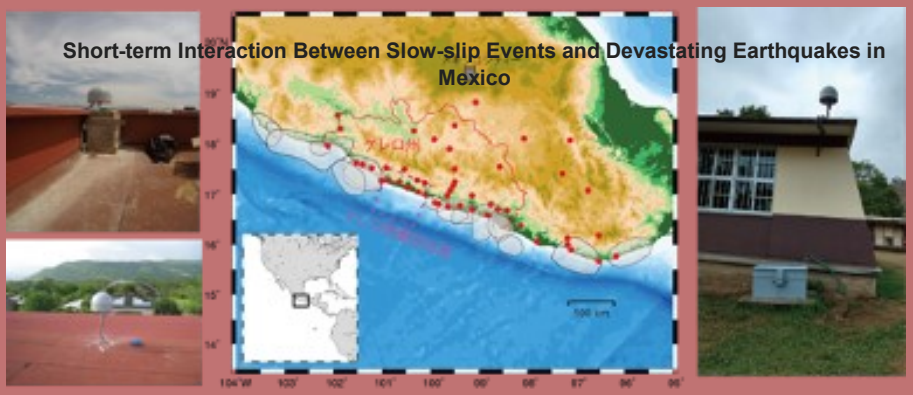
GADRI
Global Alliance of
Disaster Research Institutes



GADRI ACTIONS

Spring 2021
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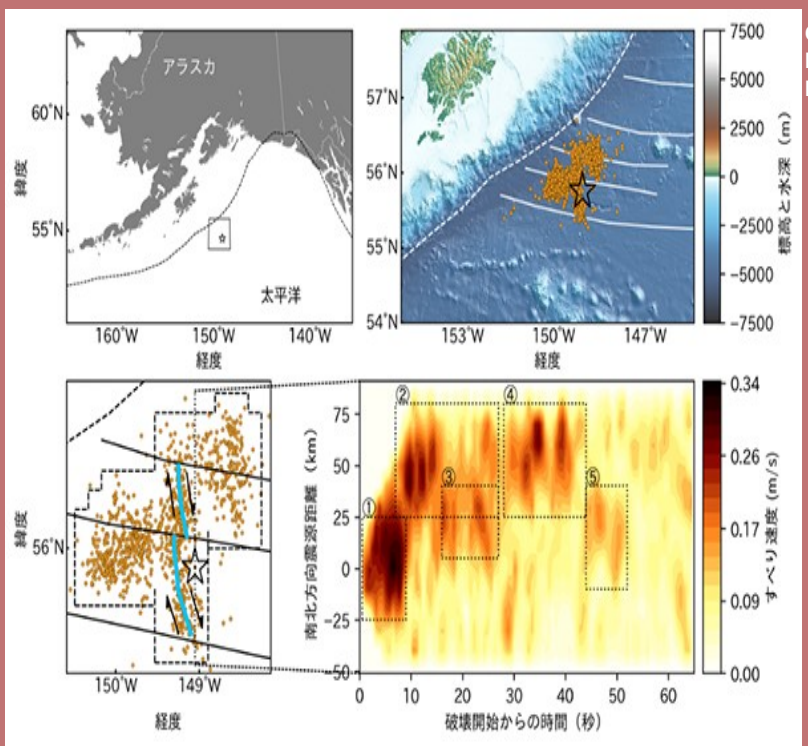
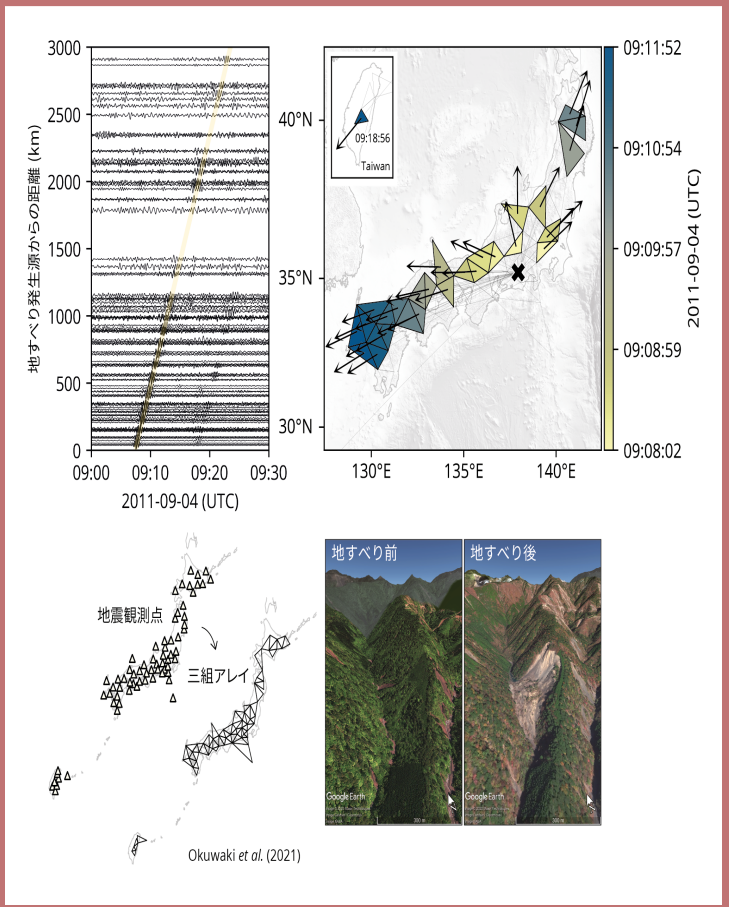


Consecutive Ruptures on a Complex Conjugate Fault System During the 2018 Gulf of Alaska Earthquake



Identifying landslides from continuous seismic surface waves: a case study of multiple small-scale landslides triggered by Typhoon Talas, 2011

The year 2020 has been one of the most challenging years in modern history and will be remembered for the disrupt it caused to our lives through the Covid-19 pandemic. Did we ever imagine when the corona virus broke out in 2019, it will bring the whole world to a standstill? The measures taken to combat the Covid-19 situation through the year and even now, have forced all of us to reflect on the past events, assess our day-to-day operations and forced us to take action to recalibrate our daily lives. Perhaps we were too complacent in our lives before Covid and need a bit of quaking to our equilibrium? Is this a wake-up call to us researchers to say how important our work is? How important it is now more than ever to share our data and work collegially to combat disaster risk and create a world resilient to disasters in order to bounce back with resilience to overcome these challenges.

In addition to adjusting to the pandemic age and wondering what a post-covid-era would be like, we are also astonished by the contrast between the speed with which it became a global pandemic and our efforts to combat the virus. While this pandemic, among other things, have shown us our resilience during this situation, it has also brought our attention to the undeniable fact that we need to throw our research net wider and broader to capture more research, realise the importance of data sharing, in particular, in health disasters, and other unknown disasters that may emerge in the future.

This situation has also revealed to us our ability to adapt to remote work, make use of various digital technology and other online platforms to carry out our daily tasks to circumvent the situation. Our ability to stand firm through this pandemic and come out resiliently and steadfastly to regain the quality of life is the challenge left to us now. We can only achieve this, if we all work together and collate our efforts towards the same goal.

In light of this pandemic situation, we have decided to hold the 5th Global Summit of GADRI virtually. We are sharing information on title and session will be held during the summit. We count on your support and cooperation to make this summit a success.

We wish you all the very best and good health. Take care of yourselves.

Hirokazu Tatano and the Secretariat of GADRI

Contents

Photos on the cover page are taken from articles provided by the respective authors.

GADRI Actions is designed, formatted and edited by Hirokazu Tatano and Wilma James.

Discussions for Sustainable Futures

By: TZIOUTZIOS Dimitrios

Doctoral Student

Disaster Risk Management Lab, Disaster Prevention Research Institute (DPRI)

Graduate School of Engineering, Kyoto University

13 April 2021

The main idea of this discussion series is to invite early-career researchers, practitioners (e.g., civil society, NGOs, government), senior faculty and students from different university schools to join in an hourly, casual 'coffee' talk. Our purpose is to initiate an on-going, informal dialogue on an equal basis among people from various disciplines and perspectives to think together about the processes needed to move towards more just and equitable sustainable futures in different contexts, cultures, and communities in the world. Through our discussions over the past few months, an overarching theme developed: *emergent social innovation and adaptive governance for coping with the systemic risk of unsustainability*.

In our latest discussion session, we approached the subject of 'emergent social innovation in the face of crises'. We began by exploring how the concepts of 'innovation' and 'crisis' are broadly understood nowadays, looking at their relationship with environmental sustainability or even the pandemic. From the perspective of resilience, innovation is regarded as a process of combining available skills and resources. It is not only an invention but also a social adaptation process in a broader sense.

Our talk highlighted the need to establish mechanisms to nurture and implement social innovation by enabling the communities to identify themselves the problems they face, something that still remains quite challenging. In this regard, it is important to promote critical thinking in education through encouraging new learners to ask questions, re-evaluate our assumptions and contemplate on what might still be missing from the analysis framework.

Furthermore, we must foster social innovation by supporting social communication. New 'communicative spaces' are thus required to facilitate community members in meeting, discussing and collaborating together. We should bear in mind going forward that social changes can start at a small, manageable scale, without being large and disruptive projects. Ideas can develop in size and mature gradually through the continuous innovation process, given our communication and collaboration networks.

Another challenge ahead for innovation is bringing equality in communities with limited resources. There are issues related to power dynamics within our society, and so we need to make sure that the communities act having all people in mind. In this regard teaching and preparing the future generations is key, and —perhaps more importantly— we have to start considering them not only as students, but as partners and educators in the social innovation process.

Finally, looking towards mainstreaming social innovation, we need to research and highlight successful examples without disregarding, however, the less successful cases that can provide equally valuable lessons in realizing and fostering social innovation.

The 5th International Symposium on Natural and Technological Accident Risk Reduction at Large Industrial Parks (5th Natech Symposium / Natech 2021)

By: Ana Maria Cruz, Ph.D.

Professor

Disaster Prevention Research Institute (DPRI), Kyoto University

On March 10-11, 2021, we held the 5th International Symposium on Natural and Technological Accident Risk Reduction at Large Industrial Parks (5th Natech Symposium - Natech 2021). This international event was hosted by Prof. Shin-ichi Aoki, Osaka University, and Prof. Ana Maria Cruz, Kyoto University.

The consequences of past natural hazard triggered technological accidents (known as Natechs) have highlighted the vulnerability of modern societies to these complex accident risks. Addressing the risk posed by Natechs requires comprehensive, area-wide efforts that go beyond one plant, or a single industrial park to the wider community of stakeholders in which industries carry out their production, processing, distribution, and operations. But this “ideal” state, requires a paradigm shift, and not only on behalf of industrial facility managers and operators, but all relevant stakeholders towards comprehensive, territory-wide risk assessment and management. This requires new, proactive approaches with a broader scope. Therefore, by bringing in knowledge and methods from different disciplines, new points of view and approaches will support a clearer understanding of Natech complexities, and improved ways to manage the challenges they entail.

Thus, the 5th Natech Symposium aimed to promote scientific exchange from interdisciplinary fields to share experiences on risk management and risk governance of Natech hazards, and risk assessment methods and innovative risk reduction measures on various accident hazards triggered by large-scale natural disasters at industrial parks. The symposium brought together more than 100 participants from academia, local, national and international government organizations, industry and local community leaders from 26 countries from all over the world. The two-day event was held online with plenary and research sessions, as well as panel and discussion sessions organized in a way that allowed participants from different time zones to actively engage. In total, thirty-five oral presentations regarding current research advances, as well as challenges regarding all aspects of Natech risk management and risk governance were presented. The symposium also offered a space for multistakeholder discussion and cooperation regarding Natech risk reduction.

The 5th Natech Symposium followed a series of international events. The first, second and third Natech symposia were hosted by Osaka University in cooperation with the Disaster Prevention Research Institute of Kyoto University, Japan, in 2015, 2016, and 2017. The 4th Natech symposium was hosted at the Joint Research Centre, European Commission, Italy in September 2018. The 2019 event, which was to be held in Kyoto in March 2020 (as part of the 2019 academic year in Japan) had to be postponed due to the ongoing coronavirus pandemic. This year’s symposium, held virtually on 10-11 March, offered new possibilities to reach out to stakeholders who would otherwise not be able to attend due to time and resource constraints. We hope that the symposium may contribute to collaboration among researchers, administrative bodies, industries and communities, which we hope can ultimately lead to safer and more resilient territories.

For more information, please visit the following URL: https://www.natech.dpri.kyoto-u.ac.jp/

Research Article on the Short-term Interaction Between Slow-slip Events and Devastating Earthquakes in Mexico

By: Associate Professor Yoshihiro Ito, Associate Professor Takuya Nishimura, Disaster Prevention Research Institute, Kyoto University and their colleagues in National Autonomous University of Mexico, University of Rhode Island, and University of California, Santa Cruz

Associate Professor Yoshihiro Ito, Associate Professor Takuya Nishimura, Disaster Prevention Research Institute, Kyoto University and their colleagues in National Autonomous University of Mexico, University of Rhode Island, and University of California, Santa Cruz, analyzed crustal deformation from GNSS stations in Mexico, as an international collaborative research project to identify slip distribution of slow slip events and interpolate coupling on the plate interface between Cocos and North America plates. As a result, it was clarified that an interaction among three large earthquakes with magnitude larger than 7 and slow slip events occurred in Mexico from 2017 to 2019. Slow slip events sometimes trigger a large earthquake, and a large earthquake conversely triggers slow slip. These triggering of large earthquakes by the slow slip events and those of slow slip by large earthquakes have been individually reported in several regions. There have been, however, few studies that have investigated the interaction among some of the large earthquakes and slow slip events in detail.

Part of this international collaborative research between Japan and Mexico was supported by JST and JICA with SATREP "Integrated Research for Mitigating Mega-Earthquake and Tsunami Hazards in Coastal Mexico" (PIs: Y. Ito, Kyoto University and V.M. Cruz-Atienza, UNAM).

These results were published in Nature Communications on 12 April 2021.

Abstract of the Article: https://www.nature.com/articles/s41467-021-22326-6

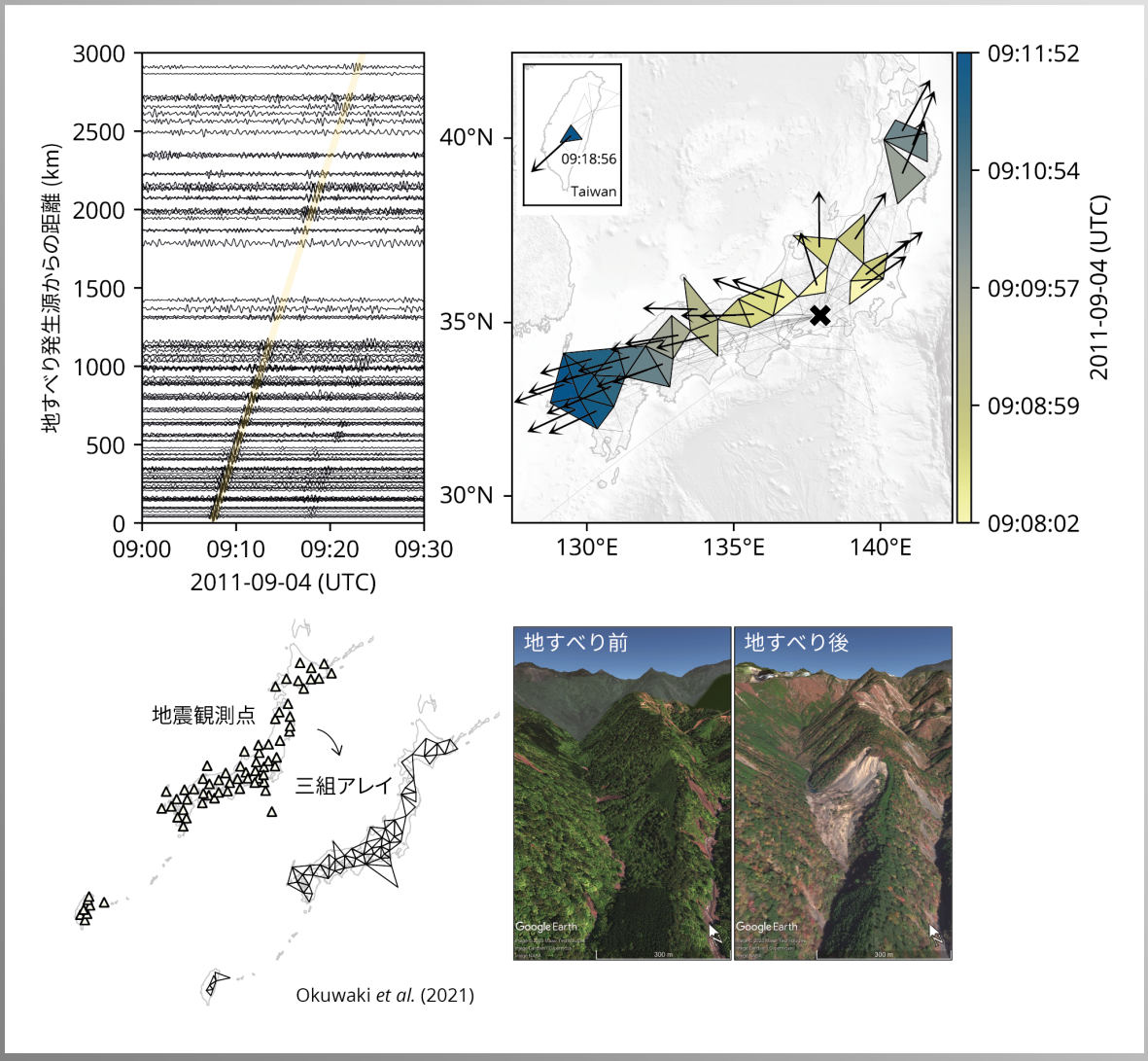
“Either the triggering of large earthquakes on a fault hosting aseismic slip or the triggering of slow slip events (SSE) by passing seismic waves involve seismological questions with important hazard implications. Just a few observations plausibly suggest that such interactions actually happen in nature. In this study we show that three recent devastating earthquakes in Mexico are likely related to SSEs, describing a cascade of events interacting with each other on a regional scale via quasi-static and/or dynamic perturbations across the states of Guerrero and Oaxaca. Such interaction seems to be conditioned by the transient memory of Earth materials subject to the “traumatic” stress produced by seismic waves of the great 2017 (Mw8.2) Tehuantepec earthquake, which strongly disturbed the SSE cycles over a 650 km long segment of the subduction plate interface. Our results imply that seismic hazard in large populated areas is a short-term evolving function of seismotectonic processes that are often observable.”

- Nature Communications - https://www.nature.com/articles/s41467-021-22326-6

Research Paper on Identifying landslides from continuous seismic surface waves: a case study of multiple small-scale landslides triggered by Typhoon Talas, 2011

By Prof. Masumi Yamada et.al.

The research paper on “Identifying Landslides from Continuous Seismic Surface Waves: A Case Study of Multiple Small-scale Landslides Triggered by Typhoon Talas, 2011” was published in the Geophysical Journal International (Oxford Academic) on 1st April 2021.



The summary of the paper is as follows:

https://academic.oup.com/gji/advance-article-abstract/doi/10.1093/gji/ggab129/6207938?redirectedFrom=fulltext#233608559

“Landslides can cause devastating damage. In particular, heavy rainfall-triggered landslides pose a chain of natural hazards. However, such events are often difficult to detect, leaving the physical processes poorly understood. Here we apply a novel surface-wave detector to detect and locate landslides during the transit of Typhoon Talas 2011. We identify multiple landslides triggered by Typhoon Talas, including a landslide in the Tenryu Ward, Shizuoka prefecture, Japan, 400 km east from the typhoon track. The Tenryu landslide displaced a total volume of 1.2-1.5 × $10^{\wedge 6}$ m. The landslide is much smaller than those detected by using globally recorded surface waves, yet the event generated coherent seismic signals propagating up to 3000 km away. Our observations show that attributes of small and large landslides may follow the same empirical scaling relationships, indicating possible invariant failure mechanisms. Our results also suggest an alerting technology to detect and locate landslides with a sparse seismic network.”

- Geophysical Journal International, (Oxford Academic) - https://academic.oup.com/gji/advance-article-abstract/doi/10.1093/gji/ggab129/6207938?redirectedFrom=fulltext#233608559

- https://academic.oup.com/gji/advance-article/doi/10.1093/gji/ggab129/6207938?login=true#233608559

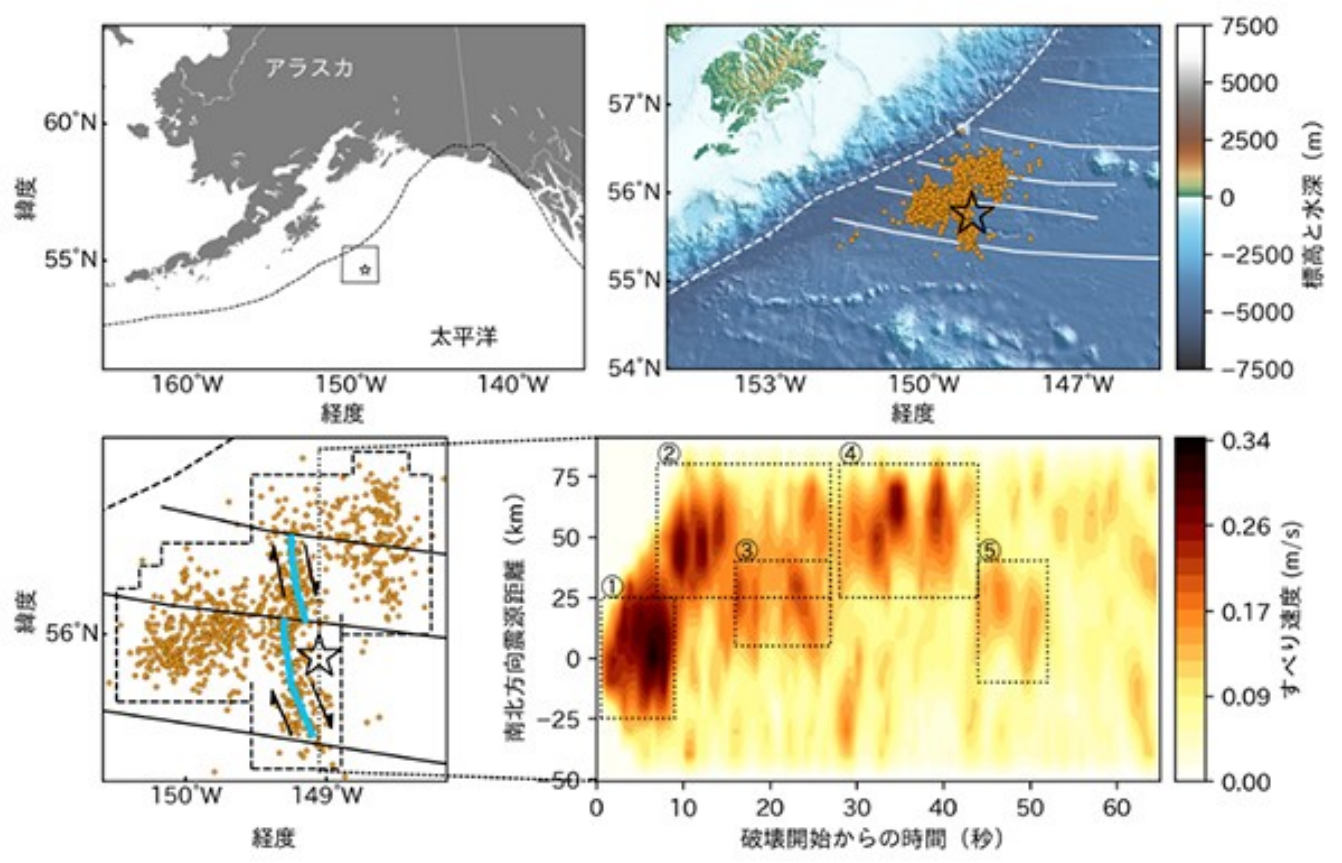
Volume 226, Issue 2

August 2021

Scientific Report on Consecutive Ruptures on a Complex Conjugate Fault System During the 2018 Gulf of Alaska Earthquake

By: Prof. Yukitoshi Fukahata et.al.

Paper on the “Consecutive ruptures on a complex conjugate fault system during the 2018 Gulf of Alaska Earthquake” was published in the Scientific Reports volume 11 on 16 March 2021.



Abstract

We developed a flexible finite-fault inversion method for teleseismic *P* waveforms to obtain a detailed rupture process of a complex multiple-fault earthquake. We estimate the distribution of potency-rate density tensors on an assumed model plane to clarify rupture evolution processes, including variations of fault geometry. We applied our method to the 23 January 2018 Gulf of Alaska earthquake by representing slip on a projected horizontal model plane at a depth of 33.6 km to fit the distribution of aftershocks occurring within one week of the mainshock.

The obtained source model, which successfully explained the complex teleseismic *P* waveforms, shows that the 2018 earthquake ruptured a conjugate system of N-S and E-W faults. The spatiotemporal rupture evolution indicates irregular rupture behavior involving a multiple-shock sequence, which is likely associated with discontinuities in the fault geometry that originated from E-W sea-floor fracture zones and N-S plate-bending faults.

Link to the abstract:

- https://www.nature.com/articles/s41598-021-85522-w

5th Global Summit of GADRI : Engaging Sciences with Action

31st August to 2nd September 2021

Intercontinental Virtual Conference

http://gadri.net/summit/

With the unprecedented Covid-19 circumstances and an unforeseen future, the 5th Global Summit of GADRI will be organised virtually during the summer of 2021, from 31st August to 1st September 2021, with a hybrid mini-session proposed to be held in conjunction with the 70th Anniversary of the Disaster Prevention Research Institute (DPRI), Kyoto University in November 2021.

The GADRI 2021 summit aims at stock taking of progress and achievements in DRR research from its Members towards the targets of the Science and Technology Roadmap to implement the goals and priorities of the Sendai Framework. The programme will communicate academic science across scientific disciplines to policy makers and practitioners. It is an important aspect for academics to be aware how science can directly contribute to national and local disasters, for example, the current global pandemic COVID-19, earthquakes, volcanic eruptions, etc. Such situations prompt scientists' interventions, expertise, experience and the opportunity to share them with emergency managers in crisis situations.

This year's Global Summit is attentive to the necessary influence of the Global Alliance and its supporting regional Alliances on bringing the disasters research to bare on the outcomes of the UN Climate Change Conference of the Parties (COP26) COP26 taking place in Glasgow, November 2021.

The 5th Global Summit of GADRI recommendations, facilitated through the UK Alliance of Disaster Research, will be presented at the COP26 to be held in Glasgow, UK from 1-12 November 2021, as well as the UNDRR Global Platform for DRR: From Risk to Resilience: Towards Sustainable Development for All in a Covid-19 Transformed World to be held in Bali, Indonesia from 23 to 28 May 2022.

Background:

The biennial Global Summit Series was initiated by the Disaster Prevention Research Institute (DPRI), Kyoto University, Uji Campus, Kyoto Japan with the first Global Summit of Research Institutes for Disaster Risk Reduction session held in November 2011 during the same year a triple disaster – Great East Japan Earthquake and Tsunami devastated Japan in March 2011. The First Global Summit which brought together 52 research institutes involved in disaster risk reduction and management from around the world, proposed the establishment of an international network of disaster research fostered by DPRI, Kyoto University. This proposal was further endorsed by the Second Global Summit that took place at DPRI, Kyoto University soon after the UN World Conference on Disaster Risk Reduction, participated by 83 institutes, and established the Global Alliance of Disaster Research Institutes (GADRI) to support the Sendai Framework for Disaster Risk Reduction 2015-2030 agenda.

The Third Global Summit in March 2017 was successfully organized by GADRI with 102 institutes and 251 participants from around the world.

A few outcomes of the 3rd Global Summit included the launch of the Disaster Risk and Research: GADRI Book Series, proposal for publication of GADRI Prospectus, and GADRI's active participation and contributions to the UNISDR and other major conferences.

The 4th Global Summit of GADRI under the theme of Increasing the Effectiveness and Relevance of our Institutes was organised in March 2019 at DPRI, Kyoto University, Japan. It was attended by 107 institutes and 246 participants. The conference particularly contributed to the contextualization of the Science and Technology Roadmap for the implementation of the Sendai Framework Agenda. The conference recommendations were submitted to the UNDRR Global Platform 2019.

E-Poster Session:

All members of GADRI are requested to actively take part in the e-poster session especially young scientists are encouraged to submit an outline/ abstract of the posters along the lines of the on the proposed conference themes/group discussion sessions.

- Following are the details:
  1. GADRI Secretariat is calling abstracts for E-poster session of the 5th Global Summit of GADRI - http://gadri.net/summit/ - along the lines of the summit sub-theme and the discussion topics - http://gadri.net/summit/preparatory-process/group-discussion-sessions/. Papers are called from GADRI member institutions, especially young scientists, researchers, policy-makers, etc.
- GADRI members can utilize the e-poster session to present disaster reports, research results and their research achievements during the past two years, ongoing research projects and activities, and other related topics.
- Authors should submit the paper title with an abstract by the final deadline, 30th June 2021 which will be reviewed by the session conveners/GADRI Secretariat. Selected authors will be contacted by e-mail to prepare the poster for the e-poster session. Submission instructions:
- Link to submit abstracts: https://www.dropbox.com/request/Y4MWQKSBUjLf7aSIKWdA
- After the abstract is submitted, please do inform GADRI Secretariat - abstract-5thgs@dpri.kyoto-u.ac.jp.
- When submitting abstract/s, please use your full name as the file name.
- Once the 5th Global Summit registration is opened, you will be required to register with the same name.
- Members are encouraged to make optimum use of this occasion to showcase each institute's research work, achievements, and planned activities.
- GADRI Secretariat request dissemination of this information among colleagues, researchers, students and project members.

Networking with Institutions Session:

Currently, GADRI is able to boast of a membership of 207 member institutes in 53 economies. During the 5th Global Summit of GADRI, an opportunity is given to all of member institutes to interact closely with each other through the Networking with Institutes Session.

This session will provide institutes with opportunities:

- to network and connect with other institutes, and showcase each institute's resources; t
- o find potential partners among GADRI members
- to collaborate, and to engage and enhance ongoing or new research project activities.

For instance, some institutes may have their own methodologies, datasets, experimental equipment, computer resources, but lack users, application fields, in-situ data for validation, and other difficulties. Other institutes may have enough human resources (researchers) but many unsolved issues and in need of scientific knowledge, experience, experimental and observation equipment, and technological supports and vice versa.

This session will, in particularly, explore research seeds and needs and assist to realize the effective/ active collaboration among GADRI members.

In order to prepare for the session, those who are interested in this session are requested to submit a PPT slide to explain "Seeds & Needs" for collaboration; and expectation from a future partner within 300 words.

The deadline for submission of documents for the Networking with Institutes Session is 23rd July 2021.

Important Dates:

- Registration for the 5th Global Summit of GADRI: 31 July 2021
- Submission for the Networking with Institutions: 23July 2021
- Response to Questionnaire Survey: 23rd July 2021
- Abstracts for E-posters: 30 June 2021

Structure and the Themes of the 5th Global Summit

The virtual conference will start from 22:00 hours, JST 31st August 2021 and end at 01:00 hours JST of 2nd September 2021.

- Common Opening Session
- Americas covering North and South America – Prof. Paul Kovacs supported by Prof. Lori Peek and Prof. John van de Lindt
- Common Plenary Session
- Asia and Oceania – hosted by the GADRI Secretariat and supported by Prof. Mahua Mukherjee
- Europe covering Africa and the Middle-East – Prof. Jorgen Sparf supported by Prof. Andrew Collins, and Dr. Tom De Groeve
- Common E-poster and Networking with Institutes Session
- Common Closing Plenary and Wrap-up of the 5th Global Summit of GADRI

Every session will be audio and video recorded and uploaded immediately to the registered participants only summit web site.

Americas Covering North and South America

Host: Prof. John van de Lindt, Prof. Paul Kovacs and Prof. Lori Peek

Current Situation of Science Collaborations in Hazards DRR

- Keynote Speech
- Parallel Panel Sessions:

I. Enabling Resilience : Preventing Disasters in Hazard-Prone Areas

Co-Chair: Jamie Kraus, Liesel Ritchie (4 PPT @15min + 5 min Q&A)

II. Reducing Barriers for Scientists and Engineers to Enhance Resilience

Co-chaired by Robert Weiss, Virginia Tech & Rachel Davidson, University of Delaware (4 PPT @15min + 5 min Q&A)

III. Innovative Approaches in Disaster Resilience

Co-Chaired by Grace Yan, Brian Phillips Forrest and Xinyue Ye (8 PPT @ 15 min followed by 30 min Panel Discussion)

IV. Equitable Resilience: Addressing Social Justice in Disasters

Co-Chaired by Michelle Meyer, Dillard Maria K., Kim Klockow McClain, Sara Hamideh, Christine Gibb (8 PPT @ 15 min followed by 30 min Panel Discussion)

Asia and Oceania

Host: GADRI Secretariat supported by SAADRI, Prof. Mahua Mukherjee

Engaging Sciences with Action: Voices from Asia and Oceania

- Keynote Speeches (5 @ 20min)
- Parallel Panel Sessions:

1 Regional Alliances : Improving collaboration to support global stakeholders on DRR and DRM

Focal Points: Hirokazu Tatano, Norio Maki, Kenji Kawaike, Wei-Sen Li, Gretchen Kalonji (4-6 speakers)

2 Target E - Disaster Risk Governance and Contribution for Policy Making

Focal Points: Toshio Fujimi, Genta Nakano, Ritsuko Yamazaki-Honda, Dilanthi Amaratunga (4-6 speakers)

3 Contributions to Climate Change Adaptation

Focal Points:Tetsuya Takemi, Kenji Tanaka, Mahua Mukherjee; and Andrew Collins as Adviser (4-6 speakers)

4 Implementation of Sciences in Action

Focal Points: Subhajyoti Samaddar, Masamitsu Onishi, Yuki Matsushi, Gary Wilson, GNS, NZ, Yuichi Ono (4-6 speakers)

Europe covering Africa, and the Middle-East

Hosts: Dr. Jörgen Sparf, Prof. Andrew Collins, and Dr. Tom de Groeve

Exploring solutions to bridge the gaps for implementation of science in action

- Welcome Address
- Keynote Speeches (2 speakers)
- Panel Sessions:

1. Bridging the Collaboration Gaps : Integrating DRR and CCA for a Science in Action Agenda (4 speakers)
2. Bridging the knowledge Gaps: Exploring solutions for Transforming Data into Action (3 speakers)
3. Bridging the Science-Policy Gaps: Contextualising Governance to Explore Opportunities for Action (3 speakers)
4. Bridging the Generational Gap: Catalysing Science in Action by Youth Engagement (4 speakrs)

Parallel Sessions:

- Networking with Institutes;
- E-Poster Session

- Final Plenary—Achievements and Recommendations by Chairs form Each Regional Sessions
- Closing Ceremony

New Members of GADRI

University of Management and Technology (UMT), Center for Disaster Management

Lahore, Pakistan

The University of Management and Technology (UMT) was established in 1990 and has evolved into a premier institution of higher education in the country. Recognized by the Higher Education Commission (HEC) of Pakistan as a "W4" category (highest rank) university, UMT distinguishes itself with 400+ full-time faculty members including more than 200+ PhDs, 26,000+ alumni and 25,000+ students from Pakistan and various countries around the globe. The Center for Disaster Management established under the ambit of University of Management and Technology, Lahore, Pakistan has been mandated to lead research and education in the field of Disaster Management in Pakistan.

For further details, visit the website: http://cdm.umt.edu.pk/

University of Glasgow, National Centre for Resilience

Dumfries, United Kingdom

The University of Glasgow, National Centre for Resilience (NCR) is an academic research hub, using evidence to inform policy and practice. It bridges the gap between academia, policy and practice by promoting cross sector partnerships, encouraging each to learn from the other to improve resilience when planning for, responding to and recovering from natural hazard events in Scotland.

The NCR utilises existing knowledge, commissions demand led research projects and funds practical projects to address real life issues faced by resilience practitioners and communities. Using its networks, it creates links for researchers to help them adapt their project outputs into tailored briefings and tools for end users and then maximises the potential use and impacts of this work by disseminating research outputs.

For further details, visit the website: https://www.gla.ac.uk/research/az/ncr/

The University of Alabama, Center for Sustainable Infrastructure

Alabama, USA

The mission of the Center for Sustainable Infrastructure (CSI) is to conduct research associated with constructing, expanding, maintaining, and rehabilitating all aspects of physical infrastructure. The Center facilitates and leads multi-disciplinary, collaborative programs and explores linkages between different infrastructure systems that are traditionally studied in separate specialty areas. The Center is particularly focused on the safe and efficient creation of resilient infrastructure, including assessment of infrastructure condition, vulnerability, and recovery from disaster. Four key research themes of the CSI are 1) multi-hazards community-based resilience, 2) energy simulation and retrofitting of buildings, 3) accelerated and automated construction, and 4) advanced materials for civil infrastructure. Its Large Scale Structures Laboratory (LSSL) contains a 75-foot by 40-foot test floor with a 3-foot thick strong floor, two 15-ton capacity overhead cranes, and 2-foot thick reconfigurable reinforced-concrete blocks that can be stacked and post-tensioned to the strong floor to provide reaction walls on the testing floor. The sponsors of research projects include National Science Foundation, Federal Highway Administration, National Institute of Standards and Technology, Department of Defense, Department of Energy, State DOTs, and the industry.

For further details, visit the website: https://csi.eng.ua.edu/

GADRI Members

Established in March 2015, the Global Alliance of Disaster Research Institutes support the implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030 (SFDRR) and the work of the Scientific and Technical Advisory Group of the United Nations Office for Disaster Risk Reduction (UNDRR).

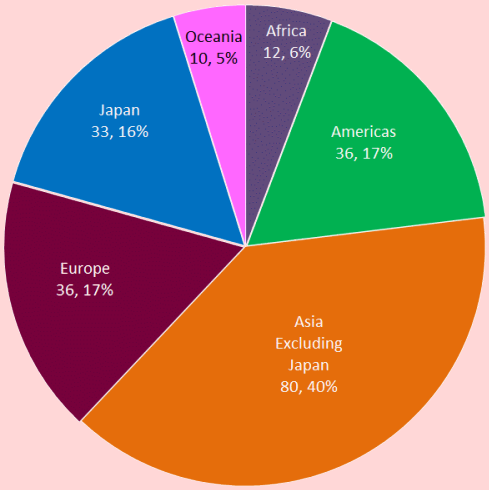
In line with its vision, GADRI strives to deepen the understanding of disasters and find implementable solutions to achieve disaster resilience; i.e. human, technical system and infrastructure resilience, survivability and well-being, by integrating knowledge and technologies from around the world. Over 200 institutions have joined GADRI.GADRI membership is free; and completely voluntary and non-binding.

GADRI Secretariat is currently headquartered and hosted by the Disaster Prevention Research Institute (DPRI), Kyoto University, Kyoto, Japan.

To join GADRI, please contact the GADRI Secretariat: secretariat-gadri@dpri.kyoto-u.ac.jp

Geographical Distribution of GADRI as of 30 April 2021

Area	Members	Economies
Africa	12	**7**
Americas	36	**8**
Asia (Excluding Japan)	81	**23**
Europe	36	**12**
Japan	33	**1**
Oceania	10	**2**
Total Institutes	**208**	**53**
	53 economies	



GADRI
Global Alliance of
Disaster Research Institutes

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