Book Reviews

Source: Journal of Coastal Research, 28(2) : 530-532

Published By: Coastal Education and Research Foundation

URL: https://doi.org/10.2112/11A-00019.1

Journal of Coastal Research	28	2	530	West Palm Beach, Florida	March 2012

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BOOK REVIEW

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Rip Currents: Beach Safety, Physical Oceanography, and Wave Modeling. Leatherman, S. and Fletemeyer, J. 2011. Boca Raton, Florida: CRC Press, 277p. ISBN 978-4398-3896-9. Hard Cover. US$119.00.

This is an interesting edited volume that grew out of the First International Rip Current Symposium held at Florida International University in Miami (February 17–19, 2010). The meeting was organized and chaired by the editors, who collected papers from presentations at the meeting to make up the book. There are 16 chapters in the book, which in a sense is really a proceedings volume. The chapters are as follows: (1) Future Challenges for Rip Current Research and Outreach; (2) Flash Rip Currents and Ocean Shoreline of Long Island, New York; (3) Rip Current Prediction at Ocean City, Maryland; (4) Analysis of Rip Current Rescues at Kill Devil Hills, North Carolina; (5) Methodology for Prediction of Rip Currents Using a Three-Dimensional Numerical, Coupled, Wave Current Model; (6) Surf Zone Hazards: Rip Currents and Waves; (7) Florida Rip Current Deaths: Forecasts and Statistics; (8) Remote Sensing Applied to Rip Current Forecasts and Identification; (9) Effectiveness of Panama City Beach Safety Program; (10) Meteorological Data Analysis of Rip Current Drowning; (11) Rip Current Hazards at Pensacola Beach, Florida; (12) Rip Currents in the Great Lakes: An Unfortunate Truth; (13) Beach Safety Management in Brazil; (14) Rip Current Hazards on Large-Tidal Beaches in the United Kingdom; (15) Tracing Sand Movement in Strong Japanese Currents; and (16) Rip Currents: Terminology and Pro-Active Beach Safety. These chapters bring much new and important information to the field of rip current research that in turn feeds beach safety and management issues. It is important to note, for example, that rip currents kill more people on average each year at U.S. beaches than hurricanes, tornadoes, or lightning as reported by the National Weather Service.

Most of the statistics relating to beach safety and rip currents in particular are shocking because the numbers are large and not well appreciated by the public. According to the World Health Organization, for example, more than 400,000 fatalities have been recorded annually at oceanic beaches on a worldwide basis. Closer to home in the United States, the U.S. Lifesaving Association for 2007 reported 40,910 of the 74,463 rescues reported at U.S. beaches were rip-related. Sadly, the Florida panhandle is the worst area in the nation for beach drownings, and Santa Rosa Island was designated the "Drowning Capital" after 11 drownings in 2001. Between 2000 and 2008, 25 drownings occurred at Pensacola Beach. Houser, Caldwell, and Meyer-Arendt in Chapter 11 go on to report that model results indicate that the average velocity of rip currents ranges from 0.18 to 0.24 m s^{-1} on days with rescues and from 0.19 to 0.33 m s^{-1} for drownings. Florida has the most rip-current deaths of any state, with an estimated 162 victims from 1999 through 2008. These kinds of statistics are spread throughout the book and include rip current hazards in the Great Lakes as well.

If nothing else, the statistics point out the need for beach safety programs and better management of beachgoers through education programs. There are many examples cited in the book as well as evaluations of program success in different areas. A good example of such efforts is perhaps Rob Brander's book, *Dr. Rip's Essential Beach Book: Everything You Need to Know About Surf, Sand and Rips* (Brander, 2010). There are several examples in this book, and so the two separate volumes, produced a year apart (one in Australia and one in the United States) make a nice pair.

Rip Currents is well prepared as a hard-cover book with a color section in the middle. This work is, in my opinion, a step in the study of rip currents because it brings together a wide range of scattered studies that were previously published in a large range of journals. The references in each chapter here thus build up a cadre of citations that collect relevant works in one place. This greatly facilitates new research and provides a handy source of references. The book contains about four pages of index that help the reader find salient topics. I recommend the book without reservation and suggest that it belongs in all libraries that deal with coastal marine topics and physical oceanography. The editors are to be congratulated for organizing and hosting a meeting that brought researchers together from many countries to share their results and views of the rip current problem. Further understanding of the material presented in this book will no doubt be promoted and directed to beachgoers the world over in an effort to save lives that need not be lost due to ignorance of rip currents, a hidden danger along many coasts.

LITERATURE CITED

Brander, R., 2010. *Dr. Rip's Essential Beach Book: Everything You Need to Know About Surf, Sand and Rips*. Sydney, New South Wales, Australia: University of New South Wales Press Press, 238p.

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DOI: 10.2112/11A-00019.1

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Rip currents are a global phenomena occurring wherever there is sand and surf and even rocks and surf. They are an important and, to the trained eye, very visible surf zone process. They are also the major physical hazard at the beach, contributing to more than 80% of beach rescues and drowning thousands annually. While the scientific study of rips dates back a century, the hazard they pose to swimmers has received far less attention from the scientific community. This book seeks to redress this situation by bringing together the scientific and beach safety communities to improve our knowledge of rip currents, as well as by using this knowledge to reach out to the public, thereby improving beach safety.

The book is a compilation of 16 papers presented at the first Rip Current Symposium held in Miami in 2010. The book was edited by Stephen Leatherman and John Fletemeyer, who organized the symposium, and was published in hardcover by CRC Press. Fourteen of the papers report on U.S. research, one is from Brazil, and one is from the United Kingdom. Only two papers, however, report on *in situ* measurements of rip currents, with most reviewing rip rescue and drowning statistics, reporting on methods to forecast rips, and/or discussing related beach safety education and outreach. As a consequence, the reader finishes the book with a feeling there is still much to be done in terms of *in situ* rip current research, along with education of the public and quite a few of the papers' authors. Apart from the first and last chapter, there appears to be little organisation of the papers into a logical order; hence, this review starts with the better papers and goes on from there.

The key and most informative papers are the paper by Brander and MacMahan, which leads the book, and the one by Scott *et al.* in the United Kingdom, both of which are based on excellent *in situ* rip current measurements and show a good understanding of rips. Brander and MacMahan start with a paper titled "Future challenges for rip current research and outreach," which highlights the dual purpose of the book. It provides a good review of rip current research, followed by rip current characteristics, rip prediction, and the application of this knowledge to outreach and raising public awareness.

Scott *et al.* present "Rip current hazards on large-tidal beaches in the United Kingdom," which is an excellent paper providing an overview of the research undertaken on the macro- to megatidal UK beaches by the Plymouth group in collaboration with the Royal National Lifeboat Institute. It presents an array of field data and measurements of morphology, processes, and rip circulation, together with rescue incident reports to discuss the role of beach type, seasonal shift in morphology, waves, and particularly tides in beach hazards. It also reviews the high-risk scenarios (transverse bar–rip morphology, low to medium swell, and spring tides) that lead to mass rescues and concludes with advice to lifeguards patrolling such beaches.

The remaining papers are a mixed bag. Some are short, others are poorly written or organised, many are not very informative, and none apparently were subjected to rigorous editing. Eight deal with some kind of rip forecasting or prediction, most with minimal success.

Nelko and Dalrymple, in "Rip current prediction at Ocean Beach, Maryland," use the relationship between rip rescues and sea conditions to try to predict rip currents. Dusek *et al.,* in "Analysis of rip current rescues at Kill Devil Hills, North Carolina," examine lifeguard records to test the relationship between rescues and prevailing conditions. Voulgaris *et al.* present "Methodology for prediction of rip currents using a three-dimensional numerical, coupled, wave current model," in which they use a suite of numerical models to predict rip current occurrence. Dean and Thieke, in "Surf zone hazards: rip currents and waves," model the impact of currents on people wading in the surf zone, followed by a snatch bag of ideas on rip current prediction and education. Haus discusses in "Remote sensing applied to rip current forecasts and identification" a number of remote sensing techniques to identify rip currents. Paxton, in "Meteorological data analysis of rip current drowning," examines the relationship between U.S. rip current deaths and injuries and attendant weather patterns, focusing on the infamous Black Sunday on the Florida Panhandle. Houser *et al.* present "Rip current hazards at Pensacola Beach, Florida," which is one of the better papers that examines conditions when drowning occurs and recommends direct measurements of rip velocity, location, and timing. Meadows *et al.,* in "Rip currents in the Great Lakes: an unfortunate truth," remind us that rips do occur on the Great Lakes and regularly drown people, as this paper seeks to establish an empirical checklist of conditions that generate rip currents.

Of the remaining six papers, two are field based. The paper by Slattery *et al.* ("Flash rip currents on ocean shoreline of Long Island, New York") attempts to monitor flash rip using video cameras, with rather inconclusive results. The late Kraus's "Tracing sand movement in strong Japanese rip currents" reports on a decades-old experiment to trace sand transport in a rip current.

Three chapters deal with beach rescue/drowning statistics and attendant beach safety programs. Lushine presents "Florida rip current deaths: forecasts and statistics," a short

paper that gives official statistics on rip current deaths in Florida. Fletemeyer, in "Effectiveness of Panama City beach safety program," reviews drowning statistics and beach safety measures at Panama City beach. Calliari *et al.* present "Beach safety management in Brazil," a good overview of rip rescue statistics and a successful beach safety program in Brazil.

The book finishes with Leatherman's "Rip currents: terminology and proactive beach safety," which is another mixed bag of rip-bits that covers terminology, rip current detection, and both reactive and some proactive beach safety.

In all, despite being presented as an edited book, this is more a collection of some good and some so-so conference papers to do with rip currents. A few appear to be written on the way home from the conference. While not a good start to the first "book" devoted to rip currents, it highlights just how much we need to educate both the public and the practitioners. This will continue at the 2012 Rip Current Symposium to be held in Sydney, Australia—a locale where rips, lifeguards, and rescues abound.

So who will read this book? The scientific audience will be disappointed, the beach safety audience confused, and I doubt it will get as far as the public.

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