentially increasing number in the region under consideration. The maps are excellent and are in a much more convenient format for instant use than the usual foldout versions. A good example is that of Antarctic Sound with all the associated, and very complex, islands, an area very frequently visited by such ships. Indeed, one might go further and suggest that passengers themselves could benefit from these maps as providing a convenient medium on which to mark the progress of their voyage. The maps of individual sites would be particularly helpful for briefing passengers before landing concerning what they might expect to find when they are ashore in particular locations and for indicating those areas to which access might be prohibited, and this reviewer intends to use the book for precisely that duty the next time he is in the Peninsula area. Indeed the book is much more appropriate for this purpose than some of the commercial publications that have appeared with the aim of satisfying that market.

The book has its idiosyncrasies, some of which might result from its Civil Service origin. The format is unusual in being that of a secretarial notebook. This is, however, convenient for a book that is intended for use in the field. There is no title page as such, the first text being the usual 'waiver' of responsibility statement with which everyone is so familiar in this litigious age. And one has to conduct fairly deep investigations before one discovers the name of the Editor. This only appears, in a minute font size, at the bottom of page 3 after the introduction, references, and acknowledgements. Many of the latter are directed to the helicopter crews of HMS *Endurance* who were

responsible for accumulating much of the information incorporated in the book. Only then does one arrive at the table of contents. That is immediately followed by Resolution 2 (2004) of Antarctic Treaty Consultative Meeting XXVII setting out 'Guidelines for the operation of aircraft near concentrations of birds in Antarctica.' However, some of the detailed maps have nothing under the heading 'Information Sources and Dates' and when there is a space at the end of a page we are sternly informed that this is left 'Intentionally blank.' One wonders if the average user would be brave enough to use these spaces for his or her own notes. A further oddity is that the same map is occasionally printed more than once, as in the case of Paradise Harbour, one copy of which appears above a photograph of Gabriel Gonzales Videla Station with another on the next, facing, page appearing above a photograph of Almirante Brown Station. The only difference between the two is that each has its own flight approach and departure directions. It seems odd that they could not appear on the same map. A yet more curious example is at the southwest corner of King George Island. Here, of course, the bases are almost on top of one another and the same map is used for the Marsh, Bellingshausen, Artigas, Great Wall, and the Vaclav Vojtech 'Eco' bases, again with the sole difference being the arrows indicating the flight directions.

There is at least one omission. The newly discovered emperor penguin colony on Snow Hill Island is not mentioned, but this might have been because it was discovered after the book was finished. It is to be hoped that this omission will be corrected in a future edition.

A further point is that some of the aircraft approach/departure directions seem a little inaccurate when compared with the arrows printed on the maps. However, in the introduction it is stated clearly that the guide is not intended to provide technical aeronautical information and that the indications given are simply to avoid any possibility of flying over concentrations of wildlife.

All dimensions are resolutely in Imperial measurements, no doubt arising from the book's purpose as a guide for aviation. And some of the notes are positively mysterious, at least to laypeople. For example, in the case of Seymour Island/Marambio Station, we are informed that the approach is in the sector between 'N and 090. BAH 230 (to pick up running rabbit).' Whatever that means!

To sum up, a very useful, well-presented, and interesting book. (Ian R. Stone, Scott Polar Research Institute, University of Cambridge, Lensfield Road, Cambridge CB2 1ER.)

GEOLOGY OF SOUTHEAST ALASKA: ROCK AND ICE IN MOTION. Harold H. Stowell. 2006. Fairbanks: University of Alaska Press. 140 p, illustrated, soft cover. ISBN-13: 978-1-889963-81-5. \$US19.95. doi:10.1017/S0032247406275995

The part of Alaska described in this book is one of the few coastlines in the world where coastal mountains adjacent

to the ocean include glaciers, or exhibit recent glaciation, and can thus be compared with the scenic beauty of southern Chile, New Zealand's South Island, and Norway. The area is very popular with cruise lines, many of which charter ships every northern summer through the 'Inside Passage.' Continental glaciation in North America began to retreat from southeast Alaska some 14,000 years ago, leaving behind spectacular evidence of the erosive qualities of glacier ice on the mainland and offshore islands. Relatively small Alpine glaciers are all that remain of this last major glacial period in Earth's history, when the thickness of ice in Glacier Bay was as much as 3000 feet (900 m).

The book is divided into eight chapters, with the first seven discussing the basics of geology that apply to the area (pages 1–58) and providing the setting for the last chapter (Regional Geology, pages 59–109), in which specific areas are described in detail. The remainder of the book includes notes (three pages), brief mentions of publications that pertain to the area described; a glossary (13 pages) of 120 geological terms that are used throughout the text; a bibliography (seven pages) of 66 entries; and an index (seven pages). A scan of authors in the bibliography illustrates the long-term study of the area by US Geological Survey geologists and colleagues. The first chapter covers the geographic setting of southeast Alaska, with the relatively warm ocean currents providing a moderate maritime climate: warm and moist air creating considerable coastal precipitation, and less on the eastern side of the mountains. The geographic area included in this book is generally from Ketchikan in the south, to Juneau, Haines, and Skagway in the north, spanning latitudes 54–58°N.

Chapter 2 — 'Glaciers, ice ages, and global change' — includes a description of the various types of glaciers (continental, Alpine, tidewater, for example), icebergs, and the probable causes of ice ages, with Milankovitch cycles (variations in the Earth's orbit) proposed as the most likely cause of Pleistocene ice ages. Numerous examples of glacial features and landforms exist in the area, exhibiting fjords, U-shaped valleys, cirques, arêtes, and striations.

Chapter 3, on plate tectonics, is a vital part of the book because of the role played by crustal movement through geologic time, with the Pacific Plate moving mainly northward in strike-slip motion against the North American plate, with a present rate of about 2.3 in yr^{-1} (5.8 cm yr^{-1}). The result over millions of years is a mixture of several different terranes, some of which are parts of volcanic island arcs that formed south of their current locations and moved north along faults before colliding with North America between 165 and 100 million years ago. Although these terranes and the general complexity of metamorphic geology take some thought to put things into place, the author has done a remarkable job of putting the processes into language for the general public to understand.

Chapter 4, on rock types, includes a basic classification of Earth materials, describing the most common