MISSION

TO ADVANCE DISCOVERY, CREATE SOLUTIONS AND INFLUENCE DECISION-MAKERS TO POSITION THE UNIVERSITY OF QUEENSLAND AS A GLOBAL LEADER IN ADDRESSING THE CHALLENGES OF A CHANGING WORLD.

“Ninety-seven percent of scientists agree: climate change is real, man-made and dangerous.”
Barack Obama
United States President

“What is exciting about this challenge is that many solutions already exist, we just need to work out how to implement them.
And you can help. Climate change isn't just a problem facing a select few – we will all be impacted by 2050.”
Professor Ove Hoegh-Guldberg,
Director, Global Change Institute

“The Global Change Institute was founded on the promise of dealing with change; of managing and responding to it; of encouraging collaboration and exchange across disciplines. GCI stimulates thinking and generates new ideas to answer community puzzles and global problems.”
Penelope Wensley AC
Former Queensland Governor
Established in 2010, the Global Change Institute (GCI) is a unique collaborative hub drawing together resources from across The University of Queensland (UQ) to find solutions to the global challenges increasingly facing us all.

Collaborative research to address the impacts of climate change, technological innovation and population growth are at GCI’s core. Social scientists, economists and lawyers work side-by-side with marine biologists, physicists and medical practitioners to advance research across:

- Healthy Oceans
- Food Systems
- Renewable Energy
- Water.

GCI has formalised many of its relationships with UQ researchers through the College of Experts, a society of leading thinkers and innovators who come together to solve global challenges connected to the four research themes.

By partnering with researchers across UQ, GCI is leveraging a university in the top 100 globally. The University has an annual budget of over $1.6B, has received more Australian awards for teaching than any other university and maintains linkages with 373 institutional partners in 48 countries.

GCI collaborates with leading international universities and funding bodies. Engagement with government, community and business leaders results in policy transformation, improved health for residents in remote communities, and minimised coastal and water degradation.

Such remarkable impact requires an equally remarkable hub. Based in a $32m ‘Living Building’, GCI generates more energy than it consumes. The building is naturally ventilated, captures its own power through solar panels and stores up to 60,000L of rainwater.

GCI is a think-tank in which new ideas can flourish.

Its goals are to:

- Innovate
- Provide solutions
- Globally educate
- Engage champions
- Inspire
- Influence.

In the time it takes you to read this publication, 3111 babies will be born, 3.5 million megawatts of energy will be consumed and 6390 computers will be sold worldwide.

GCI is based in a six-star ‘Living Building’ made possible through the generosity of Institute Board member and philanthropist Graeme Wood AO.
The Global Change Institute is committed to meeting the challenge of change. By advancing discovery, creating solutions and influencing policymakers, the Institute is responding to the challenges presented by climate change, technological innovation and population change.

Marine biologists have opened the eyes of hundreds of millions of people to the world’s coral reefs by **photographing the oceans in 360° panoramic imagery** to create a baseline for future reef research.
GCI researchers have found 97% of scientists agree that climate change is caused by human activity.

Renewable energy researchers have developed Australia’s largest roof-mounted flat panel solar array generating 6% of the University’s energy and reducing greenhouse gas emissions by 1750 tonnes annually (equivalent to removing 335 cars from the road).

Researchers are working with governments, managers and communities to improve planning frameworks and develop business models to enhance local livelihoods and food security, and improve the health and wellbeing of coastal communities.

Water is humanity’s most valued commodity, used for agriculture (70%), industry (20%) and households (10%). UQ researchers are working towards long-term sustainability of water resources through facilitating system understanding and effective solutions to address the global water challenge, brokering external partnerships and engaging stakeholders.
Healthy Oceans

Oceans cover more than 70% of the earth’s surface and play a crucial role in determining weather, stabilising planetary temperature and regulating the atmosphere’s gas content. Without it, life would not be possible. Just like on land, climate change is having an increasing influence on ocean ecosystems. In discovering the linkages between a changing climate and the health of ecosystems, marine biologists are better able to predict future trends and impacts.

A 2012 study involving GCI researchers, and German and Canadian scientists concluded that it would be too hot for two thirds of the world’s oceans if global temperatures increased to two degrees above pre-industrial temperatures. The research found a failure to reduce greenhouse gas emissions would lead to the loss of most coral reefs by mid-to-late century.

GCI researchers are working to protect coastal communities and their economies from sea-level rise. Studies involving coastal households and businesses are informing policy development in island nations to protect communities from the worst impacts.

GCI researchers are also enabling people not directly impacted to connect with coral reefs. Catlin Seaview Survey marine biologists are conducting a worldwide reef assessment to determine the patterns and potential factors driving change in coral reef health. Seafloors in more than 15 countries have been surveyed, providing a scientific baseline to monitor reef change and thousands of images for people to view through Google Underwater Street View, generating 1.6B media impressions.

In 2013 Catlin Seaview Survey researchers studied more than 500km of seafloor with coral reefs in 11 countries.

Professor Ove Hoegh-Guldberg

Professor Ove Hoegh-Guldberg was the Contributing Lead Author on the Intergovernmental Panel on Climate Change’s first regional chapter on oceans and chaired the Blue Ribbon Panel for the World Bank’s Global Partnership for Oceans.
By 2050 food production will need to increase by 70 per cent in order to feed an estimated population of 9.6B people. Further, more people, particularly in developing countries, will be wealthier creating demand for a more varied, high-quality diet requiring additional production resources. There is growing concern that satisfying this demand will be increasingly challenging. Given the existing and likely effects of climate change, water shortages, declining fisheries, reduced availability of arable land and the diversion of food crops to bio-economies, food security is increasingly important.

In coming years, GOI’s Food Systems Program will focus on meeting the challenges these global environmental change factors bring in providing food security for millions of people in remote communities worldwide through:

- integrating the full set of food system activities with those of the food security outcomes
- assessing the impacts of global environmental change on food systems and identifying feedback to the system from food system activities
- helping to identify intervention points for enhancing food security, and analysing synergies and trade-offs between food security, ecosystem services and social welfare outcomes.

A key focus of the program will be to unlock the natural wealth of coastlines in the East Asia-Pacific region to assist in reducing extreme poverty and hunger in coastal communities. The Capturing Coral Reef and Related Ecosystem Services project, funded by the World Bank and Global Environment Facility (GEF), aims to value services provided to communities by coastal marine assets including fisheries, seagrass beds, mangrove trees and coral reefs, in the Philippines and Indonesia. Knowing the value of services provided by ecosystems will support the development of planning models and tools that harness this value and ensure local communities, businesses and policymakers preserve ecosystems (and their services) for the benefit of future generations.

One billion people in developing countries depend upon seafood for their main source of protein, half of which rely on fishing for their livelihood.

75 percent of the world’s 1.2 billion poor live and work in rural areas and depend on agriculture as their main source of income and employment.

United Nations Global Compact 2012

MELANIE KING

Melanie King has been involved in natural resource management and international development for more than 14 years, during which time she has managed and worked on, numerous research teams covering agricultural and marine issues. As the Director of Food Systems, Ms King is responsible for enabling communities to secure their future food, economic and ecological wealth through improved management of their ecosystems. She is currently completing her PhD investigating future scenarios for food security and the likely impacts on coastal communities in the Asia-Pacific region.
Across UQ there is a comprehensive portfolio of energy research, with significant programs in several areas of renewable energy. GCI has a number of projects in systems-level solar research including solar photovoltaic (PV) and solar thermal.

In 2014 researchers will turn on the southern hemisphere’s largest photovoltaic research facility at the University’s Gatton campus.

The Gatton PV Pilot Plant, funded through a $40.7m Australian Government grant and built in conjunction with US manufacturer First Solar, consists of a 3.275MW solar array with over 34,000 panels and 1MWh battery storage. At three times the size of the University’s existing flat panel solar array, the plant will provide 30 per cent of the Gatton campus’ energy. First Solar will use findings from the Gatton PV Pilot Plant to inform two commercial solar plants being built in New South Wales, Australia, by First Solar and renewable energy company AGL.

Further, the Gatton PV array will feed into an on-site battery storage system, allowing significant research into interactive yield management and assisting research into new methods of feeding power to the grid.

Ultimately, this research will pave the way for other renewable energy plants to play an increasingly complementary role and eventually help replace carbon-intensive power generation sources.

Four planet Earths would be required if all of humanity consumed resources at the same rate as United States residents.

World Wildlife Fund

"An energy breakthrough is the most important thing."

Bill Gates, Former Microsoft CEO and philanthropist
Freshwater is vital for survival – and yet one in nine people globally does not have access to clean drinking water and one in three lacks improved sanitation. There is an increasing need for cutting-edge science and innovation in the water arena to address the global demands for sustainably produced water, a safe water supply and healthy waterways.

Through the UQ Water Initiative, the University is committed to addressing the complexities of the global water challenge to improve access and ensure appropriate management of this vital resource. GCI is playing an important role in achieving this goal, delivering the University’s strengths in innovation and education by building strategic water research partnerships and facilitating adoption of this research into planning and policy. Increasingly, GCI is highlighting the key links between water, food, energy and our coasts.

The Australian Water and Environmental Research Alliance, a collaboration between UQ and Griffith University, is committed to linking basic research discoveries with practical problems to provide real world solutions to environmental and social challenges. The development of sustainable water resources, catchment management, and coastal resilience and recovery are focus areas for the Alliance.

Further, GCI researchers are working with NASA to explore water management tools for coral reefs. The resultant algorithm will enable satellite imagery to map water clarity and light availability in coral reef waters, and address questions including how ocean ecosystems and biodiversity are influenced by climate variability.

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Source: United Nations Water

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ASSOC. PROFESSOR EVA ABAL

Assoc. Professor Eva Abal’s scientific expertise and research interests include strategic research framework development; coordination of multidisciplinary projects; effective science communication; development of strategic road maps for eco-efficient water management; ecosystem health report cards and monitoring, evaluation and reporting; and improvement frameworks. Her passion is in the synthesis and effective communication of scientific information, making science relevant and useful to managers, and facilitating linkages between scientists, policymakers and other stakeholders.
IMPLEMENTING CHANGE

GCI is committed to achieving sustainable communities in the face of increasing population, urbanisation, increasing consumerism and technological change. Institute researchers understand that meeting the challenge of change requires a whole of humanity approach.

In addition to working with policymakers, lobbying governments and supporting regional strategies, the Institute is committed to communicating the importance of changing the way we live within developed countries.

None of this work is possible without funding. In addition to securing grants through globally recognised not-for-profit organisations, governmental agencies and academic institutions, GCI relies on philanthropic donations for its continued success. Your donation can be used to directly fund research, support a postgraduate student or continue engagement activities.

No commitment is too large or small – so contact the Institute to learn more about how we can meet the challenge of change together.

ANNA MOLONEY
Communications and Engagement Manager
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“Education is the key to engendering tolerance and overcoming ignorance. Our generation can and must make a mark in history by espousing altruism and responsible business practices to leave the world a better place for our children and grandchildren.”

Graeme Wood AO
GCI Board Member and Philanthropist, Entrepreneur and Environmentalist

“When 97 percent of scientists agree on anything, we need to listen, and we need to respond. Well, 97 percent of climate scientists have confirmed that climate change is happening and that human activity is responsible … They agree that the energy sources that we’ve relied on for decades are largely responsible for sending those greenhouse gases up into the atmosphere … And they agree that, if we continue to go down the same path that we are going down today, the world as we know it will change – and it will change dramatically for the worse.”

John Kerry
United States Secretary of State

“Climate change is most definitively not in reverse, I regret to say. Unless we do something about it, the world is going to continue to get warmer and warmer – and the consequences for future generations will be severe. The science tells us we cannot afford to relax, let up or wait for a miracle.”

The Right Honourable Edward Davey MP
UK Secretary of State for Energy
and Climate Change
HOW WILL YOU MEET THE CHALLENGE OF CHANGE?

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