



New generation propeller cleaning offers large cost savings	3
Underwater bow thruster reinstallation in Tacoma, U.S.A.	4
New Book Announcement	9

Contents

Page 3

New generation propeller cleaning offers large cost savings

Page 4 - 7

Underwater bow thruster reinstallation in Tacoma, U.S.A.

Page 9 - 10

New Book Announcement
Quantification of Pollution Levels in Harbour Sediments – A Geospatial Perspective

KEEPING SHIPS IN BUSINESS

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technology approved by:



Permanent rudder repairs now possible without drydocking



Hydrex has developed an entirely new method enabling permanent repairs of rudders without drydocking the ship. Permanent repairs were hitherto not possible and ships had to drydock in case a major defect was found. The newly designed equipment is light-weight and can be mobilized very rapidly in our special flight containers. Therefore this new service is now available world-wide.

Major defects on rudders very often cause unscheduled dry-docking of ships. The new method designed by our technical

department allows engineers, welders and inspectors to perform their tasks in dry conditions. Class approved permanent repairs on-site, without moving the ship, are now possible and commercial operations can continue. Steel repairs and replacements can be performed and pintle and bushing defects can be solved without the loss of time and money associated with drydocking.

The equipment can be mobilized within hours to any port in the world and is available for rapid mobilization from the Hydrex headquarters in Antwerp.

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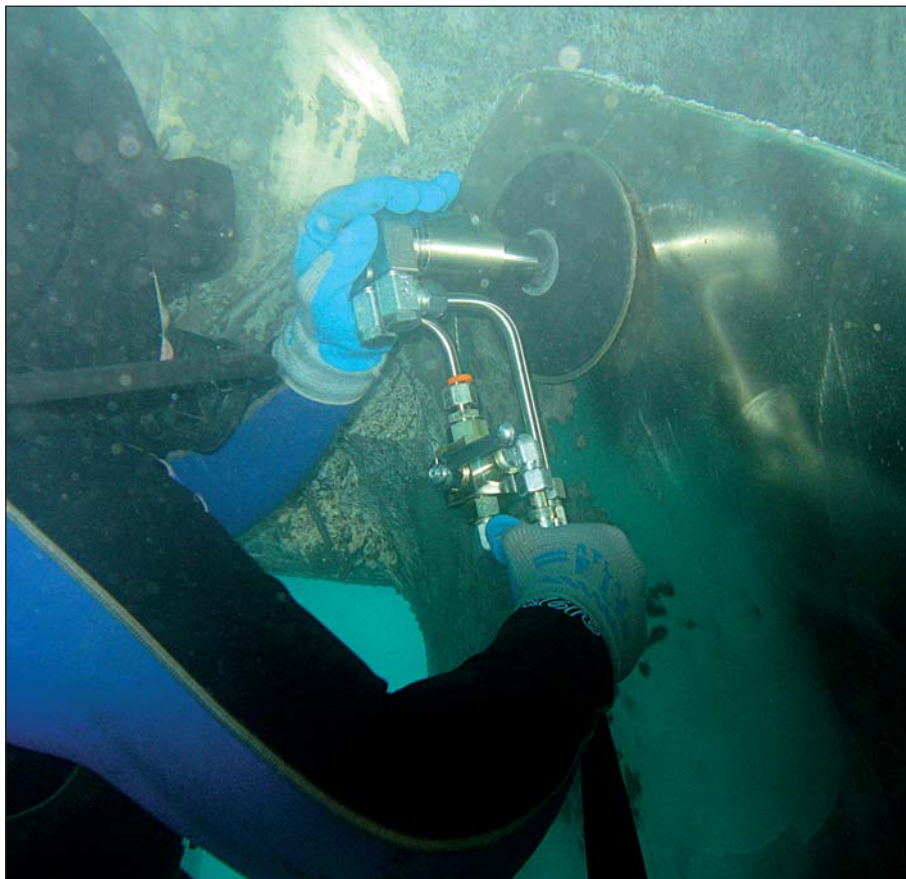
New generation propeller cleaning offers large cost savings

The effect of a rough propeller on the vessel's fuel consumption is significant. The cost of remedying a rough propeller is very minor. Remedies for a rough propeller are not only simple and quick to execute, they also represent a fast, high return on investment.

A rough propeller results in a fuel penalty for the ship. How large that penalty is depends on the degree of roughness. At current fuel prices, the fuel penalty from a rough propeller adds up to a high cost. Conversely, the savings attainable from keeping a ship's propeller clean and smooth are significant.

Mr. Eric Fjellström, Chief Engineer of M/V Carmen said that "you can also clearly tell the difference in ships' performance after Hydrex has done its thing [propeller cleaning]."

Badly done polishing with a polishing disc or grinding wheel can in itself create a rougher surface than that of the new propeller, leaving scratches which not only increase



Propeller cleaning represents a fast, high return on investment.

the propeller's roughness but also invite easier attachment of fouling organisms.

Cleaning a propeller once every month or every two months would in many cases be optimum. If carried out this frequently, cleaning with a relatively soft tool is adequate to keep a well-maintained propeller smooth. Such light cleaning can be accomplished rapidly and efficiently.

Thanks to its network of offices and service stations, Hydrex can offer propeller cleanings on a worldwide basis. These operations are carried out using underwater equipment designed and developed in-house

specifically for propeller maintenance. Hydrex combines this service with underwater inspections where this is economically advantageous to the shipowner or operator.

More information on the advantages of propeller cleanings can be found in Hydrex White Paper No. 10: *Ship Propeller Maintenance: Polish or Clean?*, which is available for download for free at www.shiphullperformance.org ■



Propeller cleanings are carried out using underwater equipment designed and developed in-house.



Underwater bow thruster reinstallation in Tacoma, U.S.A.

Three months after Hydrex diver/technicians removed the bow thruster of a 294-meter container vessel in Tacoma, a Hydrex team once again mobilized to this location to reinstall the overhauled unit underwater with the use of the Hydrex flexible mobdock.

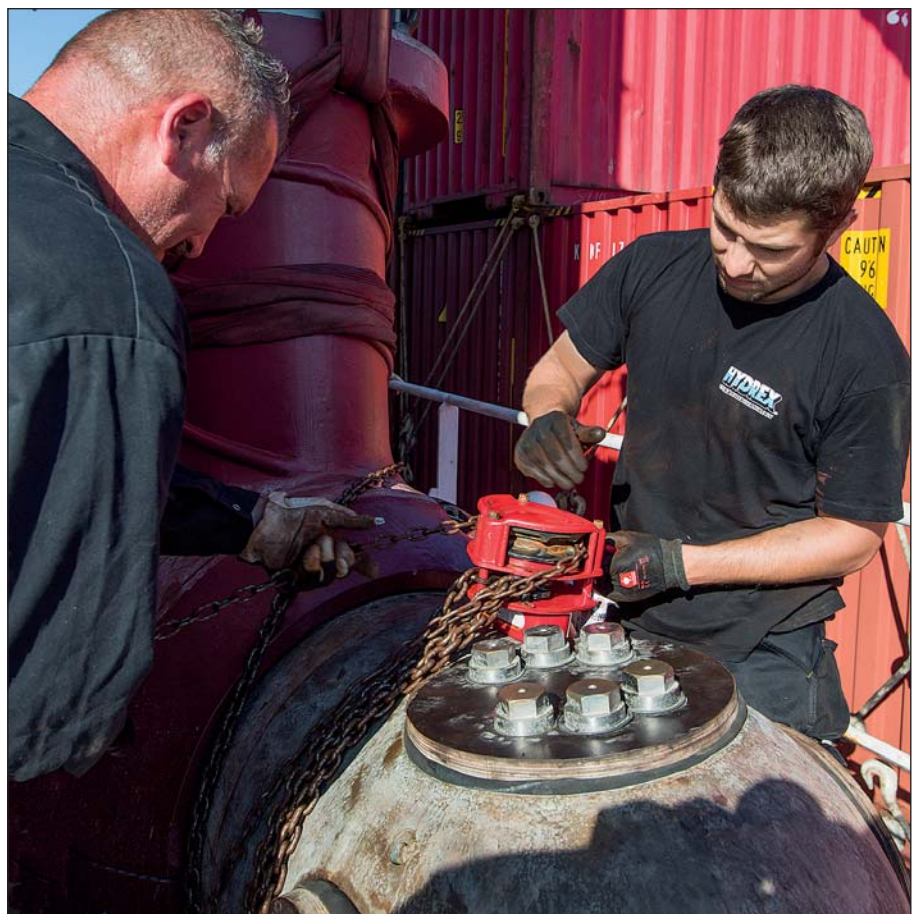
The superintendent of the ship was very satisfied with the first part of the operation. The job was completed well within the available time frame thanks to good team work of the Hydrex divers, the ship staff and the floating crane operator. For this reason the customer asked Hydrex to take care of the reinstallation as well, which was carried out last month.

Together with all the necessary equipment, the team mobilized from the Hydrex office in Clearwater, Florida to the vessel's location. After they set up a monitoring station on a workboat, the team positioned the bow thruster onto a cradle. This cradle was designed especially for thruster operations. It can be adjusted to the size of the unit. In this manner the thruster is prevented from tipping over, making it much easier to handle. The Hydrex divers could lower the unit into the water and maneuver it inside the thruster tunnel in one take. The team positioned the bow thruster and secured the unit.

The team then used the lightweight flexible mobdocks developed by Hydrex to close off the thruster tunnel on both sides. This allowed the diver/technicians to evacuate all the



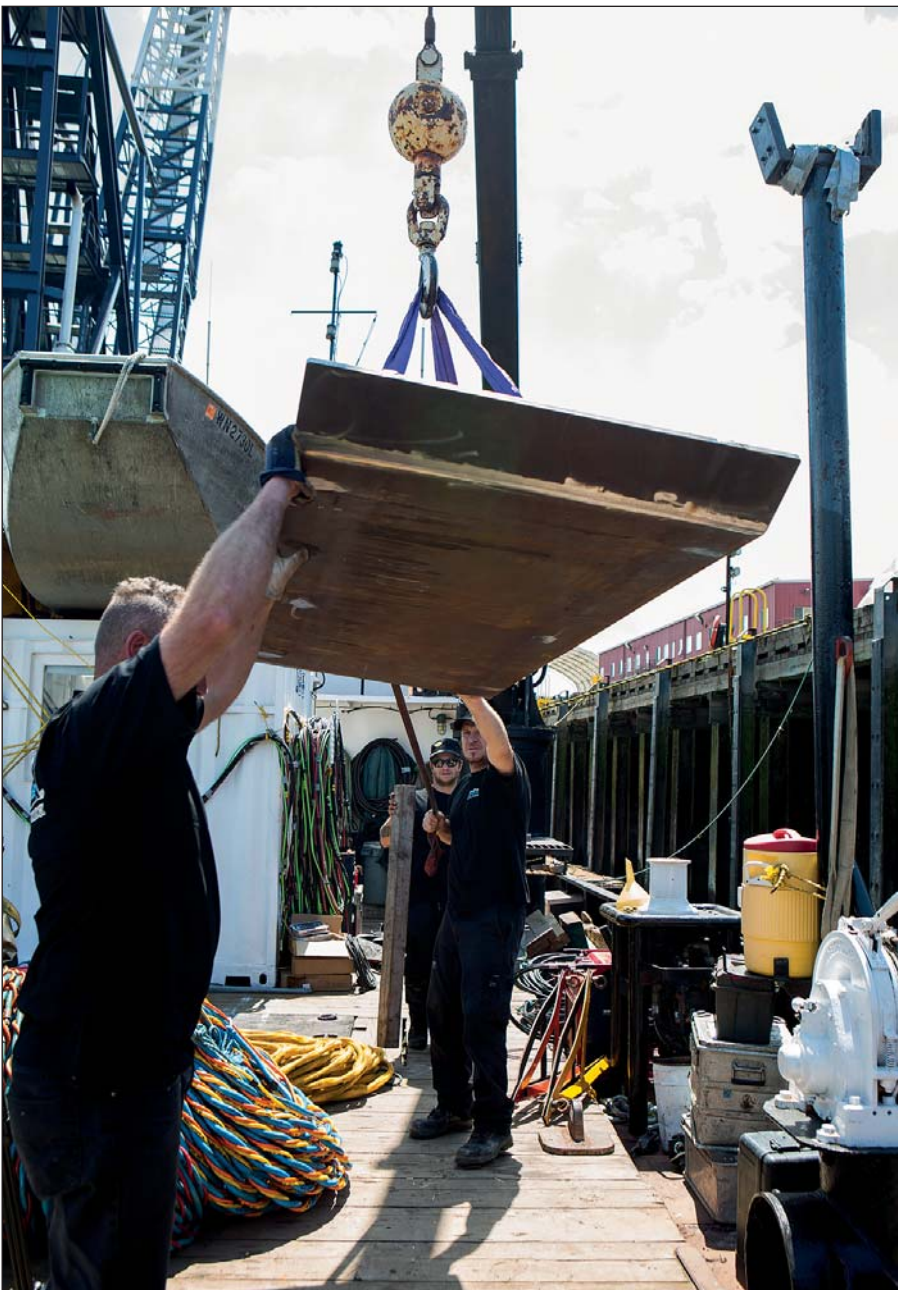
Hydrex performed a bow thruster reinstallation in to Port of Tacoma, Washington, U.S.A.



Hydrex diver/technicians preparing the bow thruster for reinstallation.



A monitoring station was set up on a workboat.



Hydrex has designed a special cradle for bow thruster operations.

Fast underwater ship hull repairs save time and money



Hydrex on-site hull repair services include the renewal of both small and large areas of damaged hull plating. These repairs can be carried out above or below water, according to the circumstances, with tailor-made mobdocks. Normal commercial activities can therefore continue without disruption. These operations follow the Hydrex procedure for welding cracks in the vessel's shell plating and they are approved by the major classification societies.

Hydrex diver/technician teams carry out these on-site hull repairs all over the world. In most cases the damaged area can be replaced with a permanent insert and no condition of class is imposed. On the rare occasions where the damage does not allow such a repair, a temporary doubler plate is installed over the affected area. This allows the owners to keep to their schedule and have a permanent repair carried out during the next scheduled drydock visit.

To offer the fastest possible service to customers, Hydrex offices have fast response centers where an extensive range of state-of-the-art tools and diving support equipment is available at all times for the repair teams.

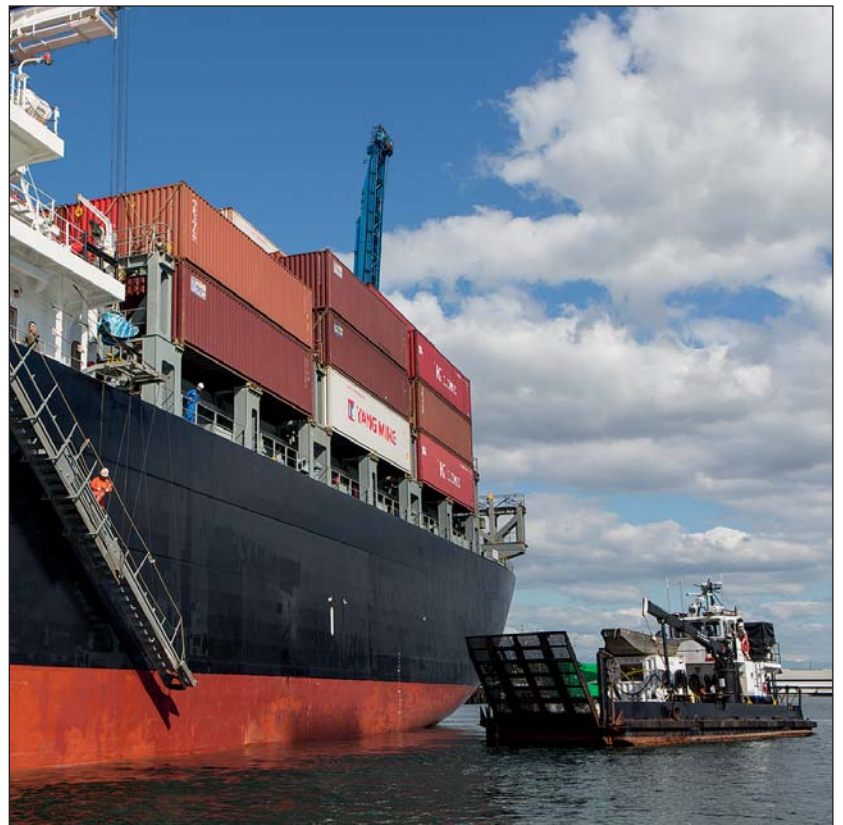
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The bow thruster unit being lowered onto the workboat.



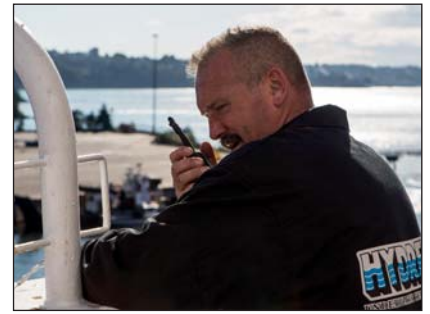
Preparation of the hull for the chains used to lower the unit.



Hydrex diver/technicians preparing the bow thruster for reinstallation.



Hydrex diver preparing for the underwater operation.



Team members stayed in close communication throughout every step of the operation.

water from the tunnel and create a dry working environment around the bow thruster. The thruster propeller blades were then reinstalled one by one. The team completed the operation by reconnecting the thruster unit to the engine room.



Bow thruster unit being positioned in the thruster tunnel.

Hydrex can assist shipowners with almost any problem they encounter with their vessel's thruster. A wide range of repair or maintenance work can be carried out to all types of thrusters. An entire unit can be overhauled, propeller blades or seals can be replaced or repair work on a specific part of a thruster can be performed by Hydrex diver/technicians on site. All of these repairs can be carried out without the need to drydock the vessel.

Off-hire time causes a substantial loss of money. The teams therefore worked in shifts during both the removal and reinstallation of the bow thruster. This was done to perform the bow thruster operations within the shortest possible time frame, saving the owner the time and money which going to drydock would have entailed. ■



Hydrex team members preparing the equipment for demobilization.

Underwater stern tube seal repairs with new generation flexible mobdocks



Using our flexible mobdock method to create a dry underwater environment, we have carried out stern tube seal repairs and replacements underwater for some years now in cooperation with top specialist suppliers.

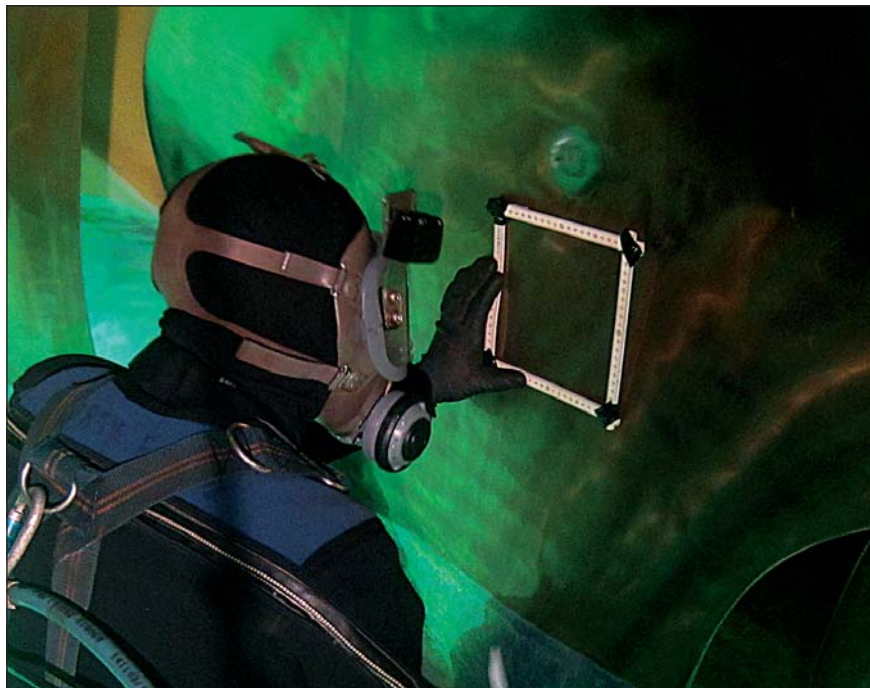
This technology brings drydock conditions to the ship rather than having to take the ship to drydock, saving a considerable amount of time and money in doing so.

This class accepted method is performed by our diving teams under our warranty. It can be used while the ship is carrying out its usual cargo or other commercial operations in port.

Visit the special stern tube seal repair section on our website for more information and examples of the many seal repairs we have performed in recent years.

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World premiere: permanent underwater repairs to all types of propellers now possible



Over the years the Hydrex R&D department has continuously improved underwater repair techniques to make it possible for Hydrex diver/technicians to perform permanent repairs on seals, thrusters, rudders and almost any other part of the underwater vessel without the ship needing to go to drydock.

The final step has now been taken by the development of a repair system that allows Hydrex to perform permanent underwater repairs to every type of propeller in dry conditions. All kinds of repair or maintenance work can be carried out to propellers, twin propellers, variable pitch propellers, azipod and collapsible thrusters.

This is especially important news for supply vessels, navy ships or any vessel under contract or on a location far away from available drydock possibilities. Staying on hire for underwater repairs will save precious time and money.

This new repair system can be transported by air transport to any location around the world from the Hydrex fast response centers within a very short time frame. It can be assembled very quickly (12 hours) on-site.

With the implementation of this technique our diver/technicians can now perform permanent repairs to all parts of the underwater ship propulsion system in drydock-like conditions. ■

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New Book Announcement

Quantification of Pollution Levels in Harbour Sediments – A Geospatial Perspective

As promised, the full report of a preliminary research project into global sediment contamination levels conducted by Dr. Ilse Steyl, Prof. Fani Sakellariadou and Dr. Simon Bray with a Technical Review by Dr. W. J. Langston of the Marine Biological Association, UK, has been published in hardback book form and is available at Tahoka Press (www.tahokapress.com).

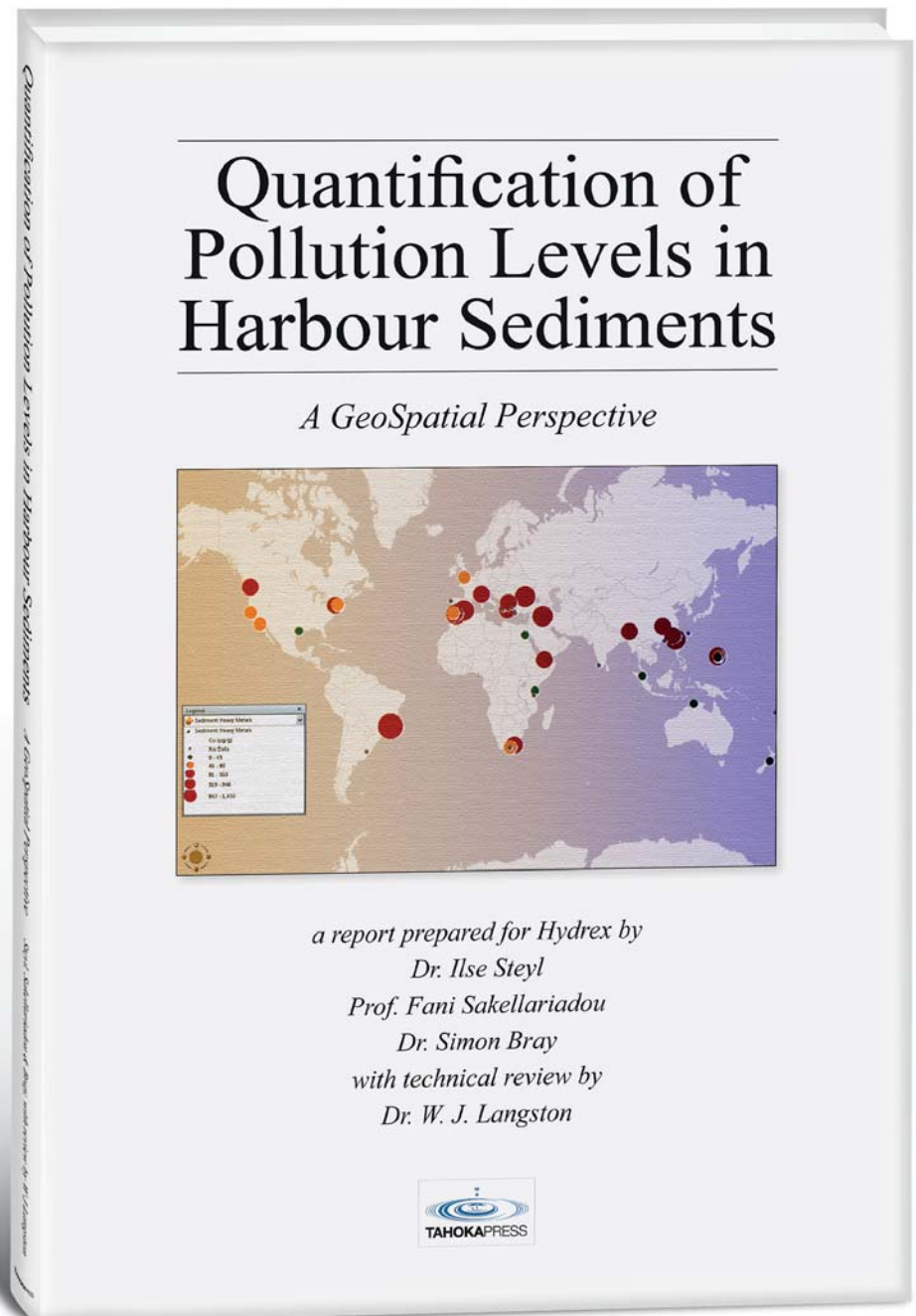
The Foreword to the book by Boud Van Rompay is published here in full as it explains the project and why Hydrex commissioned the research.

Foreword

Why would Hydrex commission a geospatially-oriented research project into the state of sediment pollution around the world?

In the 1970s, 80s and 90s, I became increasingly aware of the dangerous levels of contamination of the sediment around shipyards and dry-docks in Belgium and The Netherlands. Sediment contamination, particularly from ships' toxic anti-fouling coatings with their heavy metals and persistent toxic chemicals, had reached a level where dredging in many places was impossible without wreaking havoc in the marine environment.

I reasoned that if this was the case in these Belgian and Dutch ports and



waterways, then there would be many other zones around the world in a similar condition.

It was, in fact, this awareness that

led to my development of a non-toxic alternative hull coating system, Ecospeed, and later to my work on a contained dredging system which we are currently developing for wide

commercial use.

Hydrex is all about expertise with water. The company's goals are clean rivers, seas and oceans around the world.

So this study, carried out so ably by Dr. Ilse Steyl, Prof. Fani Sakellariadou and Dr. Simon Bray, all well-known experts in their fields, was commissioned out of a desire to get a good grip on the state of sediment pollution around the world. The geospatial approach and the potential of a geographical information system and a worldwide database appealed to us greatly because it would make it possible to quantify the state of sediments all over the world, make management of the marine environment possible and clearly demonstrate the need for a non-toxic approach to fouling control.

The results of this study, as summarized so accurately and eloquently in his technical review by world-renowned ecotoxicologist Dr. W. J. Langston, although it is only a preliminary research project, point strongly in the direction of the adoption of a non-toxic solution and also towards widespread remedial dredging which needs to be done economically and without introducing new environmental hazards.

I am personally very encouraged by these results and look forward to a full, detailed, ongoing worldwide continuation of this study and the ultimate creation of a live, expanding database and geographic information system (GIS) which provides a complete spatial and temporal window on the state of sediment contamination worldwide. They vindicate the direction we have taken in promoting a non-toxic ans-

wer to biofouling and a safe and economical approach to remedial dredging.



Boud Van Rompay, Founder and CEO Hydrex Antwerp, June 2013

The following extract from the Technical Review by world-renowned ecotoxicologist, Dr. Bill Langston of the UK's Marine Biological Association, sums up the value of the report:

“In summary this report provides an enlightening, critical and authoritative review of the fundamental processes which affect the distribution, concentration and effects of sediment-bound contaminants, the legislation surrounding them and importantly, strategy by which environmental managers and port authorities can address the practical issues of remediation and sustainable, cost-effective operation. Suggestions for data handling, retrieval and display, including incorporation into accessible local, regional and global GIS format are particularly informative and will help managers, scientists and public understand the extent, scale and sources of pollution problems in estuarine and coastal ecosystems – a vital pre-requisite when deciding on the relative merits of sediment treatment. In environmental (and possibly economic) cost terms, this review also demonstrates that a move towards non-toxic antifouling would be a sensible contribution to reducing the need for large-scale sediment manipulation and the attendant risk of contaminant exposure.”

The information contained in this new book is of vital importance to

shipowners and operators as it will make it easier for them to make decisions regarding underwater hull coating and maintenance for their vessels.

And this book is just the beginning. Steps are being taken to expand this research so as to create a global geodatabase and geographical information system for sediment pollution levels in all ports, harbors and waterways around the world and to maintain this database so that current data on all locations are available and so that trends can be monitored.

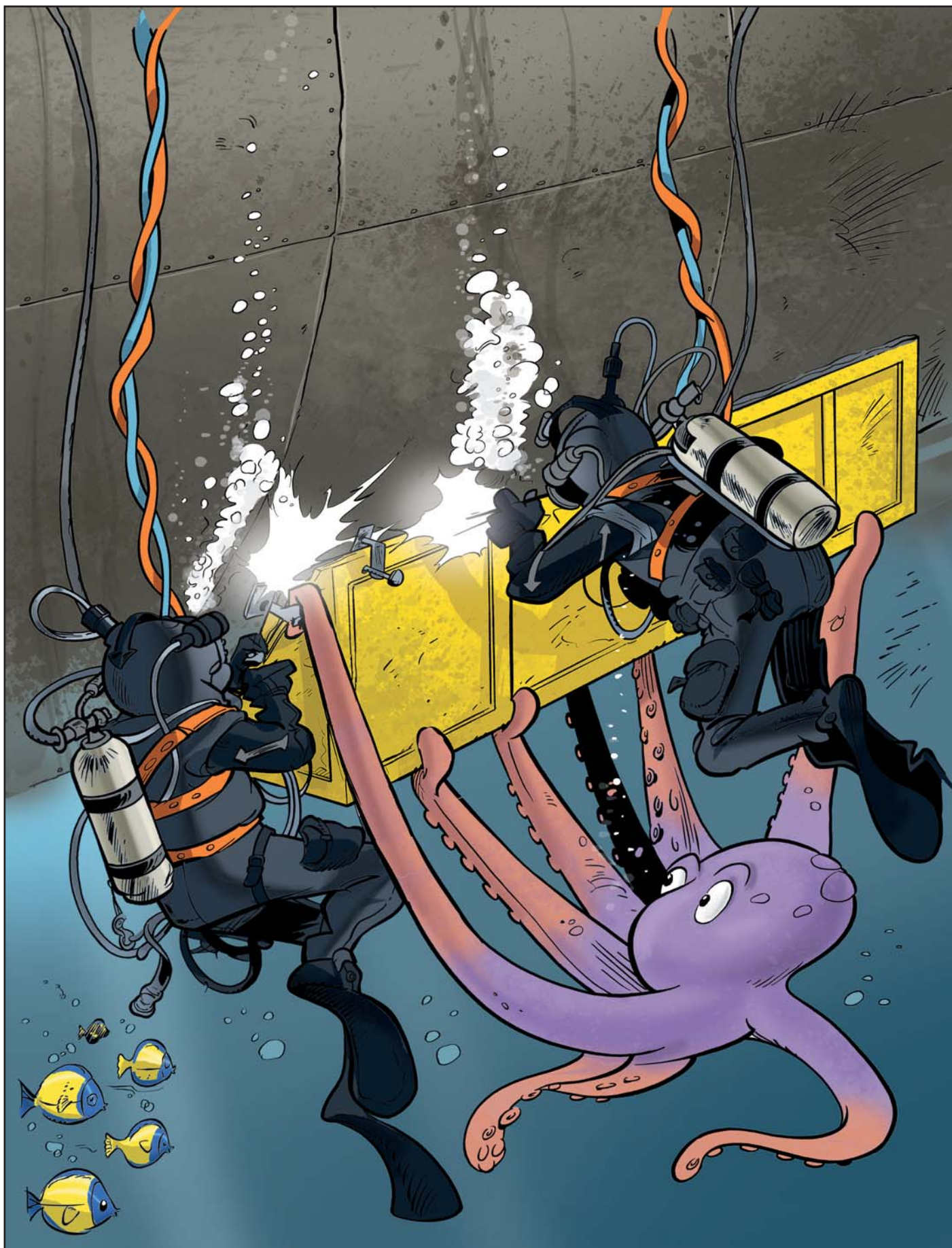
You may order your copy of Quantification of Pollution Levels in Harbour Sediments – A Geospatial Perspective at www.tahokapress.com.

The book will also soon be available for purchase from Amazon.com.

Digital versions of the book will be announced in due course. ■

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Keeping ships in business

Hydrex offers turnkey underwater repair solutions to ship-owners wherever and whenever they are needed. Hydrex's multi-disciplinary team will help you find the best solution for any problem encountered with your ship below the water line. We will immediately mobilize our diver/technicians to carry out necessary repair work without the need to drydock.

Hydrex has a long track record of

performing complex permanent underwater repairs to thrusters, propellers, rudders, stern tube seals and damaged or corroded hulls. By creating drydock-like conditions around the affected area, our diver/technicians can carry out these operations in port or at anchor.

All the projects we undertake are engineered and carried out in close cooperation with the customer and any third party suppliers, relieving

the customer of all the hassle of coordination, planning and supervision.

Headquartered in the Belgian port of Antwerp, we have offices in Tampa (U.S.A), Algeciras (Spain), Visakhapatnam (India), and Port Gentil (Gabon).

All Hydrex offices have fully operational fast response centers where an extensive range of state-of-the-art equipment is available at all times.



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