12th DPRI Award

for Outstanding Contributions
in Research Cooperation

研究協力貢献賞

Prof. Charles Scawthorn

University of California Barkeley
Pacific Earthquake Engineering Research Center (PEER)

選考経緯・業績紹介・講演資料

March. 18, 2026

DPRI Disaster Prevention Research Institute,
Kyoto University

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Congratulatory message to Prof. Charles Scawthorn

Prof. Hirokazu Tatano

It is with immense pride and joy that I congratulate you on receiving the DPRI Award. This prestigious accolade is a fitting tribute to your lifelong dedication to the Disaster Prevention Research Institute and your monumental contributions to global earthquake resilience which has not only defined the field of Disaster Risk Reduction (DRR) but has also contributed to mitigating efforts through tireless perseverance.

From our early days of observing fire suppression efforts during the 1995 Hanshin-Awaji Earthquake to his groundbreaking work on the seismic retrofitting of high-rise buildings, his impact is visible across the Japanese landscape. By assisting major Japanese insurance companies in managing commercial earthquake risks, Prof. Scawthorn bridged the gap between academic theory and national economic safety. He has never failed or waivered to lend his expertise and experience. He has consistently turned observation into action.

Beyond his technical brilliance, Prof. Scawthorn's philanthropic spirit and the mentorship provided to the DPRI and the Kyoto University community have built a legacy of cooperation that transcends borders.

Even in retirement, Prof. Scawthorn has remained an avid and prolific scholar and author. Prof. Scawthorn's unwavering dedication to documentation is evidenced by one of his recent co-authored research articles "Kantō Daikasai: The Great Kantō Fire Following the 1923 Earthquake" (Geoscience World, Oct 2023) provides a critical historical and technical analysis of one of Japan's most devastating urban fires which was released to mark the 100th year anniversary of the 1923 Great Kanto Earthquake. Related to the article, the lecture on "Recent Research Activities: An Overview and Extended Q&A Dialogue" delivered under GADRI Lecture Series, further illustrates his tireless commitment to sharing his wealth of knowledge with the global community.

We are all the safer for his work, and the title of DPRI Fellow is one Dr. Scawthorn has truly earned through decades of friendship and professional excellence.

Prof. Scawthorn's leadership at Kyoto University and the Disaster Prevention Research Institute (DPRI)—particularly in organizing the First International Conference on Asian Catastrophe Risk (1ICACI) and catalyzing the establishment of the Global Alliance of Disaster Research Institutes (GADRI)—has built a community to collectively contribute to the UNDRR Sendai Framework of Disaster Risk Reduction (SFDRR) and to a global infrastructure for safety that will endure for generations.

Recognizing that while DPRI is the oldest and largest research institute of its kind, there are many other research institutes for disaster research in the world, with little to no collective interaction or leadership, Prof. Scawthorn was a driving force in creating the Global Alliance of Disaster Research Institutes (GADRI). Now encompassing over 200 institutes worldwide, GADRI continues to benefit from his direction. Whenever we require a path forward, Prof. Scawthorn took the lead—from the timely Op-Ed on COVID-19 to his swift efforts to propose to organize a reconnaissance team from DPRI and organize a discussion session in the Global Summit of GADRI for the 2023 Türkiye Earthquake, taking leadership role in GADRI Committee on Networking and much more.

Beyond these academic milestones, I am personally grateful for our journey of friendship. He has been an invaluable mentor and adviser, always leading with a philanthropic spirit and staunch academic rigor.

The title of DPRI Fellow is a natural fit for someone who has spent a lifetime bridging the gap between the U.S., Japan and around the globe to create a more resilient world.

With deepest respect, admiration, and heartfelt congratulations,

Hiro

チャールズ・スコーソーン教授への祝辞

京都大学防災研究所　教授　多々納　裕一

このたびの DPRI Award のご受賞、心よりお祝い申し上げます。この名誉ある賞は、防災研究所への長年にわたるご献身と、世界の地震レジリエンス向上に対する多大なご貢献にふさわしいものです。教授のたゆまぬ努力は、防災・減災（DRR）の分野を形づくるだけでなく、災害軽減の実践にも大きく寄与してこられました。

1995 年阪神・淡路大震災における消火活動の観察に始まり、高層建築物の耐震補強に関する画期的な研究に至るまで、教授の足跡は日本の各地に刻まれています。日本の主要な保険会社に対し、商業地震リスク管理を支援されたことにより、学術理論と国家の経済的安全保障の架け橋を築かれました。教授は常に専門知と経験を惜しみなく提供し、観察を行動へとつなげてこられました。

卓越した技術的知見に加え、スコーソーン教授の慈愛に満ちた精神と、DPRI および京都大学コミュニティへの献身的な指導は、国境を越えて協働の精神を育む大きな遺産となっています。

ご退職後も、教授は精力的に研究と執筆を続けておられます。近著の一つである共著論文「関東大火災：1923 年地震後に発生した大火災」（Geoscience World, 2023 年 10 月）は、関東大震災から 100 年の節目に発表され、日本史上最も甚大な都市火災の一つについて、歴史的かつ技術的に極めて重要な分析を提供しています。また、GADRI Lecture Series での「Recent Research Activities: An Overview and Extended Q&A Dialogue」講演は、教授が世界のコミュニティに知識を共有し続ける強い使命感を改めて示すものです。

教授のご業績によって、私たちはより安全な社会を享受しています。DPRI Fellow の称号は、友情と専門的卓越性に満ちた数十年の歩みによって、まさにふさわしいものです。

京都大学および防災研究所（DPRI）における教授のリーダーシップ――特に第 1 回アジア巨大災害リスク国際会議（1ICACI）の開催や、世界防災研究所連合（GADRI）の設立を推進されたこと――は、UNDRR 仙台防災枠組（SFDRR）に貢献し、世代を超えて続く安全のための国際的基盤を築くことにつながりました。

DPRI が世界最古かつ最大規模の防災研究機関である一方、世界には多くの防災研究機関が存在しながら、相互の連携やリーダーシップが十分でない状況を認識し、教授は GADRI 創設の原動力となりました。現在、GADRI は世界 200 以上の研究機関を擁し、教授の指導のもと発展を続けています。COVID-19 に関するタイムリーなオピニオン記事の執筆、2023 年トルコ地震に対する DPRI 調査団の提案と GADRI Global Summit での議論の主導、Networking 委員会でのリーダーシ

ップなど、道が必要なときには常に教授が先頭に立ってくださいました。
これらの学術的功績を超えて、私自身は教授との友情の旅に深く感謝しています。教授は常に慈愛の精神と揺るぎない学問的厳格さをもって導いてくださいました。
DPRI Fellow の称号は、米国、日本、そして世界をつなぎ、より強靭な社会を築くために生涯を捧げてこられた教授にとって、まさに自然でふさわしいものです。
深い敬意と感謝をこめて、心よりお喜び申し上げます。

DPRI Award 設立の趣旨および

第 12回 DPRI Award 受賞者決定の経緯

研究教育担当副所長　境　有紀

防災研究所は、国内外で発生する自然災害を研究対象とすることから、国際交流協定の締結、国際共同研究、海外災害調査や留学生・海外共同研究者の受け入れなどの国際的な活動にも積極的に取り組んで参りました。平成22年度に認定され開始した共同利用・共同研究拠点は、令和 4 年度から3期目に入っています。また、防災研究所が事務局を務める世界防災研究所連合（GADRI）は令和5年3月に第6回世界防災研究所サミットを開催いたしました。このように防災研究所は頻発する国内外での自然災害に備えるための国際防災研究拠点として、その地位を確立するために、様々な新しい取り組みを推進しています。

これらの一環として平成23年3月に「京都大学防災研究所国際表彰規程」が制定され、DPRI Award が設立されました。その表彰の要件は

1）　防災研において、客員教員や共同研究者などとして滞在し、セミナーや共同研究などを実施し、防災研の研究教育に成果を上げた方
2）　防災研が主催する研究集会等において、基調講演、招待講演等を務め、又は企画運営に携わり、防災研の活動に貢献した方
3）　防災研が実施する国際共同研究及び現地調査等において貢献した方

となっております。

これまでの授与実績は以下の通りです。

- 第 1 回（平成 25 年度）：金森博雄博士（カリフォルニア工科大学名誉教授）
- 第 2 回（平成 26 年度）：フランシスコ・サンチェズセスマ博士（メキシコ国立自治大学教授）
- 第 3 回（平成 27 年度）： キース・ハイペル博士（ウォータールー大学教授）
- 第 4 回（平成 28 年度）： ミシェル・ジャボイエドフ博士（ローザンヌ大学教授）

および国際応用システム分析研究所（IIASA）リスク・レジリエンスプログラム

- 第５回（平成 30 年度）： ジョン・グレッグ・アンダーソン博士（ネバダ大学リノ校教授）
- 第６回（令和元年度）： アンドリュー・コリンズ博士（ノーサンブリア大学教授）
- 第 7 回（令和 2 年度）： 陳亮全（Liang-Chun CHEN）博士（台湾国立防災救助技術センター元センター長）
- 第８回（令和３年度）： ジェームズ・デニス・ゴルツ博士（コロラド大学ボルダー校客員研究員）
- 第 9 回（令和 4 年度）： ビクトール・マヌエル・クルス・アティエンツア博士（メキシコ国立自治大学教授）
- 第 10 回（令和 5 年度）： ピエー＝イーヴ・バード博士（グルノーブル・アルプ大学地球科学研究所上級研究員）
- 第 11 回（令和 6 年度）：イラセマ・アルカンタラ＝アヤラ博士（メキシコ国立自治大学地理学研究所教授）

今回、令和７年度の国際表彰について、令和８年1月に防災研究所の多々納教授から推薦があり、表彰選考委員会で慎重に審議しました。その結果、カリフォルニア大学バークレー校の名誉教授のチャールズ・スコーソーン博士に対し、第 12 回の防災研究所国際表彰 DPRI Award の「研究協力貢献賞」の受賞者として所長に推薦することを決定いたしました。その後、所長の承認を得、これを教授会に諮り承認されました。

チャールズ・スコーソーン博士は、クーパー・ユニオン大学を卒業後、リーハイ大学で理学修士号、京都大学で工学博士を取得されました。その後、サンフランシスコのデイムズ・アンド・ムーア法律事務所、EQE インターナショナル社を経て、2003 年～2008 年に京都大学教授を務められ、スタンフォード大学、北京師範大学、早稲田大学の客員教授を経て、現在はカリフォルニア大学バークレー校の名誉教授、客員研究員です。

博士は、自然災害および技術的災害リスクの分析・軽減における国際的権威であり、また、SPA リスク LLC の社長として、世界銀行やグローバル企業へ多大な専門的知見を提供してきました。特に京都大学防災研究所（DPRI）との連携は深く、長年

にわたり世界の地震防災研究をリードし続けています。

1980 年代半ばから、教授は将来の東海地震への備えとして米国地震工学研究所内に「予測東海地震委員会」を組織し、日米の研究者や実務家の相互理解を深める場を創出しました。このネットワークは、1989 年のロマ・プリエタ地震や1995 年の阪神・淡路大震災における迅速な日米合同調査の実現に大きく寄与しました。2003 年からは京都大学教授として地震防災研究室を率い、多くの学生やポスドクを指導するとともに、DPRI 初となる世界銀行資金の国際プロジェクトを主導し、世界規模の災害リスクデータベースやソフトウェアを構築されました。

現場での調査活動も精力的で、2004 年のインド洋大津波や新潟県中越地震、2011 年の東日本大震災など、大規模災害のたびにDPRIの調査チームを率い、ライフラインの被害調査や学術誌への特集号掲載などを通じて貴重な知見を共有してきました。また、ケンブリッジ大学やコーネル大学との共同研究関係を築き、2008 年にはDPRIと世界の保険業界を繋ぐ「第 1 回アジア大災害リスク国際会議」を開催するなど、学術界と実業界の橋渡しにも尽力されました。

最大の功績の一つは、世界中の災害研究機関を繋ぐ「世界防災研究所連合（GADRI）」の着想と創設です。多々納裕一教授らと緊密に協力し、現在 200 以上の機関が加盟する巨大な連合体へと発展させました。創設メンバーおよび諮問委員長として、GADRI 憲章の策定やブックシリーズの編集を主導し、現在も強力な支持者として貢献を続けています。

また、1970 年代の京都大学での博士研究に端を発する地震火災の研究は、現代の保険・緊急管理業界における大規模モデルの礎となっており、2023 年の関東大震災 100 周年に際しても最新の論文を執筆するなど、その情熱は衰えることがありません。

卓越した専門性と献身性、そして国際的なリーダーシップを兼ね備えたスコーソーン博士は、防災研究所の国際的な学際研究を牽引し、国際プレゼンスの向上に大いに貢献されてきました。スコーソーン博士には、これまでのご貢献に深く感謝するとともに、今後も受賞者に授与される終身称号の DPRI Fellow として、防災研究所の研究・教育に大所高所からご指導・ご助言いただければ大変ありがたく存じます。

Charles Scawthorn教授　御略歴

氏名：　Charles Scawthorn（チャールズ　スコーソーン）

称号：　Full Professor

国籍：　USA

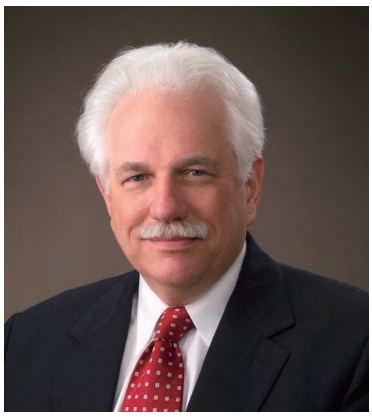
所属機関：University of California Berkeley, Pacific Earthquake Engineering Research Center（PEER）
（カリフォルニア大学バークレー校　太平洋地震工学研究センター）

専門分野：Disaster and Climate Change Risk Management/Finance Specialist, engineering, natural hazards, fire/blast, research, model development, and teaching.
（災害・気候変動リスク管理、地震工学）

CHARLES SCAWTHORN
Curriculum Vitae

744 CRESTON RD, BERKELEY CA 94708 USA

Citizenship: USA



SUMMARY: Professor, Disaster and Climate Change Risk Management/Finance Specialist, more than 40 years' experience in engineering, natural hazards, fire/blast, disaster and climate change risk management, research, model development, and teaching.

PROFESSIONAL EXPERIENCE

- **Disaster finance / risk management:** developed numerous disaster response and emergency management models, plans, scenarios/training; analysis for cat bonds and participated in development of sovereign disaster risk financing programs.
- **Climate Change**: analysis of CC impacts on flood, wildfire risk; development of CC adaptation strategies. More than 1,000 citations for "Scawthorn climate" on Google Scholar.
- **Structures:** analysis, design and testing of buildings, bridges, offshore platforms, aqueducts, buried pipe, underground tanks, electric transmission towers and foundations, variety industrial and energy structures.
- **Infrastructure**: network and systems analysis wide variety of infrastructure: water supply, electric, communications network vulnerability and reliability.
- **Hazard analysis:** probabilistic analyses for seismic, flood, drought, tsunami, wind, fire, explosion, terrorism.
- **Disaster response and field investigations** of major earthquakes, tropical cyclones, floods, fires, explosions and hazmat releases on five continents
- **Model and software development:** MH-Hazus Flood model; EQEHazard, MnhPRA etc. software
- **Academic**: Professor, Kyoto University, Japan; Visiting Professor: Stanford University, Waseda University (Tokyo), Beijing Normal University; Visiting Scholar, Univ. California at Berkeley
- **Publications**: Six major books and over 200 journal and conference papers
- **Communications:** invited speaker numerous conferences and symposia; many appearances on TV, in documentaries

EDUCATION

- Kyoto University, Japan: Ph.D. Earthquake Engineering, 1981
- Osaka University of Foreign Studies, Japan: Japanese language Cert.
- Lehigh University, Penn: M.S.C.E. Structural Engineering, 1968
- Cooper Union, N.Y.: Bachelor of Engineering, Civil Engineering, 1966
- Graduate courses in urban / regional planning, Univ. of California
- Certificates in *Protective Construction* (DOD) and *Security Vulnerability Assessment* (EPA/Sandia National Laboratory)

LANGUAGES: English (native); Japanese (good spoken, fair literacy)

REGISTRATIONS:

- California: Civil/Structural
- New York: Professional Engineer

SELECTED CLIENTS: World Bank, Asian Development Bank, GFDRR, FEMA, NCS, NSF, NIST, California OES, California Seismic Safety Commission, SFPUC, LADWP, CCWD, EBMUD, Metro Vancouver, Portland Water Bureau, Southern California Edison, Con Edison, BC Hydro, Japan Gas Association, Lloyd's of London, most global, US and Japanese insurers and reinsurers, Goldman Sachs, Norges Bank Investment Management…

INTERNATIONAL EXPERIENCE: North America: United States, Canada, Mexico, Haiti; **Asia**: China, India, Japan, Pakistan, Bangladesh, Sri Lanka, Bhutan, Philippines, Indonesia, Cambodia, Laos, Vietnam, Kazakhstan, Kyrgyzstan, Abu Dhabi, Saudi Arabia; **Australia**; **Oceania**: New Zealand, Fiji, Samoa; **Europe**: United Kingdom, Germany, Denmark, Norway, Netherlands, France, Italy, Poland, Russia, Turkey, Armenia; **Africa:** Morocco, Ghana, Egypt, Ethiopia.

PROFESSIONAL HISTORY

Charles Scawthorn is an academic, practicing structural engineer, and recognized authority in the analysis and mitigation of natural, climate change and technological hazards and risk. He serves as a Principal of SPA Risk LLC and as a Visiting Researcher at the University of California at Berkeley.

From 2003-2008 he was Professor of Infrastructure Risk Management in the Department of Urban Management, Kyoto University (Japan) and more recently has held Visiting Professorships in Tokyo, Beijing and at Stanford University (USA). He is currently Visiting Researcher at the University of California at Berkeley. In more than 30 years of experience Dr. Scawthorn has assessed facility, system, organizational, community and national risk due to natural and technological hazards and climate change, and developed integrated risk mitigation programs, in the US and internationally. Areas of significant activity include:

- Development and implementation of finance and insurance natural hazards risk models for the finance, insurance and real estate industries (Lloyds, Munich Re, AIG, Mitsui Sumitomo, Citibank, Bank of America…), MDBs (World Bank, Asian Development Bank) and sovereigns (Governments of United States, Canada, Mexico, Morocco, Kazakhstan…).
- National/regional assessments of infrastructure risk, for the World Bank, Asian Development Bank, FEMA, NCS, Calif. OES and other agencies in the US and for national governments, and major financial institutions internationally.
- Assessments of climate change impacts, benefits of climate resilient buildings and core public infrastructure, and impact analysis for the Canadian National Guide for Wildland-Urban Interface Fires including climate change.
- Major portfolio risks for multi-national insurance companies and national insurance programs.
- Enterprise-wide risk assessment for multi-nationals, regional loss assessments for regional and local governments.
- Assessment of CBNR (chemical, biological, nuclear and radiological) risk for multinational corporations.
- Structural analysis and design, and risk assessments, of critical facilities such as LNG plants and data processing and emergency operating centers.

He has provided risk consultation and structural engineering services for major regional planning projects in the United States, Latin America, Europe, Mid-east, Asia and Oceania.

Under funding from the Global Facility for Disaster Reduction and Recovery (GFDRR, an MDB facility), the National Science Foundation, the U.S. Geological Survey, FEMA and the insurance industry, Dr. Scawthorn has developed innovative approaches to estimating potential losses due to natural hazards, fires following earthquakes, optimizing urban land use with respect to natural hazards risk, general loss estimation models for earthquake, wind and flood, and seismically reinforcing low-strength masonry buildings. In the 1990s he led a major project for FEMA to assess the impacts of earthquakes on the US National Infrastructure, a similar project for the National Communications System to assess the impacts of earthquakes on the national communications infrastructure, and from 1998 to 2003 led the development of the US national flood model (HAZUS) for the National Institute of Building Sciences and FEMA. He is currently co-Principal Investigator on a major project for FEMA to assess the benefit-cost ratios for natural hazard mitigation. As part of that project, he has analyzed the US Wildland Urban Interface (WUI) fire risk, and benefit-cost ratios of code compliance for new and existing construction.

He has significant international experience, with major engineering projects in many countries, research projects in the US, Japan and with the Russian Academy of Sciences, and numerous development projects with the World Bank and Asian Development Bank (ADB). In many of

the latter projects he has worked closely with key Ministries, such as Finance, Housing, Planning and Public Works, as well as various national emergency response agencies. For the World Bank, he taught a seminal course on Disaster Risk Analysis, Mitigation and Finance, attended by over 200 Bank staff, and has developed professional development materials for the Bank and the World Bank Institute, and for ADB was part of an IEG group to assess the performance of the Asian Development Fund.

Dr. Scawthorn is well-known for developing the basic methodology for the analysis of potential losses due to Fire Following Earthquake. The methodology has been applied since the 1980s by the insurance industry and investigators worldwide. Much of his decision-oriented and emergency management work on the spread and mitigation of fires following earthquakes has been performed in conjunction with fire departments in California, particularly San Francisco, and the Pacific Northwest. He served on a Board of Inquiry investigating a firefighter fatality for the Oakland Fire Department.

He was the principal in the development of rapid assessment and/or visual screening of seismic vulnerability, including authoring a handbook and method for rapid visual screening of buildings for potential seismic hazards, developed in conjunction with the Applied Technology Council for use nationwide, for the Federal Emergency Management Agency. This methodology, originally developed in the late 1980s, has been applied to over 100,000 buildings in the US, and adapted by national agencies in Canada, Japan, Greece and other countries.

Dr. Scawthorn is the original author of the EQEHAZARD^{TM} software for seismic risk assessment which has spawned many derivative software tools for the global insurance industry and has played a leading role in several major software development projects – the US national flood model (HAZUS) for FEMA, the Morocco natural hazards Probabilistic Risk Analysis tool (MnhPRA) for the World Bank and Government of Morocco, and the GEM Taxonomy for the Global Earthquake Model.

He has investigated natural disasters in the United States, Canada, Mexico, Japan, New Zealand, China, Turkey, the former Soviet Union, Sri Lanka, Indonesia and Pakistan. He has led teams investigating the 2004 Niigata Chuetsu earthquake (Japan), Asian Tsunami on lifelines and 2011 Japan earthquake and tsunami. He has been a Consultant for the World Bank for the 2005 South Asian and 2010 Haiti Earthquake, 2007 Cyclone Sidr and other events.

He is a member of various professional organizations, has served on the Scientific Advisory Committee of the National Center for Earthquake Engineering Research, and the Editorial Boards of *Engineering Structures*, *Earthquake Spectra* (EERI), and the *Natural Hazards Review* (ASCE), and is regularly invited on television and radio, and to speak to professional organizations. He is a founder of the Global Alliance of Disaster Research Institutes (GADRI) and serves on its Advisory Board, is a member of the Fire Service Advisory Group (FSAG) of the Large Outdoor Fires & the Built Environment (LOF&BE) Working Group of the International Association for Fire Safety Science (IAFSS), and a member of the History Committee of the Earthquake Engineering Research Institute (EERI).

Dr. Scawthorn has authored over 200 technical papers covering risk analysis, natural hazards, post-earthquake fire spreading, and damage mitigation. He is the co-editor of the *Critical Urban Infrastructure Handbook*, *Human casualties in earthquakes: progress in modelling and mitigation*, the *Earthquake Engineering Handbook* (CRC Press) and *Fire Following Earthquake* (ASCE), and author of a major chapter on earthquake engineering for the *Structural Engineering Handbook* (CRC Press), co-author of a chapter on Geotechnical Earthquake Engineering for the *Bridge Engineering Handbook* (CRC Press), is co-editor of *Fire Safety in Tall Buildings*, and a contributor to the McGraw-Hill *Yearbook of Science and Technology*.

PROFESSIONAL CAREER

- SPA *Risk LLC,* Denver CO and Berkeley CA, Principal, May 2003-present
- *University of California at Berkeley*, Pacific Earthquake Engineering Research Center, Visiting Researcher and other positions, 2011-present
- *Kyoto University,* Dept. Urban Management, Japan, Professor, Dec 2003- March 2008[1]
- *EQE International and ABS Consulting*, Oakland, California, Senior Vice President, Aug 1987- May 2003[2]
- *Dames & Moore*, San Francisco, California, Associate, April1981- Aug 1987
- *Kyoto University,* Kyoto, Japan, Research Associate, April 1977- March 1981
- *Bechtel Corporation*, San Francisco, California, Senior Engineer, Aug 1974- Oct 1976
- *The Firm of Dermot Reddy*, New York, Design Engineer, March 1974 – Aug 1974
- *Earl and Wright*, San Francisco, Engineer, Oct 1973 – Dec 1973
- *Consolidated Edison Company of New York,* Engineer, Sept. 1968- April 1971

EDUCATION

- Kyoto University, Japan: Ph.D. Earthquake Engineering, March 1981
- Lehigh University, Pennsylvania: M.S.C.E. Structural Engineering, June 1968
- Cooper Union, New York: Bachelor of Engineering, Civil Engineering, June 1966
- Graduate courses in urban and regional planning, University of California
- Certificates in *Protective Construction* (DOD) and *Security Vulnerability Assessment* (EPA/Sandia National Laboratory)

PROFESSIONAL REGISTRATIONS

California
- Structural Engineer
- Civil Engineer

Washington
- Structural Engineer
- Civil Engineer

New York
- Professional Engineer

AFFILIATIONS AND HONORS

- Fellow, American Soc. Civil Engineers
- Earthquake Engineering Research Institute
- Seismological Society of America
- Structural Engrs. Assn. of Northern California
- Japan Soc. Civil Engineers
- Japan Assn. Earthquake Engg.
- Japan Soc. Natural Disasters
- Fritz Engineering Society

Senior Academic, Willis Research Network

Valued Team Member, Pakistan Earthquake Recovery Team, World Bank

Award For Extraordinary Achievement In Seismic Evaluation Of Buildings, Applied Technology Council

[1] Prof. Scawthorn's full time appointment ended 31 March 2008 due to attaining mandatory retirement age per University regulations.

[2] Dr. Scawthorn was a member of the senior management of EQE International, which was acquired by ABS International in 2000. Terms of the acquisition required him to remain with ABS for three years.

RECONNAISSANCE AND DAMAGE SURVEYS

Dr. Scawthorn has engaged in field investigation of a number of natural and technological disasters, for the purposes of understanding damage mechanisms, emergency response and social impacts, and training professional colleagues. Several of these site visits have involved data collection and/or assistance to local authorities. Specific incidents include:

Earthquake	2024 Noto Peninsula (Japan)	1994 Northridge
	2014 Napa	1993 Hokkaido Nansei (Japan)
	2011 Tohoku (Japan)	1992 Landers
	2010 Haiti	1989 Loma Prieta
	2009 West Sumatra	1988 Armenia
	2008 Wenchuan	1988 Saguenay (Canada)
	2007 Niigata Chetsu Oki (Japan)	1987 Whittier
	2005 South Asian (Pakistan)	1986 Edgecumbe (NZ)
	2004 Indian Ocean Tsunami	1986 North Palm Springs
	2004 Niigata Chuetsu (Japan)	1985 Mexico
	2001 Nisqually (Seattle)	1984 Morgan Hill
	1999 Marmara and Duzce (Turkey)	1983 Coalinga
	1995 Hanshin (Kobe, Japan)	1978 Miyagiken-oki (Japan)
Wind	2007 Cyclone Sidr (Bangladesh)	1992 Hurricane Andrew
	2005 Hurricane Katrina	1992 Hurricane Iniki
Fire / Blast	2025 Eaton Fire (Altadena)	1991 East Bay Hills
	2025 Pacific Palisades Fire	1990 Ruby Wildfire
	2017 LNU Complex / Tubbs Fire	1989 First Interstate Bank Bldg
	2010 San Bruno Gas Explosion	1984 Baldwin Hills (LA)
	1993 Southern California Wildfires	1982 Anaheim
Flood	2007 Cyclone Sidr (Bangladesh)	1997 Grand Forks
	2005 Hurricane Katrina	
Other	1992 Shasta Hazmat Spill	2010 Kyrgyzstan Civil Conflict

BOOKS AND MAJOR REPORTS

- Tunstall, S., M. Carr, and C. Scawthorn (2024) *Infrastructure Risk Management and Insurance in the Pacific.* Sydney: Pacific Region Infrastructure Facility (available here).
- Scawthorn, C., K. Porter (2022) *Effect of Major Stress Events on Buried Pipe Service Life*. Denver. Water Research Foundation, available here
- Butcher-Gollach, C., C. Scawthorn, D. Pourel, B. Banerjee, and S. Pradhan. 2023. *Toward More Livable Cities in the Hindu Kush Himalaya Region Lessons from the Nexus of Affordable and Seismic Resilient Housing in Bhutan, India-Himalaya Region and Nepal*. Manila, Asian Development Bank.
- Porter, K. A., C. Scawthorn, D. Sandink (2021). *An Impact Analysis for the National Guide for Wildland-Urban Interface Fires*. Inst. Catastrophic Loss Reduction, Toronto.
- Porter, K., C. Scawthorn (2020). *Estimating the benefits of Climate Resilient Buildings and Core Public Infrastructure.* Inst. Catastrophic Loss Reduction, Toronto.
- Hamada, M., T. Koike, T. Ono, T., C. Scawthorn, (2016). *Critical Urban Infrastructure Handbook*. CRC Press, Boca Raton, 584 pp.
- Spence, R., So., E. and Scawthorn C (2010). *Human Casualties in Earthquakes: Progress in Modeling and Mitigation*. Springer, London, 340 pp.
- Scawthorn, C., K. Kobayashi (2008) *Asian Catastrophe Insurance*. Risk Books, London. 350 pp.
- Chen, W.F., C. Scawthorn (2003). *Earthquake Engineering Handbook*. CRC Press, Boca Raton, 1500 pgs.
- Scawthorn, C., J. Eidinger and A.J. Schiff (2005) *Fire Following Earthquake*. ASCE, Reston.
- Barnett, C., Sfintesco, D., Scawthorn, C., Zicherman, J.B. (1992) *Fire Safety in Tall Buildings*. Council on Tall Buildings, Bethlehem. 340 pp.

Selected Reports

- With Holzer, T. et al. 2003. *The Plan to Coordinate NEHRP Post-Earthquake Investigations*, USGS Circular 1242, , USGS Western Region, Menlo Park CA
- With Porter, K.A. et al. 2002. *Improving Loss Estimation for Woodframe Buildings*, Final Report on Tasks 4.1 and 4.5 of the CUREE-Caltech Woodframe Project, Richmond, CA.
- With C. Rojahn, et al. 2000. *Database on the Performance of Structures near Strong-motion recordings: 1994 Northridge, California, Earthquake*, ATC-38. co-principal investigator. Applied Technology Council, Redwood City CA.
- With C. Rojahn, et al. 2002. *Rapid Visual Screening of Buildings for Potential Seismic Hazards: A Handbook, 2ND Edition*, FEMA 154, Washington DC
- With C. Rojahn, et al. 1991. *Seismic Vulnerability and Impact of Disruption of Lifelines in the Conterminous United States*, FEMA 224, Washington DC, 486pp
- With Johnson, G.S., et al. 1999. *Seismic Reliability Assessment of Critical Facilities: A Handbook, Supporting Documentation and Model Code Provisions*, Tech. Rept. MCEER – 99-0008, Multi-disciplinary Center for Earthquake Engineering Research, SUNY-Buffalo.

A complete list of publications is available on request.

While at Kyoto University, Prof. Scawthorn supervised 19 undergraduate and 19 M.S. theses, one doctoral student and one post-doctoral researcher.

INFRASTRUCTURE

- Fire Following Earthquake Water Requirements study, San Francisco Public Utility Commission
- Effect of Major Stress Events on Buried Pipe Service Life, research funded by the Water Research Foundation, Denver CO
- Co-Principal Investigator, Mitigation Saves 2.0, report prepared by the National Institute of Building Sciences, funded by the Federal Emergency Management Agency.
- Planning level fire following earthquake model for the City of Los Angeles, prepared for the Los Angeles Department of Water and Power.
- Assessment of Water Supply Network Seismic Vulnerability, Portland, OR
- Assessment of Enterprise Facility Seismic Risk, major US Electric utility
- Water Supply in Regard to Fire Following Earthquakes, California Seismic Safety Commission (and Pacific Earthquake Engineering Research Center)
- Pipeline Testing Program, AWSS, San Francisco Department of Public Works
- Technical Advisor, Planning Support Services for Auxiliary Water Supply System (AWSS), San Francisco Public Utilities Commission
- Multi-hazard risk assessment for Water Transmission and Distribution Systems, Sonoma Water Agency, Santa Rosa CA
- Multi-hazard risk assessment for Hetch Hetchy and related Water Transmission and Distribution Systems, Public Utilities Commission, San Francisco CA
- Multi-hazard risk assessment for Water Transmission and Distribution Systems, Portland Water Bureau, Portland OR
- Development of a methodology for the design of buried pipelines in soils subject to liquefaction, for the Japan Gas Association.
- City and County of San Francisco soils study project, for which he was Principal-in-charge for estimating damage to City of San Francisco-owned water supply systems (AWSS and MWSS) following a magnitude 8.3 earthquake on the San Andreas Fault. This study developed geotechnical, structural, systematic, and operational approaches for mitigation of potential damage in regions of potential soil liquefaction.
- Analysis and of earthquake effects on Contra Costa Water District, California, water system, for earthquake and other stress events; development of mitigation measures, including strengthening and design of robust and redundant system features.
- Seismic reliability consultation on design of False Creek and Coal Harbor Pumping Plants, Dedicated Fire Protection System, Vancouver, B.C.
- Analysis of seismic vulnerability, Vancouver Waterworks, City of Vancouver, B.C.
- Analysis of seismic vulnerability, Water Transmission System, Greater Vanouver Regional District, B.C.
- Analysis of electric system seismic vulnerability, B.C. Hydro, Vancouver, B.C.
- Analysis of electric system seismic vulnerability, Large Eastern US Electric Utility.
- Analysis of telecommunications system seismic vulnerability, National Communications System, Washington D.C.
- Seismic Analysis and System Design, Dual-Use Reclaimed Water System, Dept. Public Works, San Francisco CA.
- Analysis of design of System upgrades, Auxiliary Water Supply System, San Francisco Fire Department, San Francisco, CA.

- Stress Analysis, Water Transmission Tunnel, Colorado
- Analysis of Seismic Impacts and Disruption of Lifelines, National Lifelines Systems, for Federal Emergency Management Agency.

FIRE SERVICE -RELATED ACTIVITIES

- Study of Fire Following Earthquake Losses for the Lower Mainland of British Columbia, for the Institute for Catastrophic Loss Reduction, Toronto, CA
- Study of Fire Following Earthquake Losses for Montreal Region, for the Institute for Catastrophic Loss Reduction, Toronto, CA
- Planning level fire following earthquake model for the City of Los Angeles, prepared for the Los Angeles Department of Water and Power.
- Instructor, Fire Department Instructor Course, Sacramento CA,
- Member, Board of Inquiry, Building Collapse, 3052 Broadway, Oakland Fire Department, 1999.
- Co-Editor, Fire Safety in Tall Buildings, Council on Tall Buildings and Urban Habitat, Bethlehem
- Analysis of fire following earthquake risk, Dept. Building Inspection, City of San Francisco, 2010
- Development of new ignition algorithms for HAZUS, for the National Institute of Building Sciences and the Federal Emergency Management Agency, 2006
- Analysis of Fire Following Earthquake for the Southern San Andreas Fault M 7.8 Earthquake (SoSAFE) Scenario, for the U.S. Geological Survey, 2008
- Analysis of risk due to Post-Earthquake Fires, Los Angeles, San Francisco and selected other regions, for AIRAC, and the National Committee on Property Insurance.
- Earthquake Planning Study, Waterworks Branch, Engineering Dept., City of Vancouver, B.C.
- Seismic Reliability Analysis, design of Dedicated Fire Protection System, City of Vancouver, B.C.
- Analysis of earthquake effects and development of strengthening schemes for 78 municipal facilities for the City of Seattle, including six high-rise buildings, the Seattle Opera House, Seattle Arena, several historic buildings, and police and fire stations.
- Analysis of earthquake effects and development of strengthening schemes for 55 facilities of the San Francisco Fire Department, including 41 active fire stations, two major pump stations, and related facilities of the Auxiliary Water Supply System.
- Analysis and of system reliability, various water systems including Portland OR, San Francisco CA, Contra Costa CA, for earthquake and other stress events; development of mitigation measures, including strengthening and design of robust and redundant system features.
- Development of a methodology for the design of buried pipelines in soils subject to liquefaction, for the Japan Gas Association.
- Analysis of seismic vulnerability, Water Transmission System, Greater Vancouver Regional Dist., B.C.
- Analysis of telecommunications system seismic vulnerability, National Communications System, Washington D.C.
- Analysis of Seismic Impacts and Disruption of Lifelines, National Lifelines Systems, for Federal Emergency Management Agency.

SELECTED FIRE-RELATED PUBLICATIONS

Lee, S., Davidson, R., Ohnishi, N., and Scawthorn, C. (2008). "Fire Following Earthquake - Reviewing the State-of-the-Art of Modeling." Earthquake Spectra, 24(4), 933-967pp.

Kubo, M., Ono, Y., and Scawthorn, C. (2008). "Modeling of Fire Spread in GIS Framework." *(in preparation)*.

Scawthorn, C. (2008). "A Note on Fire Following Earthquake for the Southern San Andreas Fault M 7.8 Earthquake (SoSAFE) Scenario." SPA Risk LLC, prepared for the United States Geological Survey, Pasadena CA.

Scawthorn, C., Eidinger, J. M., and Schiff, A. J. (2005). "Fire Following Earthquake." Technical Council on Lifeline Earthquake Engineering Monograph No. 26, American Society of Civil Engineers, Reston, 345pp.

Scawthorn, C., O'Rourke, T. D., and Blackburn, F. T. (2006). "The 1906 San Francisco Earthquake and Fire---Enduring Lessons for Fire Protection and Water Supply." *Earthquake Spectra*, 22(S2), S135-S158.

Scawthorn, C. (2003). "Fire Following Earthquakes." Earthquake Engineering Handbook, W. F. Chen and C. Scawthorn, eds., CRC Press, Boca Raton.

Scawthorn, C., T. D. O'Rourke, F. T. Blackburn. (2006). "The San Francisco Earthquake and Fire of 1906 – Enduring Lessons for Fire Protection and Water Supply." *100th Anniversary Special Issue of Earthquake Spectra*.

With A. Cowell et al, 1998. Fires following the January 17, 1994 Northridge Earthquake, Proceedings, 6th US National Conference on Earthquake Engineering, Aug. 1998, Seattle.

"A Model for Urban Post-Earthquake Fire Hazard." 1981. *Disaster: The International Journal of Disaster Studies and Practice* (London) 5, no. 2: 125-132.

INSURANCE AND FINANCE INDUSTRIES

Dr. Scawthorn has been an innovator in the analysis and development of mitigation approaches to large property portfolios, for the last twenty years. This has involved research funded by the National Science Foundation and the Insurance Industry, as well as numerous projects for individual or company consortia. Selected projects include:

- Analysis of earthquake loss potential and development of loss reduction approaches involving portfolio management schemes, for US and foreign risks, for numerous insurance including American International Group, CIGNA, State Farm, Allstate, Allendale Mutual, Firemans Fund, Hartford Steam Boiler, Farmers, various Lloyd's syndicates, Royal Insurance Co., Allianz, Flagstone Re, Generali, General Re, Munich Re, Partner Re, Tokio Marine, Yasuda Fire, Mitsui Sumitomo Insurance, Koa, Nippon and other companies.
- Analysis of earthquake risk and development of loss reduction approaches, for various financial institutions, banks and mortgage holders, including Bank of America, Wells Fargo, Citibank and others.
- Planning and development of an enterprise loss estimation software package, for a major insurer
- Development of hazard and vulnerability data, for US, Japan, Philippines, for a major global reinsurer
- Analysis of flood losses and development of a national flood insurance scheme, for an eastern European nation, for the World Bank
- Analysis of natural hazards risk for national governments, for the nations of Mexico, Philippines, Cambodia and a number of central Asian states, for the World Bank
- Analysis of losses due to natural hazards, in support of corporate dynamic financial modeling, for a large Japanese insurance company
- Review of major art collections in California, for a Lloyd's Syndicate.
- Analysis of fire following earthquake, in California, Pacific Northwest, Central USA, for a major US insurance consortium, Similar analyses for various individual insurance companies, and also for foreign locales, including Chile, New Zealand, Japan.
- Analysis of reinsurance risk due to earthquake and/or hurricane, for various major reinsurers, and for various Lloyd's Syndicates.
- Development of methodologies for estimation of inland marine cargo cover natural hazards risks, for various insurance companies, for application in California and Japan.
- Numerous reviews of individual buildings, for insurers and financial institutions.
- Development of methodology for estimation of potential insured losses to industrial risks and/or petrochemical facilities, due to fire following earthquakes, for major industrial insurers, including Allendale Mutual Insurance Co., Starrtech division of AIG, and Hartford Steam Boiler Company.

- Analysis of potential losses for the nation of Iceland National Catastrophe Insurance program, for a consortium of London insurers.
- Confidential Review of regional loss projections, for the Office of the Auditor General, for a sovereign nation.

STRUCTURAL ANALYSIS AND DESIGN

- Forensic investigation of fire-related building collapse and fatality, and member of Board of Inquiry, Oakland Fire Department, Oakland CA
- Seismic analysis, Arecibo Radio Observatory (Puerto Rico), for Cornell University (world's largest radio telescope)
- Analysis of earthquake effects and development of strengthening schemes for 78 municipal facilities for the City of Seattle, including six high-rise buildings, the Seattle Opera House, Seattle Arena, several historic buildings, and police and fire stations.
- Analysis of earthquake effects and development of strengthening schemes for 55 facilities of the San Francisco Fire Department, including 41 active fire stations, two major pump stations, and related facilities of the Auxiliary Water Supply System.
- Development of earthquake damage and loss-of-functionality estimates for two aluminum smelting facilities. Aggregate value of improvements for the two plants was approximately $900 million.
- Seismic analysis of appurtenant structures at the Lower Crystal Springs Reservoir for the City of San Francisco.
- Design and analysis, pre-stressed concrete foundations for nationally critical EHV electric transmission steel pole line.
- Design and analysis EHV electric transmission towers, substations, and appurtenances.
- Structural design of commercial buildings, New York area.
- Structural design of water treatment structural, Riyadh Airport, Saudi Arabia.
- Structural design of underground high-level waste tanks, Nuclear Fuel Reprocessing Plant, South Carolina.
- Structural design of nuclear fuel reprocessing plant, South Carolina.
- Analysis of EHV electric transmission line Hudson River Crossing, for tornado effects, New York.
- Analysis of nuclear containment structure, for effects of impact of collapsing EHV electric transmission tower, New York.
- Analysis of unreinforced concrete water aqueduct, for effects of new EHV electric transmission tower foundations, New York.
- Stress and deformation analysis of a thin-walled large diameter water transmission pipe/tunnel section, for as-built condition, Colorado.

SEISMIC HAZARD ANALYSIS

Dr. Scawthorn has significant experience in the analysis of expected ground motions and seismic hazard for offshore platforms and critical structures. He has developed innovative methods in hazard analysis, including the first application of extreme-value statistics for the development of uniform-hazard spectra. Relevant experience includes the following:

- Hazard analysis and development of response spectra, platform Gail, and numerous exploration sites, Santa Barbara Channel, California. Prepared for Chevron.
- Hazard analysis, generation of spectra and analysis of site-specific effects, platform Troll and other sites, North Sea. Prepared for Norsk Hydro.
- Review of seismic hazard analyses by others, Brage Platform, North Sea. Prepared for Statoil.
- Hazard analysis, generation of spectra, and analysis of site-specific effects, various locations, including:
  - Colony Shale Oil Project, Colorado. for Exxon, Research & Development.
  - Wolf Creek Nuclear Power Plant (SNUPPS), Kansas.
  - Taipei World Trade Center, Taiwan. Prepared for T. Y. Lin International.
  - San Juan, Puerto Rico (DP Center)
  - Sixth Fleet (U. S. Navy) proposed communications center, Italy.
  - United Kingdom, Japan, Pacific Northwest, etc.
- Analysis of probability of a major earthquake in the Tokyo, Japan area, for a fixed time period, for Goldman Sachs.
- Quality assurance reviews, including seismic hazard analyses, for nuclear power plants and nuclear waste repositories in the United States and the United Kingdom. Notable projects include the seismic hazard analysis for the Wolf Creek Nuclear Power Plant in Kansas and the estimation of long-term geologic and seismic effects on low-level nuclear waste repository integrity in the United Kingdom.

TESTING

- **Field Test to Destruction of a full-size EHV steel electric transmission pole** - the purpose of the test was to determine ultimate strength and stiffness characteristics of a new design. The 100+ foot tall double circuit 8 ft. diameter steel pole was fabricated of multiple thicknesses of steel plate, and the test identified problems in the design having to do with local buckling, leading to a modified design.
- **Shake Table Test to Destruction of a low-strength masonry building** – the test purpose was to determine failure modes and effects of mitigation measures for low-strength masonry, primarily in lesser industrialized countries. Adobe blocks were fabricated and the near full-size test building was constructed and instrumented on the Richmond shake table of the Univ. of California at Berkeley. Mitigation measures (ring beam, and various wall reinforcements) were incrementally employed, to determine their relative contribution to overall lateral load capacity. This was the first such test of a near full-size low-strength masonry building.
- **Shake Table Test to investigate sloshing of an sloping wall water reservoir**. Sloshing behavior of liquids under seismic ground motions is generally well understood for vertically walled rectangular and circular tanks, but no solutions exist for sloping wall containers. A common design of roofed in ground water reservoirs features sloping walls, so that sloshing behavior is a major concern. Shaking table tests were performed on two scale models at the University of Southern California, to validate numerical modeling.

RISK AND DECISION ANALYSIS

- Analysis of Security Vulnerability, for several water agencies.
- Analysis of potential losses to multi-billion dollar real estate and/or insurance portfolios in the United States and abroad, for a number of large financial and institutional clients, for earthquakes, hurricanes and other natural hazards. Clients have included Allstate, Munich Re, Firemans Fund, Cigna Worldwide, Royal, various Lloyd's Sydicates, London Insurance and Reinsurance Market Association, Moody's, Ambac, AIG, Tokio Marine, Yasuda, Koa, Mitsui Marine, Nationwide, Allianz, Insurance Corporation of British Colombia, National Committee on Property Insurance, Natural Disaster Coalition, Prudential, Hartford Steam Boiler, Allendale, California State Automobile Association and others. This work over a number of years has required development of a number of innovations, including analysis of reinsurance losses, development of methods for portfolio management based on optimization techniques, probability of ruin analysis, analysis of mortgage-backed securities, automobile losses and related issues.
- Development of a risk analysis framework and management of a team of process, mechanical, and structural engineers to determine risks and an optimal repair program for a liquefied natural gas plant, due to risks from fire and business interruption caused by collapsing soils on Das Island in the United Arab Emirates.
- Development of design criteria for airport runway expansion, Unalaska, Alaska. Project involved determination of renovated runway elevation based on benefit cost analysis, including consideration of constructability, risk of aircraft accidents (esp. given generally poor weather conditions) in addition to usual factors.
- Analysis of Bank of America data processing facilities in San Francisco and Walnut Creek for potential earthquake impacts, in support of corporate planning for operational reliability.
- Analysis of stress events in support of capital improvement program design, Contra Costa Water District, California. Stress events included earthquake, windstorm, wildland/ urban/ industrial fires, transportation accidents and hazardous materials incidents. Benefit-cost analyses were employed for determination of optimal allocation of capital for a five year capital improvement program.
- Analysis of Seismic Impacts and Disruption of Lifelines, National Lifelines Systems, for Federal Emergency Management Agency. Lifelines included state and federal highways, major bridges, ICC-regulated railroads, EHV electric transmission, oil and gas pipelines, broadcast facilities, airports and ports and harbors. Benefit-cost analyses were employed to determine an optimal level for retrofitting, in support of Federal policy.
- Economic analysis of the impacts of the Northridge earthquake, on the California economy, for the Governor's Office of Emergency Services. The analysis involved estimation of damage, and input of this damage to an Input-Output model to determine quarterly economic impacts by sector of the Californai economy. The analysis accounted for federal aid and insurance payments.

PLANNING

- Principal in charge of the technical team to develop a national flood loss estimation model, algorithms, data and software, to be incorporated in HAZUS, for the National Institute of Building Sciences, and the Federal Emergency Management Agency.
- Development and Implementation of Exercises of the Plan to Coordinate Post-earthquake Investigations, for ATC and the USGS
- Development of a Plan to Coordinate Post-earthquake Investigations, for ATC and the USGS (member of Committee and an author)
- CAPSS – Community Action Plan for Seismic Safety – Analysis of building earthquake damage for the entire City of San Francisco, as a basis for development of a long-term seismic risk reduction plan, for the Dept. of Building Inspection, San Francisco.
- Development of Earthquake Risk Management – A Toolkit for Decision-makers, for the California Seismic Safety Commission – consisted of three publications for dissemination to Mayors, City Managers and Agency Heads, and a dissemination plan.
- Analysis of flood losses and development of a national flood insurance scheme, for an eastern European nation, for the World Bank
- Analysis of national natural hazards risk vis-a-vis FONDEN, for the Ministry of Finance, Mexico
- Review of Benefit-Cost analyses for flood mitigation alternatives, for the Cities of Grand Forks ND and East Grand Forks, MN. .
- Analysis of the impacts of a major Pacific Northwest earthquake on fire stations and related emergency response facilities in the Puget Sound area, for the U.S. Geological Survey.
- Analysis of Seismic Impacts and Disruption of Lifelines, National Lifelines Systems, for Federal Emergency Management Agency.
- Identification and development of multi-attribute approaches for the mitigation of seismic hazards in buildings in compliance with California Senate Bill 547, for the cities of Hayward, San Leandro, and Walnut Creek.
- Economic analysis of the impacts of the Northridge earthquake, on the California economy, for the Governor's Office of Emergency Services. The analysis involved estimation of damage, and input of this damage to an Input-Output model to determine quarterly economic impacts by sector of the Californai economy. The analysis accounted for federal aid and insurance payments.

RESEARCH

- Development of MIRISK (*Mitigation Information and Risk Identification System*), a web-based package for natural hazards information and mitigation worldwide, developed under World Bank funding.
- Estimation of potential property losses in Los Angeles from a magnitude 8.3 earthquake on the southern San Andreas Fault. Assessed implications of study results for future earthquake research planning scenarios for the U.S. Geological Survey.
- Development of a probabilistic model of post-earthquake related ignitions, fire development and suppression capability. This model's development has been unique in the US, and has become the industry standard for analysis of fire following earthquake, being employed by water and fire departments, and the insurance industry. Research supported by the National Science Foundation, the US Geological Survey and the insurance industry.
- Analysis of the economics of an urban region, with consideration of the dis-amenity of seismic damage. A differential equation approach was taken to analyze an idealized urban region, accounting for costs of capital, transportation and earthquake damage. This was subsequently extended to a linear programming model for a discretized urban area (San Francisco), finding that relatively small changes in land use patterns could realize significant savings in earthquake damage (order of 25%) and total urban operating costs (order of 2%).
- Analysis of insurance loss statistics, Whittier, Loma Prieta and Northridge earthquakes, for the National Science Foundation.
- Analysis of lifeline impacts due to Hurricanes Andrew and Iniki, for the National Science Foundation.
- Analysis of the impacts of earthquakes and effects of disruption on the national lifeline network, for the Federal Emergency Management Agency.
- Analysis of potential earthquake damage, New York City, for the National Center for Earthquake Engineering Research.
- Development of simplified reliability-based analytical techniques for critical system equipment, for the National Center for Earthquake Engineering Research.
- Development of EQEHAZARD™ family of software, for California, Canada, Japan, New Zealand, Chile, Israel, Italy and Iceland. This software was developed as a production tool for the analysis of individual site earthquake hazard, and portfolio losses. The portfolio loss analysis accounted for site soil conditions, deductibles, probabilistic aspects and reinsurance layers, for portfolios of hundreds of thousands of sites. The software employed a graphical user interface, and provided summary and detailed graphical and numerically tabulated output. Subsequent development included extension to wind hazards in the UK (UKWind), and in the US (USWIND).
- Development of LLEQE™, a software tool for the analysis of earthquake effects on lifelines. The software is capable of analyzing networks numbering in the thousands of nodes and links, and determined damage, system connectivity, residual capacity using simplified techniques, and economic impacts, using Input-Output modeling. LLEQE™ was employed for a major project for the Federal Emergency Management Agency, involving the analysis of the conterminous US highway, railway, electric, gas, oil and water and air transportation networks.

Charles Scawthorn

Statement of Professional Contributions

I have had a long professional career beginning in 1968 and working professionally on many projects as well as teaching and conducting research in academia. While I list these activities, I leave it to others to decide which may be contributions.

1968-1976 Early career

My undergraduate education was in structural engineering at the Cooper Union for the Advancement of Science and Art (New York), with probably my first professional contribution being my undergraduate senior thesis, the design of an orthotropic steel highway bridge, in collaboration with Charles Hofmayer, a fellow student at The Cooper Union. Our design won first prize in the student category of the 1966 international contest sponsored by US Steel, with a cash prize of $5000.

Following my undergraduate studies, I received a Master of Science degree in Civil Engineering from Lehigh University (Pennsylvania). My Master's thesis publication in the journal *Soils and Foundations*, on Limit Analysis and Soil Mechanics.

My first job was with the Consolidated Edison Company of New York, where I designed a number of structures especially EHV electric transmission towers and poles, and then continued with several consulting and design firms, designing a variety of structures including offshore towers, buildings and nuclear facilities. Notable projects included:

- **PJM EHV Transmission line:** I designed the foundations and tested superstructures of this 345 kV EHV transmission line, which serves as the backbone electrical grid of the northeast United States. These structures are now more than 50 years old and have stood the test of time.
- **Barnwell Nuclear Fuel Reprocessing Facility:** I designed portions of this facility including hot cells and buried tanks, in accordance with NRC requirements.
- **Offshore Oil Platforms:** I analyzed and/or designed or estimated seismic hazard for a number of offshore oil production and exploration platforms, offshore California, in the North Sea and offshore Australia.

197601981 Doctoral studies at Kyoto University

At this point, I became interested in the question of seismic risk and its effect on urban form. Receiving a scholarship from the Japan Ministry of Education in 1976 I first studied the Japanese language at Osaka University of Foreign Studies for six months and then entered the doctoral program of Kyoto University to pursue this question of urban form, my main advisor being Prof. Yoshikazu Yamada, but receiving much from Profs. K. Toki (DPRI), H. Iemura, H. Kameda and Amano.

I defended my dissertation *Urban Seismic Risk – Analysis and Mitigation* and received my doctorate in 1981, with several chapters of my dissertation being published in academic journals, including models of structural fragility in *Earthquake Engineering & Structural Dynamics*, models of urban post-earthquake fire hazard in the journal *Disasters*, and a model the influence of natural hazards on urban housing location in the *Journal of Urban Economics*.

Career 1981-2003

In 1981 became an Associate in the firm of Dames & Moore, San Francisco, where I worked on problems of seismic hazard for offshore platforms and other structures in California and the North Sea, analyzed settlement risk at a major gasification plant in Abu Dhabi, analyzed and designed seismic retrofits for outtake towers at a major dam, and worked on risk analysis for airports, major data centers and a variety of other facilities and structures. I developed computer software for analysis of large portfolio natural hazards risk and provided these services to major international insurance and reinsurance companies. I also was funded by the National Science Foundation to perform research into two major issues I identified: (1) post-earthquake fire risk and water supply. This led me to work closely with the San Francisco Fire Department, assisting them with quantifying this risk to San Francisco and designing and having a $46 million bond approved by 91% of voters; (2) the earthquake risk to low-strength masonry buildings. This research included the construction and testing for the first time of a full-scale adobe building on the shake table at the University of California's Richmond Field Station facility. This testing identified failure modes and evaluated a variety of retrofit measures including ring beams and skin application of wire mesh. These results were included in the International Association of Earthquake Engineering's *Guidelines for Earthquake Resistant Non-Engineered Construction*, published by IAEE's Committee on Non-Engineered Construction, on which I served.

During this period, recognizing the pioneering work being done in Japan in preparation for the predicted Tokai earthquake, I organized a *Committee on the Anticipated Tokai Earthquake* within the US Earthquake Engineering Research Institute. From 1984 to 1995 this committee brought together Japanese and US researchers and practitioners, in meetings in Japan, Hawaii, at Stanford University and in 1995 in Osaka, fostering mutual understanding which enabled US-Japan collaboration in investigating the 1989 Loma Prieta, 1994 Northridge and 1995 Hanshin-Awaji earthquakes.

In 1987 I joined the firm of EQE International as Sr. Vice President for research and the insurance practice. We were one of the first natural hazards risk modeling firms, developing the EQEHazard family of software for earthquake and hurricane risk and having as clients virtually every large insurance and reinsurance company. I also continued in the practice of structural engineering, analyzing and designing seismic strengthening measures for many commercial and government buildings, such as over 50 San Francisco fire and related facilities and a similar number of Seattle municipal buildings. I also led major projects for the US Federal Emergency Management Agency, including an analysis of the effects of major earthquakes on the US national infrastructure systems, and conceiving of and developing the Rapid Visual Screening (RVS) methods for identification of seismically vulnerable buildings. I received the Distinguished Service Award from the Applied Technology Council for this work, and the RVS methodology has since been used to assess hundreds of thousands of buildings in the U.S. and adapted for use in Japan, Taiwan, Canada, Greece and other countries.

During this period, I also led or participated in surveys of effects on structures for a number of large natural disasters, including the 1985 Mexico City, 1988 Spitak (Armenia and 1989 Loma Prieta, 1994 Northridge and 1995 Hanshin-Awaji earthquakes, 1992 Hurricanes Iniki (Hawaii) and Andrew (Florida), 1989 First Interstate Bank Building fire (tallest high-rise in California) and 1991 East Bay Hills fire. For all these events I wrote or contributed to major reports by the Earthquake Engineering Research Institute or other publications.

Among these events, I was present for the 1989 Loma Prieta earthquake and immediately proceeded to the Marina fire, where I lent my structural engineering expertise to the fire department for search and rescue. I was also in Osaka at the time of the 1995 Hanshin-Awaji earthquake and flew over that event in the afternoon observing and recording fire department efforts to suppress the fires.

As a result of the 1995 Hanshin earthquake, I opened an office in Tokyo for EQE International and brought our seismic retrofit experience to Japan, at the invitation of Mitsubishi Shoji, Mitsui Bussan and Sumitomo Shoji. We soon engaged in the retrofit of many buildings in Japan, including the first seismic retrofit of a high-rise building in Japan (next to the Palace Hotel in Tokyo), and also assisted major Japanese insurance companies in understanding and managing their commercial earthquake risk. After two years in Tokyo, I returned to San Francisco and took charge of EQE's lifelines practice, helping major water utilities in California to seismically upgrade their systems. In addition to my many journal and conference publications, at this time I wrote major portions of, and edited contributions of others, for the 1,500 page *Earthquake Engineering Handbook*.

2003-2008 Professor, Kyoto University / DPRI activities

In 2003 I retired from EQE and accepted a professorship at Kyoto University, leading the Earthquake Disaster Prevention Laboratory (地震防災) in the Department of Urban Management, Faculty of Engineering. I had the honor of serving as professor until my mandatory retirement in 2008, during which time together with Assistant Prof. Y. Ono and Associate Professor J. Kiyono I supervised 19 undergraduate, 19 M.S., one doctoral candidate and one post-doctoral researcher. I retired from Kyoto University in 2008. In the period 2003-2008 I:

- Led an international project funded by the World Bank (a first for Kyoto University, I believe) which produced global databases, software and a website for identifying natural hazards risk anywhere in the world. This has been used by the World Bank in its decision-making for numerous projects, to assure the projects are properly designed for earthquakes, typhoons, tsunami and other hazards that could affect them. One aspect of this project that I was pleased about was that I brought two students (one undergraduate, one doctoral candidate) to the World Bank headquarters in Washington D.C. where they presented their work on the project to a large meeting of staff.
- Participated in a large Kyoto University reconnaissance team surveying the effects of the 2004 Indian Ocean earthquake and tsunami, including leading a portion of the team that traveled to Sri Lanka. I was responsible for the lifelines portion of the team, which produced a several hundred page report. This activity involved several DPRI researchers.
- Similarly, participated and/or led damage surveys of several earthquakes in Japan during the 2003-2008 period, including the 2004 Chūetsu (Niigata Prefecture) and 2007 Noto Peninsula events. For the 2004 Chūetsu I also led a US team, which produced a special issue for the event in the academic journal Earthquake Spectra. This activity involved several DPRI researchers.
- Created a cooperative research relationship with colleagues at Cambridge University (U.K.) with exchange of researchers and two workshops on human casualties in earthquakes, one each in Kyoto and Cambridge. These two workshops resulted in a book published by Springer. This activity involved several DPRI researchers.

- Similarly, had a cooperative research relationship with colleagues at Cornell University (U.S.) with exchange of researchers that resulted several publications.
- In 2008, recognizing that DPRI is one of the most outstanding leading research institutes for disaster research, but at that time had virtually no relationship with the global insurance industry, I organized the First International Conference on Asian Catastrophe Risk (1ICACI). This conference was attended by several hundred disaster researchers and insurance professionals from around the world, including persons from the World Bank and Asian Development Bank. The proceedings of this Conference was published by Risk Books, London. The conference began a series of interactions between DPRI and the global insurance industry that continues to this day.
- Similarly, recognizing that DPRI is perhaps the oldest and largest research institute for disaster research in the world, but that there are many other research institute for disaster research in the world, with little to no collective interaction or leadership, I conceived of the need for a global alliance of disaster research institutes, in which DPRI could play a leading role. Working closely with Prof. Hirokazu Tatano and his colleagues at DPRI, this concept (with DPRI and Monbusho support) grew into the Global Alliance of Disaster Research Institutes (GADRI), which now numbers over 200 disaster research institutes around the world. Since I retired from Kyoto University I am not a formal representative of a disaster research institute and am thus precluded from a formal role in GADRI, but I have participated in most of GADRI's meetings and activities and continue to support DPRI and GADRI in a number of ways.
- Another major collaborative effort I participated in with DPRI researchers (led by Prof. N. Okada) was a number of surveys of the effects of the 2011 Tohoku earthquake and tsunami. Due to the magnitude of this event and its effects, this activity persisted for several years.

While formally a professor in the Faculty of Engineering of Kyoto University, my collaboration and interaction with researchers and academics at DPRI has been characterized by fruitful and happy activities ranging from working with Professors Toki (a member of my doctoral committee) and Tadanobu Sato in the 1970s through to today, including Professors Cruz, Hayashi, Iai, Kaoru, Kawata, Maki, Mori, Nakajima, Nishino, Okada, Takata and Tatano.

2008-present

Following my retirement from Kyoto University, I have been honored to be Visiting Professor at Waseda University, Beijing Normal University and Stanford University. Since 2012 I have been a research associate of the Pacific Earthquake Engineering Research Institute of the University of California at Berkeley. During this time, I have also maintained an active research and professional practice, advising the World Bank and Asian Development Bank, and many national, state and local governments in the U.S. One project that was particularly rewarding was assisting the Government of Morocco on the development of a national natural hazards risk reduction strategy, over a ten-year period. Other recent and rewarding projects have included (1) conceiving of and helping develop the first natural hazards building taxonomy, for the Global Earthquake Model (GEM); (2) contributing to the U.S.G.S. SAFRR series of studies on earthquake tsunami effects in the western U.S.; (3) contributing to the major study *Mitigation Saves 2.0* for the Federal Emergency Management Agency, and (4) studying the effects of major stress events on buried pipe service life, for the Water Research Foundation. Some of my more significant activities have included:

Research

- **Fire following earthquake.** This work was initially part of my doctoral research at Kyoto University in the 1970s but has continued to this day. The initial model I developed, published in 1981, has been seminal in the development of larger and more complex models serving the insurance and emergency management communities, some of these models developed by myself. I edited a state-of-the-art book on this subject, published in 2005. Over the years I have collaborated with several DPRI researchers on this topic, most recently Prof. Nishino, with whom I co-authored a paper on the 100th anniversary of the 1923 Tokyo earthquake.
- **Probabilistic models of earthquake risk.** This work also grew out of my doctoral research and quickly became the first probabilistic model of earthquake risk, adopted by the global insurance and emergency management communities.
- **Strengthening of low-strength masonry buildings**. As part of this research thread I performed the first shaking table testing of a full-size low-strength masonry building, in 1985. This research examined the fragility of such buildings and the effectiveness of various methods of reinforcement including ring beams (at window and eave lines) and wall reinforcement of various types of wire mesh. This research subsequently contributed to the publication of the *Guidelines for earthquake resistant non-engineered construction by the* International Association for Earthquake Engineering in 1986.
- **Water supply for post-earthquake fires.** Recognizing the lack of communication between water and fire agencies, this work funded by the California Seismic Safety Commission examined the strengths and weaknesses of inter-agency communication, the capabilities of each agency community to provide adequate post-earthquake firefighting water supply, and methods for improving this situation.
- **Seismic Vulnerability and Impact of Disruption of Lifelines in the Conterminous United States:** This work funded by the U.S. Federal Emergency Management Agency quantified the impacts of major earthquakes on the national infrastructure, and formed the basis for a long-term mitigation plan by the national government.
- **Rapid Visual Screening of Buildings for Potential Seismic Hazards – A Handbook:** This work developed a methodology for rapid screening the seismic vulnerability of buildings. It has been applied to hundreds of thousands of buildings in the U.S. and adapted for use in Canada, Japan, Greece, Taiwan and other countries.
- **Effect of Major Stress Events on Buried Pipe Service Life**: This research examined the impacts of major stress events such as earthquake on the service life of buried water pipe, finding that such events significantly shortened service life.
- **HAZUS Flood Model**: This project developed a detailed flood loss assessment model for the conterminous United States, which has been used for over twenty years by planners and emergency managers.

Selected structural engineering projects

Here I list a few of my more significant structural design and analysis projects I have performed:

- **Arecibo Radio Observatory:** I led the seismic analysis of this 1000 ft. diameter radio observatory in Puerto Rico, identifying seismic deficiencies and developing seismic retrofit measures.

- **Das Island Gas Liquefaction Plant:** This existing plant is a major facility in the Persian Gulf which processes and liquefies natural gas to produce LNG for export. It is constructed on calcareous soils which led to differential settlement of many units, with the potential for product release and fire and explosion. I developed a risk assessment approach and evaluated all units in the facility for the purpose of an optimized repair and retrofit program.
- **San Francisco Water System:** For over 40 years I have consulted to the San Francisco Public Utilities Commission on the seismic reliability of its system, and assisted in the development of risk reduction measures.
- **San Francisco and Seattle Municipal Buildings:** On several projects I led seismic analyses of over 100 municipal buildings, primarily low-rise fire, police, library and similar buildings but also including several high-rises.
- **Goldman-Sachs**: In several projects I provided risk assessment services to this international large investment banking firm, including evaluating their New York, London, Tokyo and Hong Kong facilities for natural hazards and terrorism risk.

The above are just a sample of some of the engineering projects I have led or contributed to. See my CV for more detail.

Natural hazards field investigations

Lastly, I list here the various natural and other disaster events I have investigated during my career.

Earthquake	2024 Noto Peninsula (Japan)	1994 Northridge
	2014 Napa	1993 Hokkaido Nansei (Japan)
	2011 Tohoku (Japan)	1992 Landers
	2010 Haiti	1989 Loma Prieta
	2009 West Sumatra	1988 Armenia
	2008 Wenchuan	1988 Saguenay (Canada)
	2007 Niigata Chetsu Oki (Japan)	1987 Whittier
	2005 South Asian (Pakistan)	1986 Edgecumbe (NZ)
	2004 Indian Ocean Tsunami	1986 North Palm Springs
	2004 Niigata Chuetsu (Japan)	1985 Mexico
	2001 Nisqually (Seattle)	1984 Morgan Hill
	1999 Marmara and Duzce (Turkey)	1983 Coalinga
	1995 Hanshin (Kobe, Japan)	1978 Miyagiken-oki (Japan)
Wind	2007 Cyclone Sidr (Bangladesh)	1992 Hurricane Andrew
	2005 Hurricane Katrina	1992 Hurricane Iniki
Fire / Blast	2017 LNU Complex / Tubbs Fire	1990 Ruby Wildfire
	2010 San Bruno Gas Explosion	1989 First Interstate Bank Bldg
	1993 Southern California Wildfires	1984 Baldwin Hills (LA)
	1991 East Bay Hills	1982 Anaheim
Flood	2007 Cyclone Sidr (Bangladesh)	1997 Grand Forks
	2005 Hurricane Katrina	
Other	1992 Shasta Hazmat Spill	2010 Kyrgyzstan Civil Conflict

I have documented almost all of these investigations in various journal articles or reports.

Fifty years of 地震研究

or

How Japan helped me to make a small contribution to earthquake engineering

Charles Scawthorn. S.E., D.Eng.
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I am deeply honored to receive the DPRI Award. I have been affiliated with Kyoto University for 50 years, so that this Award has a very special meaning for me. To explain this, I'd like to begin by how I came to Kyoto University and more generally Japan and how this began my journey as an earthquake engineer. After that, I shall discuss some of the places that journey took me to, both geographical and intellectual.

In 1976, I was already a practicing structural engineer in San Francisco designing towers, buildings, offshore platforms and large industrial facilities, including for earthquakes, when I became interested in cities and why they are shaped the way they are. I realized that downtown San Francisco, with all its high-rise buildings, was on the softest soil, was "mal-optimized" when one considered earthquake damage. The thought occurred to me "how far would I have to move the central business district (CBD) to achieve an optimum city form?" And then I thought, *that would make an interesting doctoral research topic!* I would learn about earthquakes and could work to reduce earthquake damage around the world.

I considered the best place to pursue that research – it would have to be a place with large densely populated cities, high seismicity, a top university, and a rich culture since, if I was returning to university for several years I also wished to learn another culture and language. Well, only one place satisfied all these constraints – Japan. My choice was Tokyo or Kyoto, and that was an easy choice.

I arrived in Kyoto in October 1976 and joined the laboratory of Prof. Yamada Yoshikazu, where I worked on seismic hazards, structural response, agents of damage such as shaking, liquefaction and fire following earthquake, and the economics of these factors, until March of 1981 when I received my doctorate. In those years I benefited from the teaching and assistance of Profs. Yamada, Iemura Hirokazu, Kameda Hiroyuki and Toki Kenzo, and many others. I also met my wife, Nini Jensen, from Denmark, a scholar of early Showa history. I had a wonderful time, drinking in Japanese society, sometimes in Gion with Prof. Yamada.

In 1981 I returned to San Francisco with Nini and joined the firm of Dames & Moore where for the next 6 years I performed seismic hazard and risk studies, developed a probabilistic fire following earthquake model that is now used by the insurance industry worldwide, and researched methods of reinforcing low-strength masonry buildings, which are the source of most earthquake deaths in lesser developed economies. During that time I maintained close ties with Kyoto University and the Japanese earthquake engineering community, participating in US-Japan workshops and meetings and founding the US-Japan Committee on the Anticipated Tokai Earthquake of the US Earthquake Engineering Research Institute (EERI). The Tokai earthquake had been predicted to occur with very high probability and great damage in the area around the Izu Peninsula near Tokyo, so that Japan was heavily investing in reinforcing schools and other buildings and building tsunami defenses and other safety measures. There was much the US could learn from this, hence the committee, which I led and organized several large successful workshops in Japan and the US, introducing many US earthquake engineers to their Japanese counterparts.

In 1987 I joined the firm of EQE International where we focused on earthquake engineering (the "EQ" and "E") because Silicon Valley, sited between the San Andreas and Hayward faults, had factories, people and enormous values in assets in large fragile older buildings that would collapse in an earthquake. We reinforced literally thousands of buildings and grew the firm from a modest consulting firm focused on Silicon Valley to a firm of 600 people in 30 offices in 10 countries, along the way creating the practice and market of earthquake risk management. Some of the projects I had at that time included analyzing and developing structural retrofits for all of San Francisco's fire stations and all of Seattle's municipal buildings. I founded EQE's practice helping insurance companies understand their earthquake risk and then all natural hazards risk, with Lloyds of London and virtually all the major insurance companies worldwide becoming our clients. In doing this we pioneered many of the probabilistic practices that have now grown into a billion dollar a year "risk modeling" industry.

In 1995 I was in Osaka attending a US-Japan meeting of EERI when the Hanshin Awaji earthquake occurred. I flew over Kobe that afternoon, observing the thousands of collapsed buildings, large fires and firefighters desperately trying to draft water from flood channels because the water pipes had broken. The next day I survey damage on the ground from Nishinomiya to Rokko Island to Ashiya until late that night I walked to Osaka, passing thousands of people sleeping outdoors or

huddled around fires in the cold winter night. This only confirmed the choice I'd made two decades earlier to try to reduce earthquake damage.

Shortly thereafter, EQE was approached by a consortium of the three largest trading companies in Japan – Mitsubishi Shoji, Mitsui Bussan and Sumitomo Shoji to work with them to introduce earthquake risk management in Japan. These companies were usually fierce competitors but realized the methods EQE had developed in the US were needed in Japan. I opened and led EQE's Tokyo office for the next two years, by which time we'd built a staff, performed many seismic retrofits including the first of a high-rise building in Japan, and introduced probabilistic practices to Japan's largest insurers.

In 2003 Prof. Toki retired and Kyoto University performed a global search to fill his chair. I applied and was accepted, having the honor to be a Kyoto University Professor, heading the Earthquake Disaster Prevention Laboratory assisted by Associate Professor Kiyono Junji and Assistant Professor Ono Yusuke. For five years, until I reached the mandatory retirement age, I taught supervised and engaged in research and helped advance earthquake disaster prevention, particularly regarding lifelines and infrastructure. One project we worked on was for the World Bank, in which two students developed a global database that allowed World Bank employees to assess earthquake, flood, volcanic and typhoon risk for any Bank project worldwide. I was particularly pleased when the two students demonstrated the software at the World Bank Headquarters in Washington DC, and showed how the billions the Bank was investing could be designed so as to greatly reduce future losses.

As I approached retirement from Kyoto University, I thought *what can I leave that will reduce natural hazards losses and benefit Kyoto University*? I realized that KyoDai's Disaster Prevention Research Institute (DPRI) is probably the largest and oldest disaster research institute (DRI) in the world and that, while each professor at DPRI has international contacts, many DRIs around the world had little official contact with DPRI. The concept of a Global Alliance of Disaster Research Institutes (GADRI) occurred to me, in which many DRIs could speak with one voice, share data and come together on research topics and policies. This was a mere seed of an idea which I discussed with people at DPRI particularly Prof. Tatano Hirokazu, who with many others has grown this concept into an alliance of over 200 DRIs worldwide.

Since 2008 I've served as a Visiting Professor at Waseda University, Beijing Normal University and Stanford University, and been affiliated with the University of California at Berkeley, working to improve our understanding of how to reduce

earthquake, fire and other natural hazards losses. I've also served as an Advisor to the Global Facility for Disaster Reduction and Recovery of the World Bank, working on projects in many countries, such as a ten year project to develop a national strategy for natural hazards risk reduction in Morocco, and the development of a national fire building code in Bhutan.

In all this, I have applied, and in a small way advanced, the methods of probabilistic risk quantification and reduction that I learned at Kyoto University. In doing this, I've had the joy of living in Japan for almost twenty years of my life, which has been most gratifying. All cultures are unique, but Japan's culture stands out for the way it blends centuries-old tradition with cutting-edge modern life—where quiet shrines sit beside neon skylines, where craftsmanship is treated as a lifelong discipline, and where everyday gestures, from bowing in greeting to carefully wrapping a gift, reflect a deep respect for harmony, beauty, and other people. This I also learned in Kyoto.

Charles Scawthorn

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Awarded on March 18, 2026