

SUMMARY

Transdisciplinary thought leader, communicator, and coalition architect on the use of socio-environmental data and information to inform national policies at the nexus of climate, ecosystems, and society. Expert navigator of the interstitial space between science, technology, organizational goals, and socio-political drivers. Strategized and executed initiatives to engage the US Congress, White House, federal agencies, public policy professionals, academic institutions, and private sector partners.

PROFESSIONAL EXPERIENCE

Massive Connections, LLC. Founder and Managing Director. Apr 2016 – Present.

- Principal Investigator for a funded study leveraging open data and information to accelerate the innovation of coastal and agricultural resilience solutions as part of an experimental concept called the “Resilience Genome Initiative” (ongoing).
- Manage scientific proposal review panels on (1) machine learning for environmental applications, (2) sustainable infrastructure for climate-stressed environments on behalf of the American Association for the Advancement of Science (ongoing).
- Signatory on a letter to Congress advocating for the OPEN Government Data Act signed into law in January 2019.
- Consulting as the Senior Advisor for Data, Science, and Policy for an environmental risk assessment consultancy (ongoing). Duties and accomplishments include:
 - Business development focused on EPA, NOAA, and USAID on incorporating observation and model data into formal decision-analysis (Structured Decision Making) for policymaking and strategic planning in the areas of environmental sustainability (environment, economy, society) and climate resilient infrastructure.
 - Authored analyses and presentations on how data-driven environmental risk-assessment fits within the context of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA: the “Superfund” statute for environmental cleanups) that were shared with Congress’ Government Accountability Office, the US House Committee on Space, Science, and Technology, and the Environmental Protection Agency.

National Ecological Observatory Network (NEON) Inc. Chief of Strategic Alliances. May 2014 – Apr 2016. *Duties:*

- Foment cross-sectoral constituencies around the use of socio-environmental data and information for science, education, and decision-making on sustainability challenges at the nexus of climate, ecosystems, and society.
- Develop written materials and conduct in-person briefings to US legislative bodies and US executive branch agencies on science, technology, and policy matters.
- Identify and assess collaboration technologies for enabling data-intensive ecological science and identify opportunities for the NEON community to use those technologies.

Accomplishments:

- Led discussions with the US Department of State on an ASEAN (Association of Southeast Asian Nations) workshop to apply science and technology for climate resilience under the US – Singapore Third Country Training Program. Served as an invited faculty member on a Lower Mekong Initiative workshop (Hanoi, Vietnam) on using data and models to address socio-environmental challenges arising from dam building, changing economics, and climate change.
- Invited to a working group of the World Bank's Global Facility for Disaster Reduction and Recovery.
- Drafted MOUs with US and international entities. Conducted briefings for the embassies of Britain, France, Australia, Republic of Korea, Norway, Czech Republic, and Sweden.
- US science, technology, policy representative to a European Union funded project for initiating coordination activities among biodiversity and ecosystem research e-infrastructures.
- Initiated Esri-NEON partnership. Esri is company behind ArcGIS. Conceptualized and led development of a prototype Tribal Lands Collaboratory with partners including the Tulalip Tribes, American Indian Higher Education Consortium, and USA National Phenology Network.
- Contributed language to a citizen-science and crowdsourcing bill signed into law by President Obama (American Innovation and Competitiveness Act, Public Law 114-329 § 402).
- Prepared witnesses and written testimonies for hearings before the US House Committee on Science, Space, and Technology.
- Primary author of response to the request for public comment on the triennial update to the US Global Change Research Program's Strategic Plan (2016).

National Ecological Observatory Network (NEON) Inc. Chief of External Affairs. May 2008 – May 2014. *Duties:*

- Develop written materials and conduct in-person briefings to US legislative bodies and US executive branch agencies on science, technology, and policy matters.
- Conceptualize how NEON can be leveraged by the US government, academic partners, and private sector partners for science, education, and resource management.
- Assess and synthesize science and technology priorities established by the national science leadership and identify opportunities for the NEON community to contribute to those priorities.

Accomplishments:

- Prepared written and/or oral testimonies submitted before the US House and Senate Appropriations Subcommittee on Commerce, Justice, Science, and Related Agencies.
- Co-founded the annual Climate Science Day on Capitol Hill where climate scientists are introduced to Congressional offices.
- Conducted extensive informational briefings on NEON to the Congressional Research Service, Congressional caucuses, US House of Representative offices, and US Senate offices.
- Liaised with the White House Office of Science and Technology Policy (OSTP) and numerous federal agencies (including Department of Agriculture (various bureaus), US Department of the Interior (primarily US Geological Survey), Smithsonian Institution, NASA, NOAA, Environmental Protection Agency, US Department of State, Department of Energy).
- Recruited as a member of an OSTP Task Force on the National Earth Observation Portfolio Assessment. Liaised with the OSTP co-directed US Global Change Research Program secretariat.
- Invited to present before President Obama's Council of Advisors for Science and Technology on NEON as an integrated component of the US federal asset for environmental observations.

American Institute of Biological Sciences. NEON Administrative Director. Sep 2006 – May 2008.

Duties:

- Supervise the creation of the business office for the newly incorporated NEON Inc.
- Formalize the governance policies and procedures for the nascent NEON Inc Board of Directors.

Accomplishments:

- Successfully led NEON through an existential threat after a major project restructure.
- Led, organized, and wrote NSF proposals for AIBS and NEON Inc in the total amount of more than \$27M. Administered programmatic expenditures of approximately \$7M.
- Led the initial design of NEON's physical- and cyber-infrastructure including:
 - Analyzing and integrating the community's scientific needs.
 - Translating scientific needs into infrastructure requirements.
 - Translating requirements into (a) capital construction cost estimates and (b) annual maintenance and operations costs.

American Institute of Biological Sciences. NEON Staff Scientist. Sep 2005 – Sep 2006. Duties:

- Managed the identification and recruitment of scientific teams to gather requirements for the proposed scientific infrastructure.

Accomplishments:

- Synthesized external scientific input for the NEON Integrated Science and Education Plan.

American Institute of Biological Sciences. NEON Post-doctoral Associate. Dec 2004 – Sep 2005.

Duties:

- Performed research on existing scientific infrastructure and programs.

Accomplishments:

- Participated in the creation of the NEON, Inc. corporate bylaws and articles of incorporation.
- Synthesized input from the scientific community on their expectations of the NEON scientific infrastructure.

Andersen Consulting (now Accenture). Senior Consultant. Jun 1995 – Sep 1998. Singapore. *Duties:*

- Team leader on a project to design and implement an electronic procurement system for the Singapore Ministry of Defence (MINDEF). Charged with strategizing and marketing computer-based training (CBT) contracts to MINDEF.
- Team leader for the human-computer interface component of Singapore's e-government website (<http://www.ecitizen.gov.sg>) for citizens to obtain information on government services and perform transactions electronically.
- Team leader on a project to design and implement a website for graduating secondary school students to bid for placement in junior colleges for the Singapore Ministry of Education.

Accomplishments:

- Pioneered the successful use of concept mapping techniques for the design, delivery, and capture of concepts for a highly acclaimed workshop on interaction-design principles at Andersen Consulting's centralized worldwide training facility.
- Received awards for Outstanding Team Performance (1996, 1997).

Andersen Consulting. Consultant. Jun 1992 – Sep 1993. Singapore. *Duties:*

- Team member in the research, data collection and analysis phases of an IT project for a financial securities firm.
- Team member in the design and development of an enterprise information management system for a gold and copper mining firm.
- Team member on a systems integration project for a major gold and copper mining firm and for a Belgian Export and Import Bank.

Accomplishments:

- Awarded a full corporate scholarship for my M.Sc. at Northwestern University (1993 – 1995) while remaining under the employ of Andersen Consulting.
- Received award for Outstanding Individual Achievement (1993).

EDUCATION

- 1998 – 2004: Ph.D. (Evolution, Ecology, and Behavior), University of Texas at Austin
- 1993 – 1995: M.Sc. (Computer Science – Artificial Intelligence), Northwestern University
(Under a corporate scholarship from Andersen Consulting)
- 1989 – 1992: B.Sc. (Information Systems and Computer Science), National University of Singapore
(Under a corporate scholarship from Neptune Orient Lines, Singapore)

SKILL PROFILE

Core Competencies

Science: Global environmental change, socio-ecological sciences, earth sciences, evolution, climate adaptation.

Technology: Computer science, informatics, big data, open data, interoperability, e-infrastructure, in-situ sensing, remote sensing, citizen science, crowdsourcing.

Policy: US science and education, ecosystem services, biodiversity, open data, earth observations.

Science, Technology, and Policy Constituencies

US Government

NGOs and Professional Scientific Societies

Academia (US and International)

Private Sector (US, primarily technology companies)

US Government Interactions

Congress: Strategized and executed engagement with the US Congress (including the Government Accountability Office, Congress' investigative arm), including: (1) Strategized approach, prepared witnesses, and drafted testimonies for appearances before Congress; (2) Conducted informational briefings; (3) Provided feedback on draft legislation; (4) Organized and led constituency visits to Congressional offices.

White House Office of Science and Technology Policy (OSTP): Provided formal input to various White House directed programs and initiatives, including: (1) President's Council of Advisors on Science and Technology; (2) US Group on Earth Observations; (3) US Global Change Research Program; (4) Open data initiatives.

Federal agencies: Scientific liaison to executive leadership at US federal agencies, including: (1) Department of Agriculture (various bureaus), (2) US Department of the Interior (primarily US Geological Survey), (3) Smithsonian Institution, (4) NASA, (5) NOAA, (6) Environmental Protection Agency, (7) US Department of State, (8) Department of Energy.

Languages

Languages: English (Native), Chinese Mandarin (Intermediate), Chinese Cantonese (conversational), Chinese Fujian (conversational).

SELECTED U.S. LEGISLATIVE BRANCH (CONGRESS) ACTIVITIES

Testimonies	Prepared written and/or oral testimonies submitted before: <ul style="list-style-type: none">• US House and Senate Appropriations Subcommittee on Commerce, Justice, Science, and Related Agencies.• US House Appropriations Subcommittee on Energy and Water Development, and Related Agencies.• US House Committee on Science, Space, and Technology.
Briefings	Conducted extensive informational briefings on NEON to the Congressional Research Service, Congressional caucuses, US House of Representative offices, and US Senate offices. Co-organized annual Climate Science Day on Capitol Hill for 2011, 2012, 2013, and 2014. Led teams on visits to Members of Congress. Lead teams on visits to Members of Congress for the Biological and Ecological Sciences Coalition (BESC) Congressional Visits Day.
Others	Represented NEON, Inc. in the science-policy groups Coalition for National Science Funding and the Climate Science Working Group. Responded to requests by Congressional staffers to comment on draft legislation. Contributed to legislation signed into law (PL 114-329).

SELECTED U.S. EXECUTIVE BRANCH (FEDERAL AGENCIES) ACTIVITIES

US Global Change Research Program (USGCRP) related	Primary author of response to the request for public comment on the triennial update to the USGCRP Strategic Plan (2016). Member of the Steering Committee of the USGCRP – Wilson Center co-organized workshop “Tracking a Changing Climate: Citizen Science Contributions to the National Climate Assessment” (2014). Representative to the USGCRP’s National Climate Assessment (NCA) NCAnet since its inception; Lead point-of-contact to the USGCRP.
White House Office of Science and Technology Policy (OSTP) related	Primary author of response to the OSTP RFI for the National Big Data R&D Initiative (2014). Primary author of responses to the OSTP RFI for the National Plan for Civil Earth Observations (2013, 2016). Member of the 2012 OSTP Task Force on the National Earth Observation Portfolio Assessment.
Others	Invited to brief President Obama’s Council of Advisors for Science and Technology (PCAST) and the National Science and Technology Council’s (NSTC) Interagency Working Group on Scientific Collections. Primary architect behind NEON – US Dept. of Ag. (USDA) Long Term Agro-ecosystem Research (LTAR) network interoperability discussions. Lead point-of-contact on interagency data interoperability matters, and on MOU related issues with the EPA, USGS, and NOAA.

DATA, INFORMATICS, AND E-INFRASTRUCTURE CONTRIBUTIONS

E-infrastructure

US science, technology, policy representative to the EU funded:

- GLOBIS-B project to advance the implementation and calculation of the GEO BON Essential Biodiversity Variables.
- CReaTIVE-B project for initiating coordination activities among biodiversity and ecosystem research e-infrastructures .

Liaised with US NSF funded iDigBio for integrated digitized biocollections.

Member of the 17-member US Delegation to the Belmont Forum e-Infrastructure and Data Management Collaborative Research Action (2014 – 2015). The Belmont Forum comprises the world’s leading funders of global environmental change research.

Informatics Community Engagement

Board Member on the Foundation for Earth Science (2013 – 2017). The Foundation is the legal entity that organizes the Federation of Earth Science Information Partners, an open networked community that brings together science and data professionals.

Advisory Committee member for the NSF funded Brown Dog Project at the University of Illinois at Urbana Champaign’s National Center for Supercomputing Applications (2014 – 2017).

Active contributor to community forums and initiatives including: (1) US National Academy of Sciences’ Board on Research Data and Information; (2) Federation of Earth Science Information Partners, (3) US NSF funded e-infrastructure projects: EarthCube, DataONE, CyVerse.

FOSTERING INTERNATIONAL PARTNERSHIPS

Governments and Institutions

Provided briefings and updates to the embassies of Britain, France, Australia, Republic of Korea, Norway, Czech Republic, and Sweden.

Hosted delegation from the Republic of Korea (South Korea) on fact-finding mission for environmental observations.

Drafted Memoranda of Understanding (MOU) between NEON and the EU Integrated Carbon Observation System, the Australian Terrestrial Ecosystem Research Network, and the Global Change Research Institute of the Czech Academy of Sciences.

Academia

Co Principal-Investigator for National Science Foundation project titled “Building an international cooperative framework between the EU and the USA to harmonize data products relevant to global research infrastructures in the environmental field”.

Co Principal-Investigator for National Science Foundation project titled “Building Global Ecological *Understanding*”.

Restructured bylaws and helped institute governance body for the International Network of Next Generation Ecologists (INNGE).

SELECTED INVITED PRESENTATIONS

Climate, Biodiversity,
Ecosystems, Society

2015-09. USA. Tulalip Tribes: "Tribal Lands Collaboratory: Using data to inform options".

2014-09. France. ExpeER Ecosystem Research International Conference: "The Challenge of Research Infrastructure in a Changing World: Scientific infrastructure for addressing societal challenges".

2014-10. USA. Int'l Symposium on Weather and Climate Extremes, Food Security and Biodiversity, George Mason University: "Observation Systems for Understanding Large-Scale Interactions between Climate, Land-use Change, and other Large-scale Forcings on Biodiversity".

2014-08. Vietnam. Lower Mekong Initiative Cyberinfrastructure and Water Resources Workshop: "Science, Technology, and Policy Rising to the Challenge of Food Security".

National
Environmental
Observation Strategy
for Societal Benefit

2014-06. USA. White House Office of Science and Technology Policy's US Group on Earth Observations (US GEO): "US Civil Environmental Observations: NEON in the context of US federal observation assets".

2014-06. USA. Amer. Assoc. for the Adv. of Science's lecture series: "Complex (and Big) Environmental Data: Transforming Data into Information for Societal Benefit".

2013-10. South Korea. International Long Term Ecological Research Network Meeting (ILTER): "Environmental Observatory Interoperability for Societal Benefit".

2013-09. USA. President Obama's Council of Advisors on Science and Technology (PCAST): "The US National Ecological Observatory Network (NEON): Enabling continental-scale ecological science and education, informing society".

Informatics, Data and
E-infrastructure

2015-03. USA. Global Earth Observation System of Systems (GEOSS) Science and Technology Stakeholder Workshop: "From OpenData to OpenKnowledge: Generating Open Knowledge from Information and Data".

2014-05. Belgium. Association of European-level Research Infrastructure Facilities: "Big, Complex Environmental and Biodiversity Data".

2013-11. Taiwan. International Conference on Open Data in Biodiversity and Ecological Research at Taiwan Academia Sinica: "The US National Ecological Observatory Network (NEON): Enabling continental-scale ecological science and education, informing society".

2013-09. Spain. European Grid Infrastructure Conference: "The US National Ecological Observatory Network (NEON) and e-Infrastructures".

2013-06. Germany. Joint COOPEUS, ENVRI, and EUDAT Workshop on Persistent Identifiers for Open Time Series Data: "NEON within the context of US Environmental Observation Systems".

SELECTED COMMUNICATIONS PRODUCTS

Data and information
for socio-
environmental
decision-making

Report. 2019. *"D2dprov: Vision 2025: A transdisciplinary science, technology, and policy synthesis on data-driven, science-informed resilience planning for 2025 and beyond."*

<https://doi.org/10.6084/m9.figshare.7591238.v2>

Publication. 2019. *"The Resilience Genome Initiative: A vision for adapting at the pace of socio-environmental change."* Wee, Brian; Piña, Aaron. American Geophysical Union. (IN-PRESS)

Blog entry. 2018. *"Transdisciplinary thinking essential to enable sustainable data-intensive agroecosystems."* Piña, Aaron; Wee, Brian. First-prize winning blog entry published on CGIAR Platform for Big Data in Agriculture. <https://goo.gl/VS6TQd>

Poster. 2017. *"Data-Driven Decision-Management: A Values-focused Approach to Enable Traceable Decision Analytics for Adaptive Climate Resilience."* Wee, Brian; Black, Paul; Billig, Pat; Black, Kelly; Duffy, Paul; Rupp, Scott; Stockton, Tom (2017). figshare.

<https://doi.org/10.6084/m9.figshare.4515722.v2>

Poster. 2016. *"Esri-NEON Tribal Lands Collaboratory: An ODE to Phenology."* Wee, Brian; Jones, Katie; Kuslikis, Al; Rosemartin, Alyssa; Hardison, Preston; Piña, Aaron (2016). figshare.

<https://doi.org/10.6084/m9.figshare.2060325.v2>

Poster. 2014. *"Leveraging Environmental Observation Infrastructure for the Benefit of Society."* Wee, Brian; W. Loescher, Henry; Walbridge, Mark. figshare. <https://doi.org/10.6084/m9.figshare.923570.v1>

White paper. Submitted as part of an invited presentation to President Obama's Council of Advisors on Science and Technology (PCAST). 2013. *"Transforming Data into Information for Societal Benefit: An Illustrated Overview of Interoperability Approaches."* Wee, Brian.

<https://doi.org/10.6084/m9.figshare.7038845.v1>

Data and information
for scientific research

Publication. 2017. *"Building essential biodiversity variables (EBVs) of species distribution and abundance at a global scale."* Kissling, W. Daniel, et al. Biological Reviews (2017).

Publication. 2015. *"Connecting people and ideas from around the world: global innovation platforms for next-generation ecology and beyond."* Jørgensen, Peter Sjøgaard, et al. Ecosphere 6.4 (2015): 1-11.

Poster. 2015. *"Proposed Requirements-driven User-scenario Development Protocol for the Belmont Forum E-Infrastructure and Data Management Cooperative Research Agreement."* Wee, Brian; Fitch, Peter; Car, Nicholas; Waldmann, Christoph; Percivall, George; Allen, David (2015). figshare.

<https://doi.org/10.6084/m9.figshare.1278893.v1>