

Global Storm Surges: Theory, Observations and Applications

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Vorwort

Im Mai 1979 bat die World Meteorological Organization (WMO) den Meteorologen Dr. TAD MURTY, Wissenschaftler bei der Bundesregierung von Kanada, den meteorologischen Dienst von Bangladesh (BMD) bei der Entwicklung von Sturmflutvorhersagemodellen für Bangladesh zu unterstützen. Bei der Literaturrecherche stellte er fest, dass es kein umfassendes Lehrbuch über Sturmfluten gab. Mit Unterstützung der Bundesregierung von Kanada schrieb er deshalb das Buch „Storm Surges – Meteorological Ocean Tides“, das 1984 als Monographie veröffentlicht wurde. Die dem Buch zugrunde liegenden Literaturrecherchen reichten bis in das Jahr 1982.

Wegen der starken Entwicklung in der Sturmflutforschung in den Jahren 1985 bis 1995 schlugen viele Kollegen TAD MURTY vor, das Buch zu überarbeiten und die neuesten Forschungsergebnisse einzubeziehen. Während einer Diskussion mit dem verstorbenen Prof. Dr.-Ing. WINFRIED SIEFERT, Leiter der Hydrologie in der Wirtschaftsbehörde Strom- und Hafenbau Hamburg und Experte in den Bereichen Sturmfluten und Vorhersage, einigte man sich auf eine gemeinsame Überarbeitung und Neuauflage dieses Buches. In den Kreis der Mitautoren wurden Prof. Dr. SHISHIR K. DUBE aus Indien, der zu den wichtigsten Sturmflutmodellierern der Welt gehört, und Dr. GABRIELE GÖNNERT, wissenschaftliche Mitarbeiterin von Prof. SIEFERT bei der Wirtschaftsbehörde Strom- und Hafenbau Hamburg, einbezogen. Frau GÖNNERT hat zudem die Veröffentlichung des neuen Buches mit dem Titel „Global Storm Surges: Theory, Observations and Applications“ geplant und organisiert. Es war die Absicht der Autoren, die wichtigen und grundlegenden Abschnitte der Monographie „Storm Surges – Meteorological Ocean Tides“ von Dr. MURTY in einer überarbeiteten Version zu übernehmen.

Zwei Treffen von je einer Woche in Hamburg 1996 und 1998 dienten der Koordination der Buchinhalte, die von den vier Autoren geschrieben wurden. Das Abschlusstreffen über zwei Wochen fand im Centre of Atmospheric Sciences, Indian Institute of Technology, Delhi, Indien, statt. Hier wurde das gesamte Manuskript fertiggestellt.

Das Bundesministerium für Forschung und Technologie (BMBF) stellte Fördermittel für die Arbeit am Buch, die Arbeitstreffen und den Druck zur Verfügung. Darüber hinaus entschied das Kuratorium für Forschung im Küstingenieurwesen (KFKI), dass das Buch als Sonderheft des *Archivs für Forschung und Technik an Nord- und Ostsee* „Die Küste“ erscheinen soll. Für Beantragung von Geldmitteln für den Druck, Organisation und Revision des Buches danken die Autoren Dr.-Ing. V. BARTHEL.

Dr. GÖNNERT möchte den Mitgliedern der Projektgruppe des Forschungsprojektes „Windstauanalysen in Nord- und Ostsee“ mit LBD P. PETERSEN, Dr.-Ing. G. FLÜGGE, RD H. SCHMIDT, Dr.-Ing. E. RENGER, Prof. Dr.-Ing. H. KUNZ und Dipl.-Ing. D. SCHALLER für die Diskussionen und Ideen während der Forschungsarbeit zu Sturmfluten und der Neubearbeitung des Buches danken. RD R. ANNUTSCH gilt besonderer Dank für die Unterstützung bei der Diskussion wesentlicher Fragen im Forschungsbereich Sturmfluten. Er investierte viel Zeit in die Gespräche zum Thema Tide und Sturmfluten.

Keine Worte können den tiefen Dank von Dr. GÖNNERT gegenüber Prof. Dr.-Ing. WINFRIED SIEFERT realistisch beschreiben. Er war ihr Lehrer im Küstingenieurwesen, Doktorvater und ihr Vorgesetzter in der Hydrologie bei Strom- und Hafenbau Hamburg.

Prof. DUBE dankt dem Indian Institute of Technology, Delhi, und hier besonders Direktor Prof. V. S. RAJU dafür, dass er alle Einrichtungen des Instituts zur Verfügung stellte sowie für die moralische Unterstützung bei der Fertigstellung des Buches. Großer Dank geht an Prof. SINHA, Dr. A. D. RAO, Dr. P. CHITTIBABU, Dr. BHASKARAN, Ms. RUCHI KALRA und Mr. DEBASIS MAHAPATRA vom Centre for Atmospheric Sciences, IIT Delhi für ihre Beiträge.

Dr. MURTY dankt der Regierung von Kanada, die das erste Buch ermöglicht hat, und dem Ingenieurbüro Baird and Associates Coastal Engineers, Ottawa, Kanada, für die Möglichkeit, das zweite, hier vorliegende Buch, zu erstellen. Dank und Anerkennung gilt weiterhin den Beiträgen von Prof. GEORGE W. PLATZMAN von der Universität von Chicago und den Kollegen Dr. D. RAO, Dr. R. F. HENRY sowie den verstorbenen Dr. T. J. SIMONS und Dr. M. I. EL SABH bei der Weiterentwicklung des Verständnisses des Sturmflutphänomens. Dr. M. B. DANRD und Dr. JOHN LUICK und dem verstorbenen Dr. N. G. FREEMAN sei ebenfalls für ihre Beiträge gedankt.

P r e f a c e

In May 1979 the World Meteorological Organization (WMO) invited Dr. TAD MURTY, a senior Research Scientist working for the Federal Government of Canada, to help the Bangladesh Meteorological Department (BMD) with the development of storm surge prediction models for the Bay of Bengal. Dr. MURTY looked for lecture material on storm surges for talks in Bangladesh and elsewhere and found that as yet there was no textbook on storm surges. Using the resources of the Canadian Government, he wrote a book titled "Storm Surges – Meteorological Ocean Tides" which was published as a monograph by the Canadian Government. This book was published in October 1984, and the references that were cited were up to date till the end of 1982.

During the years 1985 to 1995, several colleagues of MURTY around the world suggested to him that in view of the tremendous advances made in storm surge research during those years, it will be very useful for the global research community to have an updated version of the book which includes a synthesis of the new material and this should be the goal of an updated version. In 1995 during discussions with the late Dr. WINFRIED SIEFERT, head of hydrology at the Department of Port and River Engineering of Free and Hanseatic City of Hamburg and specialist in storm surges and protection, Drs. MURTY and SIEFERT realised that the book by Dr. MURTY should be updated. Subsequently Prof. SHISHIR K. DUBE, an eminent storm surge modeler from India, who is among the top surge modelers in the world was recruited to be a co-author in this effort. Also Dr. GABI GÖNNERT, scientist for climatology, tides, storm surges and protection at the Department of Port and River Engineering of Free and Hanseatic City of Hamburg was recruited to be a co-author and she took the lead in organizing, planning and publication of the new book, which is titled "Global Storm Surges: Theory, Observations and Applications". It is the intention in this new book to use necessary and basic parts from the monograph of Dr. MURTY "Storm Surges – Meteorological Ocean Tides". Therefore revised repetitions from the book of MURTY (1984) were included in the new book.

Two meetings (each one week long) were held in Hamburg during 1996 and 1998 to coordinate the parts written by the four authors. A final meeting, two weeks long was held at

the Centre for Atmospheric Sciences, Indian Institute of Technology, Delhi, India, to put together the full manuscript.

The Federal Government of Germany (BMBF) provided funding for work on the book, for the necessary meetings and for printing. Moreover, the Coastal Engineering Research Council (KFKI) decided to have the book printed as a special issue of "Die Küste". For providing funding for printing, organization and for reviewing the book the authors express their gratitude to Dr. V. BARTHEL.

Dr. GÖNNERT would like to recognize the contributions of the members of the working group for the research project "Storm Surges in the German Bight" with LBD PETERSEN, Dr. G. FLÜGGE, RD H. SCHMIDT, Dr. E. RENGER, Prof. Dr. H. KUNZ and Dipl.-Ing. D. SCHALLER for discussion and productive ideas enabling her research in storm surges and revising this book. RD RALF ANNUTSCH's help is greatly acknowledged. He assisted in developing her understanding in storm surges and took always time for discussions on tides and storm surges.

No words can describe realistically Dr. GÖNNERT's acknowledgement of and deep gratitude towards the late Prof. Dr. W. SIEFERT. He was her teacher in coastal engineering, supervisor and head at the Department of Port and River engineering.

Professor DUBE is grateful to the Indian Institute of Technology Delhi in general and Professor V. S. RAJU, Director in particular for extending all facilities and providing moral support for the completion of the book. Contributions made by Professor P. C. SINHA, Dr. A. D. RAO, Dr. P. CHITTIBABU, Dr. P. K. BHASKARAN, Ms. RUCHI KALRA and Mr. DEBASIS MAHAPATRA of the Centre for Atmospheric Sciences, IIT Delhi is greatly acknowledged.

Dr. MURTY expresses his gratitude to the Government of Canada to make the first book possible and to Baird and Associates Coastal Engineers of Ottawa, Canada, to make the second book possible. He also would like to recognize the contributions from Prof. GEORGE W. PLATZMAN of the University of Chicago, and his professional colleagues Dr. D. B. RAO, Dr. R. F. HENRY and the late Drs. T. J. SIMONS and M. I. EL-SABH, in developing his understanding of the storm surge phenomena. Contributions made by Dr. M. B. DANARD and Dr. JOHN LUICK and the late Dr. N. G. FREEMAN are also greatly acknowledged.

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