Tune
Tohoku University Research News of Engineering
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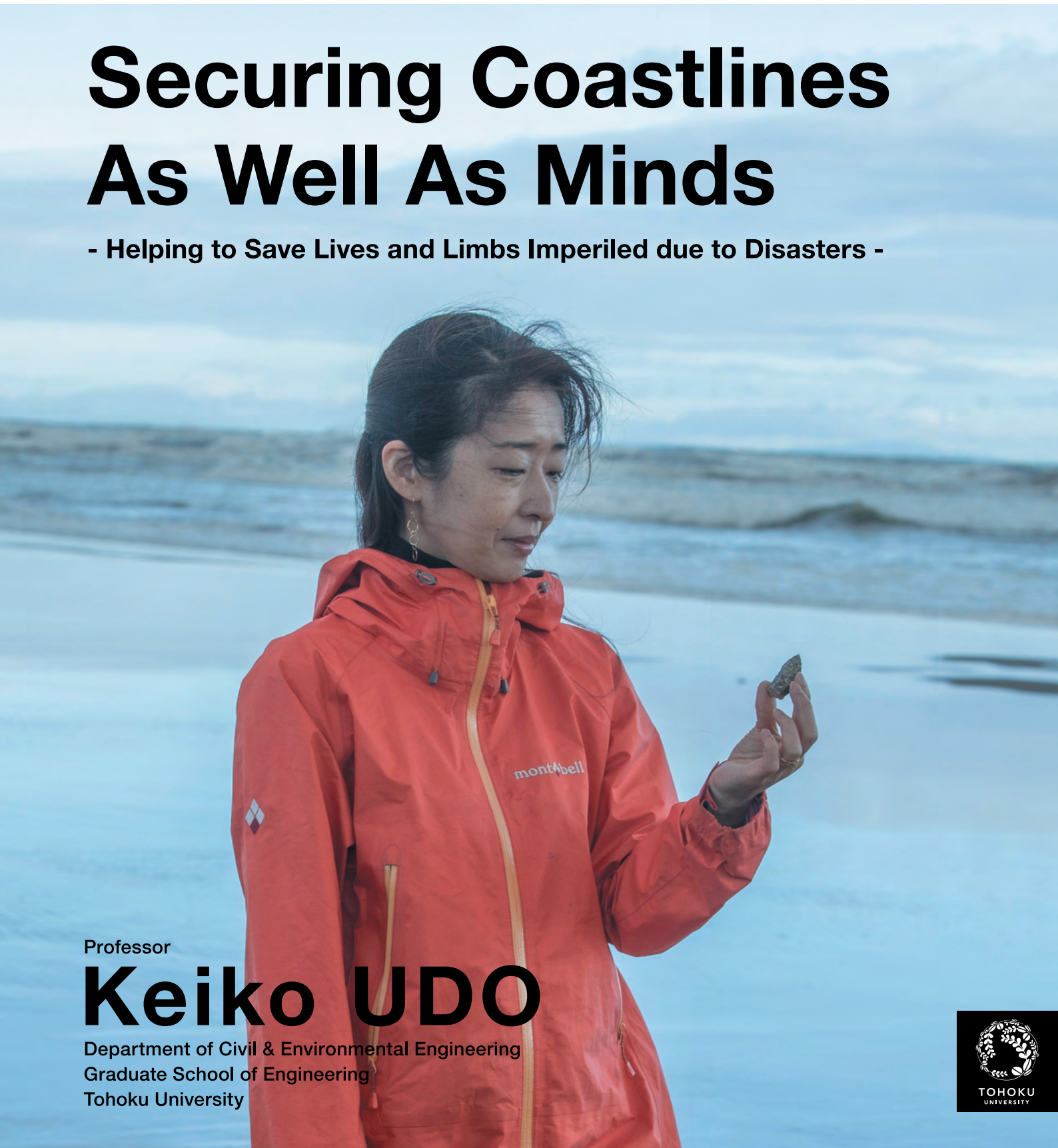
Securing Coastlines As Well As Minds

- Helping to Save Lives and Limbs Imperiled due to Disasters -



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TOHOKU UNIVERSITY

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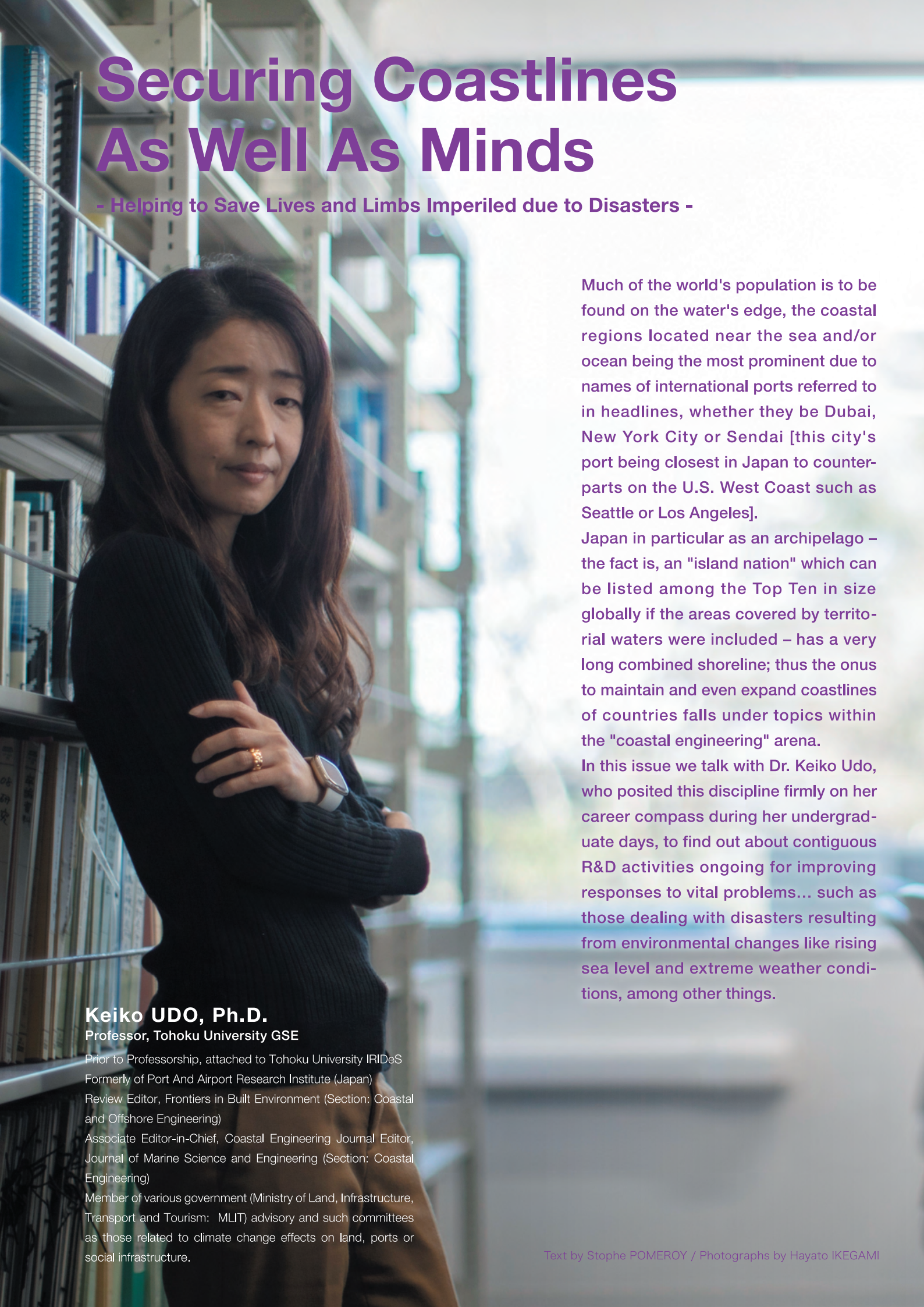

Much of the world's population is to be found on the water's edge, the coastal regions located near the sea and/or ocean being the most prominent due to names of international ports referred to in headlines, whether they be Dubai, New York City or Sendai [this city's port being closest in Japan to counterparts on the U.S. West Coast such as Seattle or Los Angeles].

Japan in particular as an archipelago – the fact is, an "island nation" which can be listed among the Top Ten in size globally if the areas covered by territorial waters were included – has a very long combined shoreline; thus the onus to maintain and even expand coastlines of countries falls under topics within the "coastal engineering" arena.

In this issue we talk with Dr. Keiko Udo, who posited this discipline firmly on her career compass during her undergraduate days, to find out about contiguous R&D activities ongoing for improving responses to vital problems... such as those dealing with disasters resulting from environmental changes like rising sea level and extreme weather conditions, among other things.

Keiko UDO, Ph.D.

Professor, Tohoku University GSE

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Formerly of Port And Airport Research Institute (Japan)
Review Editor, Frontiers in Built Environment (Section: Coastal and Offshore Engineering)
Associate Editor-in-Chief, Coastal Engineering Journal Editor, Journal of Marine Science and Engineering (Section: Coastal Engineering)
Member of various government (Ministry of Land, Infrastructure, Transport and Tourism: MLIT) advisory and such committees as those related to climate change effects on land, ports or social infrastructure.

Text by Stophe POMEROY / Photographs by Hayato IKEGAMI

Civil & Environmental Engineering

Stophe Pomeroy (SP): *Thank you for your time today. We understand that your research at the Civil & Environmental Engineering Department centers upon "coastal engineering" but actually your work is more wide-ranging, is it not?*

Dr. Keiko Udo (KU): Yes, my laboratory focuses on hydro-environmental informatics, which goes beyond the traditional definition of coastal engineering merely as a civil engineering discipline. When I was an undergraduate student I became very interested in coastal engineering which seeks to control and protect seacoasts, yet since then insights indicate that this discipline covers more than studies of the "coast" standalone as a field because the water and sediment systems are circulatory, having streams that are interlinked.

SP: *Ah, hence your fieldwork expands over areas inland as well as offshore, to enable monitoring of the outflows in fluvial deposits plus other substances?*

KU: Indeed, we need to study the flow of water and sediments emanating from mountaintops and elsewhere in order to fathom offshore phenomena even… the "informatics" angle covers the environmental engineering subject from a larger purview than was the case previously.

SP: *Quite, it makes sense to scrutinize the bigger picture if the aim is to counter seashore erosion or littoral zone pollution, for example.*

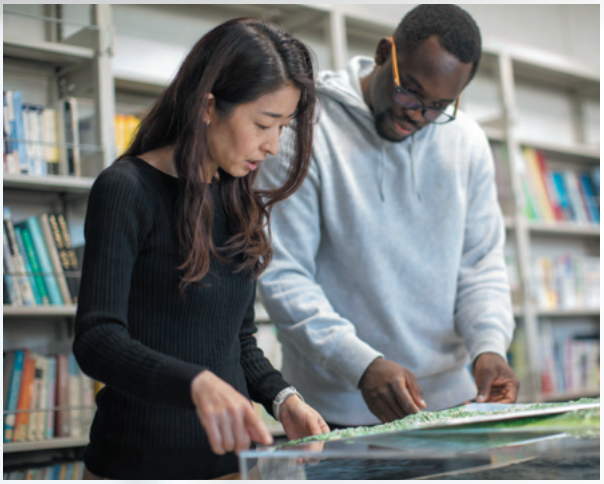
KU: This is very true, it behooves us to keep in mind the systemic set-up and all the mechanisms found behind the various forces at play that impact our targeted research items. However, we are human, we cannot maintain tabs on everything so must work in line with the simple tenet one Japanese Nobel Laureate often mentions: "Do what you must, but do not do what you needn't."

Research Roadmap

SP: *Could you tell us about your newly-opened lab in the Department of Civil and Environmental Engineering?*

KU: My Hydro-environmental Informatics Lab pursues, as per earlier explanation and in reflection of the naming, research concerning information obtained via the sourcing capabilities that have multiplied in recent years. Thanks especially to the rapid adoption of digital technology, real-time data provided by Geographic Information System (GIS), satellite, sensor array and other resources have markedly enhanced our endeavors.

SP: *Might you elaborate more about your role?*



KU: Being a full professor heading up a laboratory at a major school department as well as a working mother with a solid career, not to mention a scientist charged with finding ways to mitigate disasters and other potential threats to people's safety, I wish to take on the successful role model for female students considering a lifetime in the Science, Technology, Engineering + Mathematics (STEM) sector.

SP: *What roadmap do you envision for your present research activities?*

KU: Hopefully, my job will benefit the people who are faced with potential threats to life and limb posed by widespread natural disasters. Having a background of work at a research institution which specialized in ports and airports I am aware of the huge effect any major accident at facilities that oftentimes are sited in the vicinity of waterfronts would have on many countries. In terms of a roadmap, realizing a "green" infrastructure while bridling in costs to assure these structures are maintained constitutes one of the attainable goals internationally.

Read more on the web

http://tune.eng.tohoku.ac.jp/

The School of Engineering "Challenge to the Future" Fund Established

We at Faculty and Graduate School of Engineering, Tohoku University will fulfill the mission and responsibility in engineering "Aiming at a bright future in the international society". As an initial step upon realization of this grand goal, we must educate the youths who will lead the next era. We will provide the place and opportunities to the new generation of students and young researchers so that they can take on challenges in appropriate settings and readied to be active in global society. As the second step, research having a worldwide perspective is crucial. International exchanges and so-called "brain circulations" offer venues wherein unexplored arenas are sought and lead to valuable achievements.

Thirdly, there is the societal adoption of R&D results. We will find engineering solutions for social problems and identify new issues that emerge.

With the centennial anniversary of the School of Engineering at Tohoku University on hand, we have established the School of Engineering "Challenge to the Future" Fund. Our challenge henceforth will be to build upon the knowledge accumulated over the past century to open up new knowledge. In order to drive our respective plans to realization while overcoming difficulties and other problems we can expect, we shall utilize our own School of Engineering "Challenge to the Future" Fund as our activities financial source.

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1. Use QR Code or link below to go to［Tohoku University Fund, 東北大学基金］page
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   Donate to: **Support the department**
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3. Fill out the other required information on the application page to apply.

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The School of Engineering embraces "Research First" and "Open-door" as the basic principles, advocates "practice-oriented research and education" based on creativity, always opens its doors to the world as a research-intensive university.

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