

## Professor Stephen P Long FRS

Edward William and Jane Marr  
Gutgsell Endowed University  
Professor of Plant Biology  
and Crop Sciences

University of Illinois  
at Urbana-Champaign

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Born United Kingdom  
U.S. Citizen

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### EDUCATION

2007

D.Sc. Environmental Science (honoris causa), University of Lancaster, UK

1976

Ph.D. Plant Sciences, University of Leeds, UK

1972

B.Sc. (Honours, 1st class) Agricultural Botany, University of Reading, UK

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### PUBLICATION RECORD

H-Index (Google Scholar) = 83; 438 journal articles/edited book sections with 22,187 citations.

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### TENURED ACADEMIC APPOINTMENT

2008 –

**Edward William and Jane Marr Gutgsell Endowed University Professor of Plant Biology and of Crop Sciences**, Carl R. Woese Institute of Genomic Biology, University of Illinois at Urbana-Champaign

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### OTHER ACADEMIC APPOINTMENTS

2016 –

**Distinguished Professor of Crop Sciences, Lancaster Environment Centre**, Lancaster University, UK (2 months/yr)

2015 –

**Graduate Faculty**, Department of Bioengineering, University of Illinois at Urbana-Champaign

2013 –

**Center for Advanced Studies Professor**, University of Illinois at Urbana-Champaign

2012 –

**Director of RIPE**, Realizing Increased Photosynthetic Efficiency for improved crop production, Bill & Melinda Gates Foundation Project

2004 –

**Faculty**, Carl R. Woese Institute for Genomic Biology, University of Illinois at Urbana-Champaign

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### PRIOR ACADEMIC APPOINTMENTS

2007 – 2012

**Founding Deputy Director**, UC Berkeley, University of Illinois, and BP Energy Biosciences Institute

2006 – 2007

**Associate Head**, Department of Plant Biology, University of Illinois at Urbana-Champaign

1990 – 1998

**Professor**, Dept of Biological Sciences, University of Essex, UK

1978 – 1983

**Assistant Dean of Students**, University of Essex, UK

1975 – 1990

Successively, **Lecturer**, **Senior Lecturer** (1987), **Reader** (1988), Department of Biological Sciences, University of Essex, UK

2001 – 2002

**Faculty Fellow**, NSF National Center for Supercomputing Applications

1999 – 2008

**Robert Emerson Professor of Plant Biology and Crop Sciences**, University of Illinois at Urbana-Champaign

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## OTHER APPOINTMENTS

2012 –

**Invited Chair and Organizer**, Bill & Melinda Gates Foundation, Improving Crop Photosynthetic Productivity and Food Security, Seattle, WA

2010 – 2014

**Elected Advisor for BBSRC UK, Joint Programming Initiative (JPI) of the European Commission on “Agriculture, Food Security and Climate Change”**; reporting to the EU Commissioner for Agriculture, Brussels, Belgium

2010 – 2014

**External Advisor**, Wheat Yield Consortium, CIMMYT/USAID, GBRC, BBSRC

2010 – 2016

**SGE (Special Government Employee – hon.) Serving on the Federal Bioenergy Technical Advisory Board**, reporting to the Secretaries of Agriculture and of Energy, Washington DC. Re-appointed for second year term starting 2013

2008 –

**Hon. Professor of Biological Sciences**, University of Essex, UK

2003 – 2004

**Panel Manager**, USDA NRI Plants and Environmental Adaptation

2001

**Co-Chair**, NSF National Phytotron Review Group

1996 – 1998

**Director of Undergraduate Programs in Biology**, University of Essex

1995 – 2002

**Leader**, Working Group 1, EU-COST 819 European Shared Action on the Response of Pastoral Systems to Atmospheric Change

1993

**Visiting Professor**, Center for Primary Events in Photosynthesis, Department of Chemistry, Arizona State University, Tempe

1992 – 1999

**Visiting Scientist**, Brookhaven National Laboratory

1989 – 1990

**Gästprofessor**, Biology Center, University of Vienna

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## OFFICIES HELD IN PROFESSIONAL SOCIETIES

#### 2014-2017

**Chair**, Gordon Research Conferences (GRC) – CO<sub>2</sub> Assimilation in Plants (Vice-Chair 2011-2014)

#### 2013-2016

**Member**, Royal Society, Section 9 Committee (Chair 2014-16)

#### 2012-2013

**Congress Organizing Committee**, International Society for Photosynthesis Research,

**American Society of Plant Biologist (ASPB):**

**Co-Organizer**, Pan American Meetings on Plant and Bioenergy (2006-2012)

**Organizer and Chair**, Annual Meeting Symposium (2013)

**Committee member**, Charles F. Keetering Award Committee (2012-2014)

**Society for Experimental Biology:**

Plant Biology Committee (2012-2015)

Environmental Physiology Group Committee (2009– )

#### 2012-2013

**Co-organizer**, C<sub>4</sub>-CAM Photosynthesis Meeting, University of Illinois at Urbana-Champaign

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## FELLOWSHIPS & HONORS

#### 2017-18

**Elected Newton Abraham University Visiting Professor and Fellow Lincoln College**, University of Oxford, UK

#### 2015

**2015 University Lecturer** – Cornell University

#### 2014, 15 & 16

**Highly Cited Researcher** – 1 of 184 listed as highly cited by Thomson Reuters ISI in the Plant & Animal Science category <http://highlycited.com/>

**Listed by Thomson-Reuters as one of “The World’s Most Influential Scientific Minds of 2014”** based upon impact analysis of recent publications:  
<http://tmsnrt.rs/2fApZLY>

#### 2013

**Fellow of the Royal Society** (elected indefinitely, May 2013)

#### 2013

**Innovation Award of the International Society for Photosynthesis Research**, St. Louis, MO

#### 2013-15

**Appointed Visiting Professor of the Chinese Academy of Sciences**, Joint Max-Planck Institute of Computational Biology, Shanghai

#### 2013

**4th Annual Riley Memorial Lecturer**, World Food Prize/AAAS, Washington, D.C.

#### 2013

**2013 CeBiTec Annual Distinguished Lecturer**, Centrum für Biotechnologie, Universität Bielefeld, Germany

**2013**

**Appointed Center for Advanced Studies Professor**, University of Illinois at Urbana-Champaign

**2013**

**Re-appointed Edward and Jane Gutgsell Endowed University Professor of Plant Biology and Crop Sciences** (first appointment 2008), University of Illinois at Urbana-Champaign

**2012-16**

**Elected Fellow**, Rothamsted Research, Harpenden UK. One of 20 Fellows appointed to advise the Director of the world's oldest agricultural experimental research station on future directions.

**2012**

**Marsh Award for Climate Change Research**, British Ecological Society, Birmingham, UK

**2012**

**Charles F. Kettering Award for Excellence in Photosynthesis Research**, American Society of Plant Biologists, Austin, TX

**2012**

**Invited Expert on Food Security**, President's Council of Advisors on Science Technology (P-CAST), Washington, D.C.

**2011**

**Annual Trio Award for Science Research Education of Under-represented Minority Undergraduates**, University of Illinois, Urbana-Champaign, IL

**2010**

**BEGC Lecturer**, Harvard University, Cambridge, MA

**2009**

**Fellow of the American Society of Plant Biologists (ASPB)** (Elected July 2009)

**2009**

**18th Holden Botany Lecturer**, Sutton Bonnington, University of Nottingham

**2008**

**9th Annual Woolhouse Lecturer**, Society for Experimental Biology, Marseilles, France

**2008**

**Industry Summer School Lecturer**, MIT, Cambridge, MA

**2008**

**CMI Lecturer**, Princeton University, Princeton, NJ

**2008**

**The Heilborn Lecturer**, Northwestern University, Evanston IL (other 2008 Heilborn Lecturer was Steven Chu, prior Secretary of Energy and Nobel Prize Winner)

**2007**

**Honorary Doctor of Science (D.Sc.) for Global Change Research**, University of Lancaster, Lancaster, UK.

**2007**

**2nd Porter Alliance Lecturer**, Imperial College, London, UK

**2007**

**27th G.E. Blackman Lecturer**, University of Oxford, UK

2007

**Fellow of the American Association for the Advancement of Science (AAAS), Elected**

2007

**Invited to Brief President on Sustainable Bioenergy, White House, Washington, D.C.**

2005 – present

**Highly Cited. Listed as one of the 300 most cited authors in “Animal and Plant Biology”:** ISI Highly Cited and Science Citation Index <http://isihighlycited.com/>

2002 – present

**Most Cited. One of the 20 most cited authors on “Global Warming” by ISI Essential Science Indicators** ([www.esi-topics.com](http://www.esi-topics.com)); Science Citation Index

2006

**Campus Award for Excellence in Graduate Student Mentoring Honorable Mention**  
2006

2006

**UIUC-ACES Team Award for Excellence in Research, SoyFACE Global Change Research Team led by Dr. Stephen Long**

2006

**UIUC Incomplete List of Teachers Ranked as Excellent by Their Students for “Plants and Global Change”**

2005

**UIUC Incomplete List of Teachers Ranked as Excellent by Their Students for “Environmental Plant Physiology”**

2005

**McNair Movement Award:** For involvement of under-represented minorities in summer research

1999 – 2008

**Appointed Robert Emerson Professor of Plant Biology and of Crop Sciences, University of Illinois at Urbana-Champaign**

1998 – 2003

**Andrew Mellon Foundation personal award**

1989

**Smithsonian Institution Fellowship**

1972-1975

**University Scholar, University of Leeds, UK**

1972

**University Prize, University of Reading, UK**

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**LEADERSHIP**

2016 -present

**Leadership Team for the development of Photosynthesis 2.0.** European Commission, Brussels, Belgium.

2016 -present

**Advisor, International Wheat Yield Program (IWYP), CIMMYT/USAID, & BBSRC-UK**

### 2014-2016

**Chair, Sectional Committee 9 (Organismal biology, evolution and ecology)** Royal Society of London

### 2014

**Director, MEPP Program**, in Mobile Energy crop Phenotyping Platform under the American Recovery and Reinvestment Act (ARPA-E) with Cornell University and USDA-ARS.

### 2013

**Briefing with the Riley Foundations to USDA Under-Secretary for Research Education and Economics and Head of NIFA on the Gates RIPE project and the global competitiveness of US research in photosynthesis productivity improvement**, (Washington, D.C.)

### 2013

**Briefing to US Energy Secretary Steven Chu and ARPA-E Deputy Director Cheryl Martin** on the ARPA-E PETROSS Project (Washington, D.C.)

### 2012, 2015, 2016 & 2017

**Briefings to Bill Gates and the Bill & Melinda Gates Foundation** on opportunities to engineer photosynthesis for increased crop yields. Seattle, WA

### 2012

**Invited Expert on Food Security**, President Obama's Council of Advisors on Science Technology (P-CAST), Washington D.C.

### 2012

**Director, PETROSS Program**, in Plants Engineered To Replace Oil (PETRO) under the American Recovery and Reinvestment Act (ARPA-E) linking Brookhaven National Laboratory, and Universities of Nebraska, Florida and Illinois

### 2011

**Elected Co-Chair, Gordon Research Conferences – CO<sub>2</sub> Assimilation in Plants**

### 2011

**Founding Partner, Global Change Solutions LLC**, a consultancy company designing and reporting on strategies for companies to decrease their greenhouse gas footprint

### 2010

**Director, US-NSF/UK-BBSRC Joint Program – Exploiting Prokaryotic Proteins to Improve Plant Photosynthetic Efficiency (EPP)** Illinois-JGI-Cornell-Rothamsted

### 2010

**Elected Advisor, Joint Programming Initiative (JPI)** of the European Commission on "Agriculture, Food Security and Climate Change" reporting to the EC Commissioner of Agriculture, Brussels

### 2010-15

**External Advisor, Wheat Yield Consortium**, CIMMYT/USAID, GBRC & BBSRC; reporting to the Director-General CIMMYT, Mexico DF

### 2009

**Vatican Pontifical Academy of Sciences, Briefing on Bioenergy in the context of GMOs**, The Vatican, Rome, May 2009

### 2007

**Contributing Author to the UN Intergovernmental Panel on Climate Change (IPCC) – IPCC** was awarded the 2007 Nobel Peace Prize

2007

**Presidential Briefing** on Plant Feedstocks for Biofuels Mitigating Atmospheric Change, at the White House, Washington, D.C.

2007 –

**Principle Investigator**, Soybean-maize field facility for investigation of the direct effects of atmospheric change on crops (SoyFACE) [www.soyface.uiuc.edu](http://www.soyface.uiuc.edu)

2003 – present

**Director**, State (C-FAR) Special Research Initiative on biofuel crops [www.miscanthus.uiuc.edu](http://www.miscanthus.uiuc.edu)

2006

**Associate Head**, Department of Plant Biology, University of Illinois at Urbana-Champaign

2003 – 2004

**Panel Manager**, USDA NRI Plants and Environmental Adaptation

2001

**Co-Chair**, NSF National Phytotron Review Group

1996 – 1998

**Director of Undergraduate Programs in Biology**, University of Essex, UK

1995 – present

**Chief and Founding Editor** of the journal *Global Change Biology*; now ranked second among all Environmental Science journals listed by ISI, based on Impact Factor

1991–1998

**Director**, Environmental Biology Research, University of Essex, UK

1991–1995

**Coordinator**, Wheat & CO<sub>2</sub> coordinated national project, Biotechnology and Biological Sciences Research Council, UK

1993 – 1996

**Director**, M.Sc. Program in Crops and Global Change, University of Essex, UK

1992 – 1998

**Consortium Co-ordinator** (IV.1), Terrestrial Initiative in Global Environmental Research (TIGER), Natural Environment Research Council, UK

1983 – 1993

**Technical Co-ordinator**, United Nations Environment Programme (UNEP), Outer Limits Project on the Productivity of Tropical Grassland Systems

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## JOURNAL EDITOR

2007 – present

**Chief and Founding Editor**, *Global Change Biology – Bioenergy* (listed by Thompson ISI as the 2nd most highly cited journal on Agronomy), Impact Factor = 4.23

2007 – 2012

**Editorial Board**, *Proceedings of the Royal Society (London) B*

1994 – present

**Chief and Founding Editor**, *Global Change Biology*, (listed by Thompson ISI as the most highly cited journal on Climate Change, after *Science* and *Nature*), Impact Factor = 8.22

**1989 – present**

**Section Editor**, Plant Cell & Environment

**1990-4; 2000-3**

**Associate Editor**, Photosynthesis Research

**1985 – 1990**

**Editorial Board**, Journal of Ecology

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**NATIONAL/INTERNATIONAL RESEARCH FUNDING OR  
ADVISORY COMMITTEES (LAST FIVE YEARS):**

**2013; 2016**

**Visiting Committee**, Carnegie Institution for Science, Department of Plant Biology, Stanford University, CA

**2013 –**

**Working Group on Building Resilience to Climate Change**, Royal Society, London, UK

**2012 –**

**External Advisor**, UK Bioenergy Potential Assessment, BBSRC/University of Southampton, UK

**2012 –**

**Science Advisory Board**, BMGF Cluster of Excellence in Plant Sciences (CEPLAS) for Max-Planck Institute of Plant Breeding and Universities of Dusseldorf and Cologne

**2012 –**

**External Advisor**, Max Plank Institute of Plant Breeding, Cluster of Excellence in Plant Sciences

**2011 –**

**Bill & Melinda Gates Foundation**, Improving Crop Photosynthetic Productivity, Seattle, WA

**2011 –**

**External Advisor** to EU Framework 7 3TO4 Crop Improvement Programme, Brussels, Belgium (2012–)

**2011**

**Chair**, Drafting Group for the Energy Sustainability Challenge. Integrating groups from 16 Universities across 12 countries, London, UK

**2009 – 2010**

**Site Visitor and Review Panel**, A\*STAR Programmes in Bioenergy, Government of Singapore, Singapore

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**INVITED PRESENTATIONS (LAST FIVE YEARS)**

**Keynote Lecture** *Can we improve crop photosynthesis to feed the world sustainably?* The Festival of Plants, Botanic Gardens, University of Cambridge, UK (May 2017)

**Invited Presentation** *Realizing Increased Photosynthetic Efficiency for Sustainable Crop Yield Increases*. To Bill Gates, Advisers, Senior Program Staff and Director of Agriculture of the Bill & Melinda Gates Foundation, Seattle WA (May 2017)

**Invited Seminar** *Realizing Increased Photosynthetic Efficiency for Sustainable Crop Yield Increases (RIPE)*. Joint Annual Meeting of the Gates Foundation CASS and RIPE Projects. Il Ciocco, Italy (May 2017).



**Chair & Introduction** *Engineering Increased Photosynthesis for Food Security and Bioenergy*. Gordon Research Conference (GRC) CO<sub>2</sub> Assimilation in Plants from Genome to Biome. Il Ciocco, Italy (May 2017).

**Invited Presentation** *Realizing Increased Photosynthetic Efficiency for Sustainable Crop Yield Increases*. To the Board of the Foundation for Food and Agricultural Research (FFAR), Washington DC (April 2017)

**Invited Speaker** *Bioengineering Increased Photosynthetic Efficiency for Sustainable Crop Yield Increase*. The Bill & Melinda Gates Foundation, Seattle, WA (March 2017)

**Invited Centre Seminar** *Toward future sustainable food security by engineering increased photosynthetic efficiency in crops*. Lancaster Environment Centre, Lancaster University, UK (March 2017).

**Invited Speaker** *Opportunities to increase photosynthetic efficiency in corn for greater yield potential*. Illinois Annual Corn Breeders School, University of Illinois (March 2017).

**Invited Speaker** *Increasing Crop Productivity by Engineering Improved Photosynthetic Efficiency*. American Association for the Advancement of Science (AAAS) 2017 Annual Meeting, Boston, MA (Feb. 2017)

**Invited Seminar** *Making C4 Photosynthesis Cool*. University of Lancaster, Lancaster, UK (Nov. 2016).

**Invited Seminar** *Photosynthesis: The final frontier in improvement of crop yield potential and sustainability?* School of Natural Resources, University of Nebraska, Lincoln, NE (Oct. 2016).

**Invited Seminar** *Engineering Cool C4 Photosynthesis*. Plant Biology, Michigan State University, MI (Oct. 2016)

**Invited Plenary Speaker** *Realizing increased photosynthetic efficiency (RIPE)*. Bill & Melinda Gates Foundation Grand Challenges Meeting, Queen Elizabeth II Hall, London, UK. (Plus separate private presentation and Q&A to Bill Gates and Senior BMGF/UK Department for International Development Staff.) (Oct. 2016)

**Invited Speaker** *How to make sure your lab's innovations never make a difference (beyond your publication)*. Agriculture Research Track, Bill & Melinda Gates Foundation Grand Challenges Meeting, Queen Elizabeth II Hall, London, UK. (Oct. 2016)

**Invited Seminar** *Photosynthesis: the final frontier in improvement of crop yield and sustainability potential*. Plant Sciences Seminar Series, University of Nebraska, Lincoln, NB (Oct. 2016)

**Invited Lecture** *Croplands and rising atmospheric CO<sub>2</sub>*. Leverhulme Centre for Climate Change Mitigation – Opening Symposium, The Royal Society, London, UK (September 2016)

**Invited Keynote:** *Crop Production and Quality – Lessons from FACE and Future Needs*. FACE2FACE conference, Justus Liebig University Giessen, Germany (September 2016)

**Invited Keynote:** *Photosynthesis – the final frontier in improvement of crop yield potential*. Emerging Technologies for Global Food Security Conference, Global Institute for Food Security, Saskatoon, Canada (June 2016)

**Invited Presentation with Q&A** *Crops in silico concept*. Program Staff and Advisors of the Agricultural Development Initiative, Bill & Melinda Gates Foundation, Seattle, WA (June 2016)

**Invited Presentation with Q&A** *Realizing Increased Photosynthetic Efficiency for improvement of Crop Yield Potential*. Program Staff and Advisors of the Agricultural Development Initiative, Bill & Melinda Gates Foundation, Seattle, WA (June 2016)

**Invited Speaker** *Is variation in apparent sink-strength within germplasm of our major food crops sufficient to allow full realization of increased photosynthesis?* Annual Meeting, Society for Experimental Biology, Brighton, UK (June 2016)

**Invited Plenary** *Chilling C4 Photosynthesis*. C4 Photosynthesis Conference – 50 years of Discovery and Innovation, Canberra, Australia (April 2016)

**Invited Keynote** *Systems Approaches to Increasing Crop Productivity of Food and Energy Crops through Photosynthesis*. Swedish Renewable Energy Symposium, Umeå, Sweden (Feb 2016)

**Invited Seminar** *Feeding and Fueling the World in 2050 – Will it be Possible from Plants in 2050?* Plant Sciences Seminar Series, Penn. State University, College Park, PA (Feb. 2016)

**Invited Seminar** *Realizing Increased Photosynthetic Efficiency for Increased Crop Production – A Forward Look*. UK Government Chief Scientist and UK Department for International Development, London, UK (Jan. 2016)

**Invited Panel Presentation** *Sparing Not Sharing to Avoid Greenhouse Gas Emissions through Land Use Change to Feed a Growing World Population*. Climate Smart Agriculture Session, COP 21, Paris (Dec. 2015)

**Invited Seminar** *Realizing Increased Photosynthetic Efficiency for Increased Crop Production*. Syngenta Biotechnology, Raleigh, NC (Nov. 2015)

**EMSL Distinguished Lecturer:** *Feeding and Fueling the World from Crops will it be possible by 2050?* Pacific Northwest National Laboratory, Richland WA (Nov. 2015).

**Invited Keynote:** *Feeding and Fueling the World from Crops will it be possible by 2050?* Center for Advanced Study-25th Annual Lecture, University of Illinois, Urbana, IL (Oct 2015) Introduction by Dr. German Bollero.

**Keynote Lecture:** *Improving photosynthetic efficiency in silico and in vivo for improved crop productivity* Crop Phenomics Symposium, University of Nebraska, Lincoln (Oct 2015)

**Invited Talk:** *Biomass Energy feedstocks for NW China* Northwest Agriculture and Forestry University, Yangling, China (Oct 2015)

**Invited Seminar** *Realizing Increased Photosynthetic Efficiency for Increased Crop Production* Syngenta Crop Protection, Jealotts Hill, UK (Oct. 2015)

**Invited Seminar** *Systems and Synthetic Approaches to Adapting Crop Photosynthetic Productivity to Global Atmospheric Change* Agronomy, Iowa State University, Ames, IA (Oct. 2015)

**Invited Lecture:** *Engineering improved photosynthetic efficiency to increase crop yield potential and sustainability* Brazilian Congress of Plant Physiology, Foz do Iguaçu, Brazil (Sept. 2015).

**Invited Seminar** *Realizing Increased Photosynthetic Efficiency for Increased Crop Production* to Bill Gates and the Bill & Melinda Gates Foundation London Office, London, UK (Aug. 2015)

**Invited Talk:** *Realizing Improved Photosynthetic Efficiency in Crops under Global Change* Association of Applied Biologists, Lancaster, UK (June 2015)

**Invited Keynote:** *40 Years of Plant Science at Essex, Symposium Celebrating Steve Long's Election to the Royal Society, University of Essex, UK (June 2015)*

**Invited Seminar:** *Systems and Synthetic Approaches to Adapting Crop Productivity to Global Atmospheric Change* Section of Plant Biology, Seminar Series, Cornell (March 2015)

**Invited Lecture:** *Meeting the challenge of providing sufficient Food, Feed and Fuel from Crops under Global Atmospheric Change in 2030.* University Lecture Series, University of Leeds, UK (March 2015)

**Invited Lecture:** *Can We Feed and Fuel the World from Plants by 2050? Scientific vs Social Barriers* University Lecturer Series, Cornell (April 2015)

**Invited Seminar:** *Can we feed and fuel the world from plants by 2050? Scientific vs. social barriers* University of York, UK (March 2015)

**Invited Keynote:** *Adapting Midwest Cropping to Climate Change.* Center for Climatic Research UW, Annual Symposium, Madison WI (Mar 2015)

**Invited Lecture:** *Maximizing Yield Potential in the Face of Global Atmospheric Change.* Annals of Applied Biology Centenary Symposium, Rothamsted Research and Experimental Station, UK. (December, 2014)

**Invited Seminar** *Bioengineering in meeting the challenge of sufficient food and feed under Global atmospheric change by 2050.* China National Hybrid Rice Research and Development Center, Changsha, Hunan, China (Nov. 2014)

**Invited Plenary** *Systems and Synthetic Approaches to Adapting Crop Productivity to Global Change.* Plant Systems and Synthetic Biology Symposium, UNC Raleigh NC (Oct. 2014)

**Invited Seminar** *Can we have sufficient food and feed for 2050, while still expanding biofuels? The role of crop biotechnology and of new sustainable crops.* CAS Institute for Ecology and Plant Physiology, Shanghai, China (Oct. 2014)

**Invited Opening Seminar** *Can we have sufficient food and feed for 2050, while still expanding biofuels? The role of crop biotechnology and of new sustainable crops.* Feeding 9 Billion: A Path to Sustainable Agriculture – iSEE Congress, University of Illinois, Urbana IL (Oct. 2014)

**Invited Seminar** *Increasing productivity in the face of climate change through photosynthesis – the role of modeling.* Society for Experimental Biology – Plant Environmental Physiology Workshop, Lisbon, Portugal (Sept. 2014).

**Invited Talk** *The Direct Effects of Rising Carbon Dioxide and Surface Ozone on Midwest Crops, and Opportunities for Mitigation.* Workshop on Climate Change and Agriculture in the Midwest, Washington University, St. Louis MO (Sept. 2014).

**Invited Keynote:** *Food, Feed and Fuel from Crops under Global Atmospheric Change. Could we have it all in 2030?* Gatsby Foundation Summer School, York, UK (June 2014).

**Invited Talk:** *Computationally guided systems and synthetic biology approaches to increasing photosynthetic efficiency in crops.* University of Edinburgh, UK (June 2014).

**Invited Plenary:** *Meeting the Challenge of 70% More Food and Feed Production by 2050; With Particular Reference to Progress in Bioengineering of Crop Photosynthesis.* Plant Biology Europe. FESPB/EPSO 2014. Dublin, Ireland (June 2014).

**Invited Chair and Introduction:** *Photosynthesis and Global Atmospheric Change*  
Gordon Research Conference – CO<sub>2</sub> Assimilation in Plants: from Genome to Biome.  
Waterville Valley, NH (June 2014).

**Invited Talk:** *Toward the in silico Plant.* Future Perspective in Plant Biology, Plant, Cell & Environment meeting, Oxford, UK (June 2014).

**Invited Keynote:** *Sustainably delivering sufficient Food, Feed and Fuel by 2050 in the context of Global Change. What does “new biology” have to offer?* Sustainability and the Environment Research Showcase, University of Western Ontario, London ON (March 2014).

**Invited Talk:** *Toward the Virtual Plant.* DOE-BER Workshop – Computational Challenges for Mechanistic Modeling of Terrestrial Environments, Department of Energy, Germantown, MD (March 2014).

**Invited Talk:** *RIPE Realizing Increased Photosynthetic Efficiency for Improvement of Crop Yield Potential. An Overview.* Increasing Sink Strength in Cassava Convening Meeting, Bill & Melinda Gates Foundation, Munich, Germany (Feb. 2014).

**Invited Seminar:** *Bioengineering in Meeting the Challenge of Providing Sufficient Food, Feed and Fuel from Crops under Global Atmospheric Change in 2030.* Department of Bioengineering, University of Illinois, Seminar Series (Feb. 2014).

**Invited Talk:** *ARPA-E PETROSS: Bioengineering more productive, cold-tolerant and oil forming sugarcane and sweet sorghum to improve the viability of US biodiesel without conflict to food production.* Federal Biomass Research & Development Technical Advisory Committee of the USDA and US-DOE. Washington, DC (Feb. 2014).

**Invited Speaker:** *Toward Cool C<sub>4</sub> Crops.* Carnegie Institution, Stanford University, Palo Alto CA (Dec. 2013).

**Plenary Speaker:** *Engineering greater crop efficiency in CO<sub>2</sub> use. A key factor for acceptable land use in bioenergy production.* International Symposium – Toward the Use of Atmospheric CO<sub>2</sub> – from Photosynthesis to Biorefinery, University of Tokyo, Japan (Nov. 2013).

**Invited Speaker:** *A unified mechanistically rich framework for model prediction of the yields and ecosystem services of second-generation bioenergy crops.* The Global Sustainable Bioenergy Project – GSB/FAPESP Collaborative Meeting, – Atibaia/SP, Brazil (Nov. 2013).

**Invited Speaker:** *Improved Photosynthetic Efficiency to Increase Crop Yield Potential.* Share the Vision 2013, Conference Center, University of Illinois, IL (Oct. 2013).

**Keynote Speaker:** *Food, Feed and Fuel from Crops under Global Atmospheric Change. Could we have it all in 2030?* DOE ARPA-E PETRO Program Industry Meeting, Danforth Plant Science Center, St. Louis, MO. (Sept 2013).

**Plenary Speaker:** *Toward Cool C<sub>4</sub> Crops.* C<sub>4</sub>+CAM Plant Biology Conference, i-Hotel & Conference Center, University of Illinois, IL (Aug. 2013).

**Invited Speaker:** *Improving photosynthesis in crops, a means to food and energy security under climate change. Theory and evidence.* The Royal Society, London, UK (July 2013).

**4th Annual Riley Memorial Lecture:** *Food, Feed and Fuel from Crops under Global Atmospheric Change: Could we have it all in 2030?* AAAS Headquarters, Washington, D.C. (June 2013).

**Distinguished Annual Lecturer:** *Food, Feed and Fuel from Crops under Global Atmospheric Change. Could we have it all in 2030?* Center for Biotechnology, Bielefeld University, Germany (June 2013).

**Keynote Speaker:** *Increasing photosynthesis will increase crop yields. Is there evidence and are there means?* Cluster of Excellence on Plant Sciences (CEPLAS), Max-Planck Institute for Plant Breeding, Cologne, Germany (May 2013).

**Invited Overview Lecture:** *Identifying Limitations to Crop Photosynthesis.* Redesigning Photosynthesis Meeting, Banbury Center, Cold Spring Harbor Laboratories, NY (May 2013).

**Invited Session Speaker/Panelist:** *Engineering novel high productivity oil crops – PETROSS.* BIO International Convention, Chicago, IL (April 2013).

**Invited Speaker:** *More food, more bioenergy and fewer greenhouse gas emissions (GHGe) – is it possible.* American Chemical Society (ACS) Annual Meeting, New Orleans, LA (April 2013).

**Invited Speaker:** *PETROSS – Advantaged Oil-Producing Sugarcane and Sweet Sorghum.* Department of Energy ARPA-E Energy Innovation Summit, Washington D.C. (March 2013).

**Invited Lecturer:** *Increasing Photosynthesis will Increase Crop Yields – Evidence and Means.* Rothamsted Research, Harpenden, UK (January 2013).

**Invited Lecturer:** *Increasing Photosynthesis will Increase Crop Yields – Evidence and Means.* Biological Sciences, University of Essex, UK (January 2013).

**Invited Speaker:** *More food, more bioenergy and fewer greenhouse gas emissions.* British Ecological Society, Annual Meeting, Birmingham, UK. (December 2013).

**Invited Speaker:** *(GHGe) – is it possible?* American Geophysical Union (AGU), Annual Meeting, San Francisco, CA (December 2012).

**Invited Opening Speaker:** *Increasing Photosynthesis will Increase Crop Yields – Evidence and Means.* Rank Prize Funds Symposium, Grasmere, UK (October 2012).

**Invited Lecturer:** *Leaf gas exchange 2012, what does it tell us and what are the problems.* Plant Environmental Physiology Group Workshop, Lisbon, Portugal (September 2012).

**Invited Presentation:** *RIPE Realizing Increased Photosynthetic Efficiency for sustainable increases in crop yield.* Bill Gates and the Bill & Melinda Gates Foundation, Seattle, WA (July 2012).

**Invited Plenary Speaker:** *Why do we need plant biotechnology in our toolbox to feed and fuel the world?* Science with Impact, Society for Experimental Biology Annual Meeting, Salzburg, Austria (July 2012).

**Invited Lecturer:** *Feedstocks for Bioenergy.* UC Berkeley, CA (June 2012)

**Invited Lecturer:** *Systems and Synthetic Biology Approaches to Improving Crop Photosynthetic Productivity for a Changing Environment.* Carnegie Department of Plant Biology, Stanford University, Stanford, CA (April 2012)

**Opening and Plenary Speaker:** *Food, Feed and Fuel from Crops under Global Atmospheric Change. Could we have it all in 2030?* PLANTS2030, Potsdam, Germany (March 2012).

**Distinguished Lecturer:** *Food, Feed and Fuel from Crops under Global Atmospheric Change. Could we have it all in 2030?* Center for Global Change Science, University of Toronto, Canada (February 2012).

**Invited Speaker:** *More food, more bioenergy and fewer greenhouse gas emissions – is it possible?* Food Security Track at the American Association for the Advancement of Science Annual Meeting, Vancouver, Canada (February 2012).

**Invited Speaker:** *Rising to the challenge of feeding and fuelling a growing and more affluent global population.* Nicholas School of the Environment, Duke University, Durham, NC (February 2012).

**Invited Speaker:** *C4 Photosynthesis in the Cold.* Trinity College, University of Dublin, Dublin, Ireland (November 2011).

**Invited Speaker:** *Agriculture and Bioenergy Feedstocks.* Bioenergy Science and Technology Conference (BBEST 11), Sao Paulo, Brazil (August 2011).

**Invited Speaker:** *Exploiting Prokaryotic Proteins to Improve Plant Photosynthetic Efficiency. Surpassing Evolution.* First Joint Meeting of the US National Science Foundation (NSF) and the UK Biotechnology and Biological Sciences Research Council (BBSRC), Cambridge, UK (June 2011).

**Invited Chair:** *Energy Sustainability Challenge Meeting.* BP Headquarters, St. James, London, UK (June 2011).

**Invited Speaker:** *Feedstocks for Lignocellulosic Biofuels.* Rutgers-NSF IGERT Sustainable Fuels Solutions, Second Annual International Summer Symposium, Rutgers University NJ, USA (June 2011).

**Invited Speaker:** *Are there simpler options for increasing CO<sub>2</sub> at Rubisco in C<sub>3</sub> crops, than conversion to C<sub>4</sub>. Why and How?* Gordon Research Conference – CO<sub>2</sub> Assimilation in Plants: Genome to Biome, Les Diablerets, Switzerland (May 2011).

**Invited Speaker:** *Thinking Outside the Lunch Box: C<sub>4</sub> Perennial Feedstocks Could Provide Significant Replacement of Fossil Fuel Energy with Sustainability and without Conflict with Food Production.* 2011 Symposium on Plants for the Future, Columbia, MO (May 2011).

**Keynote and Introductory Speaker:** *Radiochemical Imaging to Improve Plant Productivity and Sustainability for Food and Energy – A View from the Stands.* DOE Radiochemistry and Imaging Instrumentation Workshop. Washington, D.C. (April 2011).

**Plenary Speaker:** *More food, more bioenergy and fewer greenhouse gas emissions – is it possible?* Royal Society Discussion Meeting on Reducing Greenhouse Gas Emissions from Agriculture, London, UK (February 2011).

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## RESEARCH GROUP (2013/14)

**Personal Research Group:** 4 Ph.D. candidates as major advisor; 7 postdoctoral fellows; 4 academic professional support staff. (Previously, advised 40 PhD and 14 MSc/MS students graduated at the Universities of Essex and Illinois.)

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## OFFICES HELD IN PROFESSIONAL SOCIETIES (PAST FIVE YEARS)

### 2011-2017

#### Vice-Chair and Chair

Gordon Research Conferences (GRC) – CO<sub>2</sub> Assimilation in Plants

2012-13

**Congress Organizing Committee**

International Society for Photosynthesis Research

American Society of Plant Biologists (ASPB):

- Pan American Meetings on Plants and Bioenergy, **Co-organizer (2006 – 2012)**
- Publications Committee **(2010 – 2014)**
- Annual Meeting Symposium **Organizer and Chair (2013)**
- **Charles F. Kettering Award Committee (2012 – 2014)**

Society for Experimental Biology:

- **Plant Biology Committee (2010 –)**
- **Environmental Physiology Group Committee (2009 –)**

Royal Society: **Section 9 Committee (2013 – 2016)**

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**OUTREACH (PAST FIVE YEARS)**

Long's research featured in:

**People Behind the Science** “Shedding light on how optimizing photosynthesis could increase plant productivity” <http://www.peoplebehindthescience.com/dr-stephen-long/>

**New York Times**. Front Page Article: “A Warming Planet Struggles to Feed Itself”

**Herald Tribune**. Front Page Article: “Can a Warming Planet Struggles to Feed Itself”

**Newsweek International Forum on Energy**, hosted by Fareed Zakaria, Long was one of three panelists, the others were former Senator Gingrich and Congressman Peterson at the Press Club, Washington D.C.

**Voice of America News** “Scientists find Global Warming Hurts Crops”

**BBC Radio 4 The Leading Edge** “Crops and Climate Change”

**BBC World Service** – Science in Action Program “Crops, Climate Change and Food Supply”

**BBC World Service** – 30-minute program in series “One World Too Hot to Feed” devoted to the SoyFACE experiment and the implications of its findings

**San Francisco Chronicle**, “Modern Wildcatters See Gushers of Green”

**Chicago Tribune**, “Illinois Great Energy Hunt”

**The Irish Times**, “Elephant grass could meet some electricity needs”

**Nature, News & Views** “Hikes in surface ozone could suffocate crops”

**AAAS/World Food Prize/Riley Foundation**, Panel Discussion on Challenges and the Future of Agricultural Research. Long was one of four panelist, the others were Pam Johnson, President, National Corn Growers Association; Sonny Ramaswamy, Director, National Insitute of Food and Agriculture; Richard Bonnanno, President, Massachusetts Farm Bureau Federation. AAAS HQ, Washington, DC.

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**EXTERNALLY AWARDED COMPETITIVE FUNDING  
(SINCE JOINING ILLINOIS IN 1999)**

Leakey, A.D.B., Long, S.P., Ort, D.R., Brown, Bernacchi, C.J., P.J., Burke, J.J., Spalding, E.P., Buckler, E.S., Gore, M., Clemente, T.E. (submitted 2015; awarded 2016) **Novel Technologies to Solve the Water Use Problem of High Yielding C4 Bioenergy and Bioproduct Feedstocks** – Department of Energy, ARPA-E OPEN \$4,995,967 (through 2019)

Long, S.P., Acevedo-Siaca, L. (submitted 2015; awarded 2016) **Identifying differences in photosynthetic Efficiency within the 5 Subpopulations of Oryza Sativa and Use of Candidate Gene Association Mapping for Targeted Plant Improvement** – Purdue Center for Global Food Security \$18,095 through 2017

Long, S.P., Bernacchi, C.J., Peschel, J.M., Ort, D.R., Brown P.J., LeBauer, D.S., Zakhor, A., Buckler, E.S., Gore, M. (submitted 2015; award 2015) **Mobile Energy-Crop Phenotyping Platform (TERRA-MEPP)** – Department of Energy, ARPA-E TERRA \$3,100,000 through 2017.

Long, S.P., Ort, D.R., Marshall-Colón, A. Dalling, J.W., Bollero, G., Allen, G.D., Lipka, A.E., DeLucia, E.H., Cox, D.J. (submitted 2015; awarded 2015) **Plants In Silico: Towards Realizing the Opportunity** – University of Illinois Olga G. Nalbandov Lecture Fund \$20,000 through 2016

Long, S.P., Ort, Marshall-Colón, Seidel, H.E., Shukla, D., O'Dwyer, J., Zhu, X.G. (submitted 2015; awarded 2015) **Plants in silico: A Multiscale Modeling Platform to Predict Crop Response to Climate Change** – Illinois Institute for Sustainability, Energy and Environment at the University of Illinois at Urbana-Champaign \$350,000 through 2018

Sacks, E.J., Long, S.P., Peng, J., Yamada, T. (submitted 2014; awarded 2014) **Quantifying phenotypic and genetic diversity of Miscanthus sacchariflorus to facilitate knowledge-directed improvement of M. x giganteus (M. sinensis x M. sacchariflorus) and sugarcane**, Department of Energy, BER. \$1,496,252 over 3 years.

Long, S.P., Bernacchi, C.J., Bollero, G., DeLucia, E.H. (submitted 2013; awarded 2013) **Feedstock Production and Ecosystem Services Modeling Program**, Energy Biosciences Institute. \$1,280,000 for 2014 and 2015.

Long, S.P., Ort, D.R., Badger, M.R., Parry, M.A.J., Raines, C.A. (submitted 2012; awarded 2012) **RIPE – Realizing Increased Photosynthetic Efficiency**, Bill & Melinda Gates Foundation \$25,000,000 for the initial 5 years.

Long, S.P., Altschuler, F., Clemente, T., Moose, S.P., Ort, D.R., Sacks, E., Shanklin, J. (submitted 2011; awarded 2012; renewed 2014; renewed 2016) **Engineering Hydrocarbon Biosynthesis and Storage Together with Increased Photosynthetic Efficiency into the Saccharinae** – Department of Energy, ARPA-E PETRO \$7,056,040 through 2017.

Long, S.P. (submitted 2011, awarded 2012) **Increasing the Biomass Resource**. Danish Council for Strategic Research, Denmark \$270,118 over 4 years.

DeLucia, E.H., David, M.B., Khanna, M., Long, S.P., Teixeira-Anderson, K., Voigt, T.B. (submitted 2010, awarded 2011) **Using Second Generation Biofuel Feedstocks To Improve The Carbon Economy Of US Agriculture**, Department of Energy, SunGrant \$644,517 over 3 years.

Sacks, E.J., Long, S.P. (submitted 2011, awarded 2011) **Quantifying Phenotypic and Genetic Diversity of Miscanthus sinensis As A Resource For Knowledge-Based Improvement Of M. X giganteus (M. sinensis X M. sacchariflorus)**, Department of Energy, BES \$999,218 over 3 years.



Long, S.P. (submitted 2010, awarded 2011) **Collaborative Research: Exploiting Prokaryotic Proteins to Improve Plant Photosynthetic Efficiency**. National Science Foundation EF. \$368,728 over 3 years.

Ort, D.R., Long, S.P. (submitted 2008, awarded 2008) **Soyface Global Change Research**, US Department of Agriculture \$714,574 over 2 years.

Somerville, C.R., Keasling, J., Long, S.P. (submitted 2006, awarded 2007) The UC Berkeley – University of Illinois – BP Energy Biosciences Institute (EBI) BP plc \$500,000,000 over 10 years

Long, S.P., Leakey, A.D., DeLucia, E.H., Ort, D.R. **How will the Midwest Agroecosystem respond to drought and rising (CO<sub>2</sub>)**, Department of Energy, National Institute for Climate Change Research \$394,000 over 3 years

Diers, B.D., Ainsworth, E.A., Long, S.P., Ort, D.R. **Toward Reducing Soybean Yield Losses Caused by Ozone**, CFAR Sentinel \$284,759 over 2 years

Long, S.P., **Soybean Disease Biotechnology Center IV-Ozone Impacts**, USDA \$250,000 over 3 years

Kumar, K., Liang, X-Z., Long, S.P., Murugesu, S. (submitted 2006, awarded 2007) **Interactions between Water, Energy and Carbon Dynamics as Predictors of Canopy to Ecosystem Scale Vegetation Pattern and Function in a Changing Environment**, National Science Foundation \$1,650,000 over 4 years

Long, S.P., Khanna, M., Letterley, G. (submitted 2005, awarded 2006) **Biomass Heat and Power in Illinois, DSystems**, Dudley Smith Foundation \$300,000 over 4 years

Mott, K., Long, S.P., Assmann, S. (submitted 2005, awarded 2006), **The Biology of Transpiration Meetings Proposal**, National Science Foundation \$16,500 over 1 year

Long, S.P., Portis, A.R., Moose, S.P. (submitted 2004, awarded 2005) **Adaptation of C<sub>4</sub> Photosynthesis to Cold within the Miscanthus Genus**, National Science Foundation \$452,255 over 3 years

Long, S.P., DeSturler, E. (submitted 2004; awarded 2004). **Unifying Mechanistic Dynamic Models of Photosynthesis and Stomatal Movement – Collaborative Research**, National Science Foundation \$395,000 over 3 years

DeLucia, E.H., Berenbaum, M., Clough, S., Long, S.P., Ort, D.R. (submitted 2004; awarded 2004) **Genomic regulation of the response of an agroecosystem to elements of global change**, Department of Energy – Program for Ecosystems Research \$2,984,000 for 3 years

Long, S.P. (lead PI) and 12 co-Pis (submitted 2003; awarded 2003) **Biomass Energy Crops for Power and Heat Generation in Illinois, Diversifying Cropping, Improving Energy Security and Benefiting the Environment**. C-FAR-SRI \$1,195,000 over 5 years

Long, S.P., Portis, A.R., Moose, S.P. (submitted 2001; awarded 2002) **Novel cold-tolerant rhizomatous C<sub>4</sub> grasses: A resource for transforming photosynthesis in corn at low temperatures**, USDA-NRI \$187,000 over 3 years

Ort, D.R., Long, S.P. (submitted 2002; awarded 2002) **Effects of open-air elevation of ozone and carbon dioxide on soybean transpiration**, IALC \$88,000 over 2 years

Wander, M., Long, S.P., Tracy, B., Khanna, M. (submitted 2003; awarded 2003), **Opportunities in Energy and Agriculture**, Dudley Smith Initiative \$61,000 year 1 renewable for 5

Wander, M., Long, S.P., Tracy, B., Khanna, M. (submitted 2002; awarded 2002), **Opportunities in Energy and Agriculture**, Dudley Smith Initiative \$40,000 over 1 year

Ort, D.R., Long, S.P. (submitted 2003; awarded 2003) **Effects of open-air elevation of carbon dioxide on canopy evapotranspiration of corn grown at SoyFACE**, Campus Research Board \$16,450

Long, S.P. (submitted 2001; awarded 2001) **Does an elevated CO2 concentration decrease dark respiration in trees? A novel approach using differential oxygen analysis**, Department of Energy-OBER/TCP \$134,000 over 2 years (renewal Aug. 2001-Aug 2003)

Whitmarsh, J.; Long, S.P. (submitted 2001; awarded 2001) **Towards the Photosynthesis Workbench – “e-Photosynthesis,”** National Center for Supercomputer Applications \$18,500 over 1 year (Completed Aug. 2002)

Long, S.P., Voigt, T., Tracy, B. (submitted 2001; awarded 2001) **Miscanthus: A geographically adapted grass biomass crop for permaculture and soil improvement**, C-FAR Internal \$70,000 over 3 years

Long, S.P., co-PIs: DeLucia, E.H., Ort, D.R. (submitted 1999; awarded 2000) **SOYFACE Research and Discovery Program to Abate the Threats and Harness the Potential of Atmosphere Change to Benefit Illinois Agriculture**, Collaborators: G. Bollero, D. Briskin, D. Bullock, D. Bush, M. David, J. Dawson, B. Diers, N. Engeseth, G. Fahey, S. Hollinger, R. Nelson, A. Portis, and M. Wander, C-FAR Sentinel \$1,700,000 total over 5 years

Long, S.P., co-PI: Moose, S.P. (submitted 1999; awarded 2000) **A Novel Source of Cold-tolerant C4 Photosynthesis for Maize**, USDA-NRI \$130,000 over 2 years

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**GIFTS TO SUPPORT RESEARCH (SINCE JOINING ILLINOIS IN 1999)**

Archer Daniels Midland: Provision of CO2 to the SoyFACE project, This decreases our CO2 costs from a market price of \$100-\$150 per ton, to \$40 per ton; total value approximately \$100,000 per year (2002 –)

BASF: \$10,000 toward costs of a drought experiment within SoyFACE (Joint with D.R. Ort)

Bayer Chemicals: \$20,000 towards costs of an ozone experiment within SoyFACE

Brookhaven National Laboratory: \$6,250 towards gas costs in SoyFACE

Pioneer Hi-Bred: Seed for 80 acres at SoyFACE; total value approximately \$6,000 per year since 2002

Andrew Mellon Foundation: \$22,000 Personal award for research at Kennedy Space Center (Administered through the Smithsonian Institution)

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**REVIEW PANELS SERVED ON**

**2014**

**Institute for Sustainability, Energy and Environment UIUC**, Pre- and Full Proposal Review Panel

**2013**

**EU Review Panel for Proposals on ERA-NET Plus on Climate Smart Agriculture**, under the Agriculture, Food Security and Climate Change Joint Programming Initiative.

## 2011

**Site Visitor and Review Panel**, A\*STAR Programs in Bioenergy, Government of Singapore, Singapore.

## 2011– 2014

**UC-Berkeley-LBNL-U Illinois-BP Energy Biosciences Institute**, Award Review Panels x 4 annually.

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## OTHER INTERESTS

**Vision Circle Member** (2010 – Present) – PBS-WILL

**Marquee Circle Member** (2009 – Present) – Krannert Center for the Performing Arts

**Event Sponsor** Maifa Symphony Orchestra (2013) and Symphony Orchestra of Mexico (2014)– Krannert Center

**Member: Second Wind Running Club** (2003 – Present)

**Race Sponsors:** – Mettler Athletic, Champaign, IL; Body & Sole, Savoy, IL

**Top 20 finisher**, age group, 2005 and 2007 Chicago Marathon; **Top 5** US Mid-East Sprint Triathlon, 2010; Tri-Illini 2024, 15; Naples Half Marathon 2015; Naples Fall Classic Half Marathon, 2016; Illinois Half Marathon 2015, 17. Age Group 1st place Champaign Mini-tri 2013, 14, 15; Effingham Tri; 2015; Qualifier; Nationals (Triathlon) 2016

**Hood-to-Coast Relay 200 mile relay**; Team placed 15/250 in Men’s Open Division

**Boston Marathon Qualifier**, 2004, 2005, 2006, 2007, 2008, 2009

**Member UIUC Plant Biology “Photons” Team**; the overall Winners of the Lake Geneva WI Team Marathon (2005); Wolf Creek IL Sprint Triathlon (2006); Lake Mattoon Half-Iron Triathlon (2006); Illinois Marathon (2013; 2016)

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## PUBLICATIONS

### A. PAPERS IN REFEREED JOURNALS

WANG, Y., SONG, Q., JAISWAL, D., DE SOUZA, AP., LONG, SP. & ZHU, X.-G. (2017) Development of a Three-Dimensional Ray-Tracing Model of Sugarcane Canopy Photosynthesis and Its Application in Assessing Impacts of Varied Row Spacing. *BioEnergy Research*, 10: doi:10.1007/s12155-017-9823-x

MARSHALL-COLON, A., LONG, SP., ALLEN, DK., ALLEN, G., BEARD, DA., BENES, B., VON CAEMMERER, S., CHRISTENSEN, A., COX, DJ. HART, JC. (2017) Crops in silico: Generating virtual crops using an integrative and multi-scale modeling platform. *Frontiers in Plant Science* 8: 786.

KANTOLA, IB., MASTERS, MD., BEERLING, DJ., LONG, SP. DELUCIA, EH. (2017) Potential of global croplands and bioenergy crops for climate change mitigation through deployment for enhanced weathering. *Biology Letters* 13: 20160714.

HUANG, H., MOREAU, RA., POWELL, MJ., WANG, Z., KANNAN, B., ALTPETER, F., GRENNAN, AK., LONG, SP. & SINGH, V. (2017) Evaluation of the quantity and composition of sugars and lipid in the juice and bagasse of lipid producing sugarcane. *Biocatalysis and Agricultural Biotechnology* 10: 148-155.

HAY, W.T., BIHMIDINE, S., MUTLU, N., LE HOANG, K., AWADA, T., WEEKS, D.P., CLEMENTE, T.E., LONG, S.P. (2017) Enhancing soybean photosynthetic CO<sub>2</sub> assimilation using a cyanobacterial membrane protein, ictB. *Journal of Plant Physiology* 212: 58-68.

LEBAUER, D., KOOPER, R., MULROONEY, P., ROHDE, S., WANG, D., LONG, SP., DIETZE, MC. (2017) BETYDB: a yield, trait, and ecosystem service database applied to second-generation bioenergy feedstock production. *Global Change Biology Bioenergy*. 9: doi:10.1111/gcbb.12420

\*PIGNON, C.P., JAISWAL, D., McGRATH, J.M., LONG, S.P. (2017) Loss of Photosynthetic efficiency in the shade. An Achilles heel for the dense modern stands of our most productive C4 crops? *Journal of Experimental Botany*. 68: 335-345.

\*DE SOUZA, A.P., MASSENBURG, L.N., JAISWAL, D. CHENG, S., SHEKAR, R., LONG, S.P. (2017) Rooting for cassava: Insights Into photosynthesis and associated physiology as a route to improve yeild potential. *New Phytologist*. 213: 50-65.

SRINIVASAN, V., KUMAR, P., LONG, S. P. (2017). Decreasing, not increasing, leaf area will raise crop yields under global atmospheric change. *Global Change Biology* 23: 1626–1635.

SONG, Q., CHEN, D., LONG, S.P., Zhu, X-G. (2017) A user-friendly means to scale from the biochemistry of photosynthesis to whole crop canopies and production in time and Space – development of Java WIMOVAC. *Plant, Cell & Environment*. 40: 51-55

KOHLER, IH., RUIZ-VERA, UM., VANLOCKE, A., THOMEY, ML., CLEMENTE, T., LONG, SP., BERNACCHI, CJ. (2017) Expression of cyanobacterial FBP/SBPase in soybean prevents yield depression under future climate conditions. *Journal of Experimental Botany* 68: 715-726.

\*KROMDIJK, J., GLOWACKA, K., LEONELLI, L., GABILLY ST., IWAI, M., NIYOGI, KK., LONG, SP (2016) Improving photosynthesis and crop productivity by accelerating recovery from photoprotection. *Science* 354: 857-860

GRAY, SB., DERMODY, O., KLEIN, SP., LOCKE, AM., MCGRATH, JM., PAUL, RE., ROSENTHAL, DM., RUIZ-VERA, UM., SIEBERS, MH, STRELLNER, R, AINSWORTH, EA, BERNACCHI, CJ, LONG, SP, ORT, DR, LEAKEY, AD (2016). Intensifying drought eliminates the expected benefits of elevated carbon dioxide for soybean. *Nature Plants*, 2: article 16132.

HUANG H., LONG S. & SINGH V. (2016) Techno-economic analysis of biodiesel and ethanol co-production from lipid-producing sugarcane and sweet sorghum. *Industrial Biotechnology* 12, 357-365.

KROMDIJK J, LONG SP. (2016). One crop breeding cycle from starvation? How engineering crop photosynthesis for rising CO<sub>2</sub> and temperature could be one important route to alleviation. *Proceedings of the Royal Society B*, 283: article.2015.2578

WEBSTER RJ, DRIEVER SM, KROMDIJK J, MCGRATH J, LEAKEY, ADB, SIEBKE K, DEMETRIADES-SHAH T, BONNAGE S, PELOE T, LAWSON T, LONG SP. (2016). High C<sub>3</sub> photosynthetic capacity and high intrinsic water use efficiency underlies the high productivity of the bioenergy grass *Arundo donax*. *Scientific Reports* 6: article.20694

SOLEH MA, TANAKA Y, NOMOTO Y, IWAHASHI Y, NAKASHIMA K, FUKUDA Y, LONG SP, SHIRAIWA T. (2016). Factors underlying genotypic differences in the induction of photosynthesis in soybean [*Glycine max* (L.) Merr.] *Plant, Cell & Environment* 39: 685-693.

GŁOWACKA K., KROMDIJK J., LEONELLI L., NIYOGI KK., CLEMENTE TE., LONG SP. (2016). An evaluation of new and established methods to determine T-DNA copy number and homozygosity in transgenic plants. *Plant Cell and Environment* 39: 908-917.

HUDIBURG T.W., WANG W.W., KHANNA M., LONG S.P., DWIVEDI P., PARTON W.J., HARTMAN M. & DELUCIA E.H. (2016) Impacts of a 32-billion-gallon bioenergy landscape on land and fossil fuel use in the US. *Nature Energy*, 1, 1-7.

LIN T., RODRÍGUEZ L.F., DAVIS S., KHANNA M., SHASTRI Y., GRIFT T., LONG S.P. & TING K. (2016) Biomass feedstock preprocessing and long-distance transportation logistics. *Global Change Biology Bioenergy*, 8: 160-170.

GLOWACKA K., AHMED A., SHARMA S., ABBOTT T., COMSTOCK J.C., LONG S.P. & SACKS E.J. (2016) Can chilling tolerance of C4 photosynthesis in *Miscanthus* be transferred to sugarcane? *Global Change Biology Bioenergy*, 8: 407-418.

SAKODA K., TANAKA Y., LONG S.P. & SHIRAIWA T. (2016) Genetic and Physiological Diversity in the Leaf Photosynthetic Capacity of Soybean. *Crop Science*, 56: 2731-2741.

GUSTAFSON D., HAYES M., JANSEEN E., LOBELL D.B., LONG S.P., NELSON G.C., PAKRASI H.B., RAVEN P., ROBERTSON G.P., ROBERTSON R. & WUEBBLES D. (2016) Pharaoh's Dream Revisited: An Integrated US Midwest Field Research Network for Climate Adaptation. *BioScience*, 66: 80-85.

LARSEN S., JAISWAL D., BENTSEN N.S., WANG D. & LONG S.P. (2015) Comparing predicted yield and yield stability of willow and *Miscanthus* across Denmark. *Global Change Biology Bioenergy*, 8: 1061-1070.

DAVIS, S.C., MING, R., LEBAUER, D.S., LONG, S.P. (2015). Toward systems-level analysis of agricultural production from crassulacean acid metabolism (CAM): scaling from cell to commercial production. *New Phytologist*, 208: 66-72.

GŁOWACKA, K., JØRGENSEN, U., KJELDSEN, J.B., KØRUP, K., SPITZ, I., SACKS, E.J., LONG, S.P. (2015). Can the exceptional chilling tolerance of C4 photosynthesis found in *Miscanthus x giganteus* be exceeded? Screening of a novel *Miscanthus* Japanese germplasm collection. *Annals of Botany*, 115: 981-990.

WAY D.A. & LONG S.P. (2015) Climate-smart agriculture and forestry: maintaining plant productivity in a changing world while minimizing production system effects on climate. *Plant, Cell & Environment*, 38: 1683-1685.

ARUNDALE, R.A., BAUER, S., HAFFNER, F.B., MITCHELL, V.D., VOIGT, T.B., LONG, S.P. (2015). Environment Has Little Effect on Biomass Biochemical Composition of *Miscanthus x giganteus* Across Soil Types, Nitrogen Fertilization, and Times of Harvest. *Bioenergy Research*, 8: 1636-1646.

WANG, D., JAISWAL, D., LEBAUER, D.S., WERTIN, T.M., BOLLERO, G.A., LEAKEY, A.D.B., LONG, S.P. (2015). A physiological and biophysical model of coppice willow (*Salix* spp.) production yields for the contiguous USA in current and future climate scenarios. *Plant, Cell & Environment*, 38: 1850-1865.

LONG, S.P., MARSHALL-COLON, A., XIN-GUANG, Z. (2015). Meeting the Global Food Demand of the Future by Engineering Crop Photosynthesis and Yield Potential. *Cell*, 161: 56-66.

- ORT, D.R., MERCHANT, S.S., ALRIC, J., BARKAN, A., BLANKENSHIP, R.E., BOCK, R., CROCE, R., HANSON, M.R., HIBBERD, J.M., LONG, S.P., MOORE, T.A., MORONEY, J., NIYOGI, K.K., PARRY, M.A.J., PERALTA-YAHYA, P.P., PRINCE, R.C., REDDING, K.E., SPALDING, M.H., VAN WIJK, K.J., VERMAAS, W.F.J., VON CAEMMERER, S., WEBER, A.P.M., YEATES, T.O., YUAN, J.S., ZHU, X.G. (2015). Redesigning photosynthesis to sustainably meet global food and bioenergy demand. *Proceedings of the National Academy of Sciences*, 112: 8529-8536.
- DWIVEDI, P., WANG, W., HUDIBURG, T., JAISWAL, D., PARTON, W., LONG, S.P., DELUCIA, E., KHANNA, M. (2015) Cost of Abating Greenhouse Gas Emissions with Cellulosic Ethanol. *Environmental Science & Technology* 49: 2512-2522
- DELUCIA, E.H., GOMEZ-CASANOVAS, N., GREENBERG, J.A., HUDIBURG, T.W., KANTOLA, I.B., LONG, S.P., MILLER, A.D., ORT D.R., PARTON W.J. (2014) The Theoretical Limit to Plant Productivity. *Environmental Science & Technology* 48: 9471-9477
- DAVIS, S.C., LEBAUER, D.S., LONG, S.P. (2014). Light to liquid fuel: theoretical and realized energy conversion efficiency of plants using Crassulacean Acid Metabolism (CAM) in arid conditions. *Journal of Experimental Biology*, doi: 10.1093/jxb/eru163.
- CLARK, L.V., BRUMMER, J.E., GLOWACKA, K., HALL, M., HEO, K., PENG, J., YAMADA, T., YOO, J.H., YU, C.Y., ZHAO, H., LONG, S.P., SACKS, E.J. (2014). A footprint of past climate change on the diversity and population structure of *Miscanthus sinensis*. *Annals of Botany*, 114: 97-107.
- ARUNDALE, R.A., DOHLEMAN, F.G., VOIGT, T.B. & LONG, S.P. (2014). Nitrogen Fertilization Does Significantly Increase Yields of Stands of *Miscanthus x giganteus* and *Panicum virgatum* in multi-year Trials in Illinois. *Bioenergy Research*, 7: 408-416.
- ARUNDALE, R.A., DOHLEMAN, F.G., HEATON, E.A., MCGRATH, J.M., VOIGT, T.B. & LONG, S.P. (2014). Yields of *Miscanthus x giganteus* and *Panicum virgatum* decline with stand age in the Midwestern USA. *Global Change Biology Bioenergy*, 6: 1-13.
- LONG, S.P. (2014). We need winners in the race to increase photosynthesis in rice, whether from conventional breeding, biotechnology or both. *Plant Cell and Environment*, 37: 19-21.
- SPENCE, A.K., BODDU, J., WANG, D-F., JAMES, B., SWAMINATHAH, K., MOOSE, S.P., LONG, S.P. (2014). Transcriptional Responses Indicate Maintenance of Photosynthetic Proteins as Key to the Exceptional Chilling Tolerance of C4 Photosynthesis in *Miscanthus x giganteus*. *Journal of Experimental Botany* 65: 3737-3747.
- DREWRY, D.T., KUMAR P., LONG S.P. (2014). Simultaneous improvement in productivity, water use and albedo through crop structural modification. *Global Change Biology* 20: 1955-1967.
- WANG, Y., LONG, S.P. and ZHU, X.-G. (2014). Elements Required for an efficient NADP-ME type C4 photosynthesis. *Plant Physiology* 164: 2231-2246.
- MCGRATH, J.M., LONG, S.P. (2014). Can the cyanobacterial carbon-concentrating mechanism increase photosynthesis in crop species? A theoretical analysis. *Plant Physiology* 164: 2247-2261
- ORT, D.R., LONG, S.P. (2014). Limits on Yields in the Corn Belt. *Science* 344: 484-485.

- MING, R., VANBUREN, R., LONG, S.P., ORT, D.R., SPENCE, A.K. and 24 other authors (2013). Genome of the long-living sacred lotus (*Nelumbo nucifera* Gaertn.). *Genome Biology*, 14, no.5.
- DUVAL B.D., ANDERSON-TEIXEIRA K.J., DAVIS S.C., KEOGH C., LONG S.P., PARTON, W.J., DELUCIA E.H. (2013). Predicting Greenhouse Gas Emissions and Soil Carbon from Changing Pasture to an Energy Crop. *PLoS ONE* 8.
- ZHU X., WANG X., ORT D. & LONG S.P. (2013). e-Photosynthesis: a comprehensive dynamic mechanistic model of C3 photosynthesis: from light capture to sucrose synthesis. *Plant, Cell & Environment* 36, 1711–1727.
- LONG S.P., SPENCE A.K. (2013). Toward Cool C4 Crops. *Annual Reviews of Plant Biology*, 64 701-722.
- DE SOUZA A.P., ARUNDALE R.A., DOHLEMAN F.G., LONG S.P., BUCKERIDGE M.S. (2013). Will the exceptional productivity of *Miscanthus x giganteus* increase further under rising atmospheric CO<sub>2</sub>? *Agricultural and Forest Meteorology*, 171, 82-92.
- SOUSSANA J.F., FERERES E., LONG S.P., MOHREN F., PANDYA-LORCH R., PELTONEN-SAINIO P., PORTER J.R., ROSSWALL T., VON BRAUN J. (2012). A European science plan to sustainably increase food security under climate change. *Global Change Biology*, 18, 3269-3271.
- ANDERSON-TEIXEIRA K.J., DUVAL B.D., LONG S.P., DELUCIA E.H. (2012). Biofuels on the landscape: Is “land sharing” preferable to “land sparing”? *Ecological Applications*, 22, 2035-2048.
- LONG S.P. (2012). Mechanisms of plant response to global atmospheric change. *Plant Cell and Environment* 35, 1705-06
- MIGUEZ F.E., MAUGHAN M., BOLLERO G.A., LONG S.P. (2012). Modeling spatial and dynamic variation in growth, yield, and yield stability of the bioenergy crops *Miscanthus x giganteus* and *Panicum virgatum* across the conterminous United States. *Global Change Biology Bioenergy*, 4, 509-520.
- LONG S.P. (2012). Food security – greater than anticipated impacts of near-term global atmospheric change on rice and wheat. *Global Change Biology*, 18, 1489-1490.
- DOHLEMAN F.G., HEATON E.A., ARUNDALE R.A., LONG S.P. (2012). Seasonal dynamics of above- and below-ground biomass and nitrogen partitioning in *Miscanthus* \**giganteus* and *Panicum virgatum* across three growing seasons. *Global Change Biology Bioenergy*, 4, 534-544.
- DAVIS S.C., DIETZE M., DELUCIA E., FIELD C., HAMBURG S.P., LOARIE S., PARTON W., POTTS M., RAMAGE B., WANG D., YOUNGS H., LONG S.P. (2012). Harvesting carbon from eastern US forests: opportunities and impacts of an expanding bioenergy industry. *Forests*, 3, 370-397.
- AINSWORTH E. A., YENDREK C. R., SKONECZKA J. A., LONG S. P. (2012). Accelerating yield potential in soybean: potential targets for biotechnological improvement. *Plant Cell and Environment*, 35, 38-52.
- ROSENTHAL D. M., LOCKE A. M., KHOZAEI M., RAINES C. A., LONG S. P., ORT D. R. (2011). Over-expressing the C3 photosynthesis cycle enzyme Sedoheptulose-1-7 Bisphosphatase improves photosynthetic carbon gain and yield under fully open air CO<sub>2</sub> fumigation (FACE). *BMC Plant Biology*, 11. 1-12.
- DAVIS S. C., DOHLEMAN F. G., LONG S. P. (2011). The global potential for Agave as a biofuel feedstock. *Global Change Biology Bioenergy*, 3, 68-78

DAVIS S.C., GRIFFITHS H., HOLTUM J., SAAVEDRA A.L., LONG S.P. (2011). The Evaluation of Feedstocks in GCBB Continues with a Special Issue on Agave for Bioenergy. *Global Change Biology Bioenergy*, 3, 1-3.

SOMERVILLE C., YOUNGS H., TAYLOR C., DAVIS S.C., LONG S.P. (2010). Feedstocks for Lignocellulosic Biofuels. *Science* 329, 790-792.

ZHU X.G., LONG S.P., ORT D.R. (2010). Improving Photosynthetic Efficiency for Greater Yield. *Annual Review of Plant Biology* 61, 235-261.

HEATON E.A., DOHLEMAN F.G., MIGUEZ F.A., JUVIK J.A., LOZOVAYA V., WIDHOLM, J., ZABOTINA O.A., MCISAAC G.F., DAVID M.B., VOIGT T.B., BOERSMA N.N., LONG S.P. (2010). Miscanthus: A Promising Biomass Crop. *Advances in Botanical Research*, 56, 75-137.

DREWRY D.T., KUMAR P., LONG S.P., BERNACCHI C., LIANG X.Z., SIVAPALAN M. (2010). Ecohydrological responses of dense canopies to environmental variability: 2. Role of an acclimation under elevated CO<sub>2</sub>. *Journal of Geophysical Research-Biogeosciences*, 115, G04023, 1-22.

DREWRY D.T., KUMAR P., LONG S.P., BERNACCHI C., LIANG X.Z., SIVAPALAN M. (2010). Ecohydrological responses of dense canopies to environmental variability: 1. Interplay between vertical structure and photosynthetic pathway. *Journal of Geophysical Research-Biogeosciences*, 115, G04022, 1-25.

MIGUEZ F.E., ZHU X.G., HUMPHRIES S., BOLLERO G.A., LONG S.P. (2009). A semimechanistic model predicting the growth and production of the bioenergy crop *Miscanthus x giganteus*: description, parameterization and validation. *Global Change Biology Bioenergy* 1, 282-296.

LONG S.P., ORT D.R. (2010). More than taking the heat: crops and global change. *Current Opinion in Plant Biology* 13, 241-248.

CALFAPIETRA C., AINSWORTH E.A., BEIER C., DE ANGELIS P., ELLSWORTH D.S., GODBOLD D.L., HENDREY G.R., HICKLER T., HOOSBEEK M.R., KARNOSKY D.F., KING J., KORNER C., LEAKEY A.D.B., LEWIN K.F., LIBERLOO M., LONG S.P., LUKAC M., MATYSSEK R., MIGLIETTA F., NAGY J., NORBY R.J., OREN R., PERCY K.E., ROGERS A., MUGNOZZA G.S., STITT M., TAYLOR G., CEULEMANS R. (2010). Challenges in elevated CO<sub>2</sub> experiments on forests. *Trends in Plant Science* 15, 5-10.

HEATON E.A., DOHLEMAN F.G., LONG S.P. (2009). Seasonal nitrogen dynamics of *Miscanthus x giganteus* and *Panicum virgatum*. *Global Change Biology Bioenergy* 1, 297-307.

DOHLEMAN F.G., HEATON E.A., LEAKEY A.D.B., LONG S.P. (2009). Does greater leaf-level photosynthesis explain the larger solar energy conversion efficiency of *Miscanthus* relative to switchgrass? *Plant Cell and Environment*, 32, 1525-1537.

\*DOHLEMAN F.G., LONG S.P., (2009). More productive than maize in the Midwest. How does *Miscanthus* do it? *Plant Physiology*, 150, 2104–2115.

LEAKEY A.D.B., AINSWORTH E.A., BERNACCHI C.J., ROGERS A., LONG S.P., AND ORT D.R. (2009). Elevated CO<sub>2</sub> effects on plant carbon, nitrogen, and water relations: six important lessons from FACE. 2009. *Journal of Experimental Botany* 60, 2859-2876.



- MIGUEZ F. E., ZHU X.G., HUMPHRIES S., BOLLERO G.A., LONG S.P. (2009). A semimechanistic model predicting the growth and production of the bioenergy crop *Miscanthus x giganteus*: description, parameterization and validation. *Global Change Biology Bioenergy*, 1, 282-296.
- CASTRO J.C., DOHLEMAN F.G., BERNACCHI C.J., LONG S.P. (2009). Elevated CO<sub>2</sub> significantly delays reproductive development of soybean under Free-Air Concentration Enrichment (FACE). *Journal of Experimental Botany* 60, 2945-2951.
- WITTIG V.E., AINSWORTH E.A., NAIDU S.L., KARNOSKY D.F., LONG S.P. (2009). Quantifying the impact of current and future tropospheric ozone on tree biomass, growth, physiology and biochemistry: a quantitative meta-analysis. *Global Change Biology* 15, 396-424.
- CHEN C.P., FRANK T.D., LONG S.P. (2009). Is a short, sharp shock equivalent to long-term punishment? Contrasting the spatial pattern of acute and chronic ozone damage to soybean leaves via chlorophyll fluorescence imaging. *Plant Cell and Environment* 32, 327-335.
- CHEN C.P., ZHU X.G., LONG S.P. (2008). The effect of leaf-level spatial variability in photosynthetic capacity on biochemical parameter estimates using the Farquhar model: A theoretical analysis. *Plant Physiology* 148, 1139-1147.
- AINSWORTH E.A., BEIER C., CALFAPIETRA C., CEULEMANS R., DURAND-TARDIF M., FARQUHAR G.D., GODBOLD D.L., HENDREY G.R., HICKLER T., KADUK J., KARNOSKY D.F., KIMBALL B.A., KOERNER C., KOORNNEEF M., LAFARGE T., LEAKEY A.D.B., LEWIN K.F., LONG S.P., MANDERSCHIED R., MCNEIL D.L., MIES T.A., MIGLIETTA F., MORGAN J.A., NAGY J., NORBY R.J., NORTON R.M., PERCY K.E., ROGERS A., SOUSSANA J.F., STITT M., WEIGEL H.J., WHITE J.W. (2008). Next generation of elevated [CO<sub>2</sub>] experiments with crops: a critical investment for feeding the future world. *Plant Cell and Environment* 31, 1317-1324
- WANG D., PORTIS A.R., MOOSE S.P., LONG S.P. (2008). Cool C<sub>4</sub> Photosynthesis – Pyruvate Pi Dikinase Expression and Activity Corresponds to The Exceptional Cold Tolerance of Carbon Assimilation in *Miscanthus x giganteus*. *Plant Physiology* 148, 557-567.
- MIGUEZ F.E., VILLAMIL M.B., LONG S.P., BOLLERO G.A. (2008). Meta-analysis of the effects of management factors on *Miscanthus x giganteus* growth and biomass production. *Agricultural and Forest Meteorology* 148: 1280-1292
- HEATON E.A., DOHLEMAN F.G., LONG S.P. (2008). Meeting U.S. Biofuel goals with less land: the potential of *Miscanthus*. *Global Change Biology* 14, 2000–2014.
- HEATON E.A., FLAVELL R.B., MASCIA P.N., THOMAS S.R., DOHLEMAN F.G., LONG S.P. (2008). Herbaceous Energy Crop Development: Recent Progress and Future Prospects. *Current Opinion in Biotechnology* 19, 202-209
- AINSWORTH E.A., LEAKEY A.D.B., ORT D.R., LONG S.P. (2008). FACE-ing the facts: Inconsistencies and interdependence among field, chamber and modelling studies of elevated [CO<sub>2</sub>] impacts on crop yield and food supply. *New Phytologist* 179, 5–9
- ZHU X.-G., LONG S.P., ORT D.R. (2008). What is the maximum efficiency with which photosynthesis can convert solar energy into biomass? *Current Opinion in Biotechnology* 19, 153–159.

- \*WANG D., NAIDU S.L., PORTIS A.R., MOOSE S.P., LONG S.P. (2008). Can the cold tolerance of C4 photosynthesis in *Miscanthus x giganteus* relative to *Zea mays* be explained by differences in activities and thermal properties of Rubisco? *Journal of Experimental Botany*, 59, 1779–1787.
- DERMODY O., LONG S.P., MCCONNAUGHAY K., DELUCIA E.H. (2008). How do elevated CO<sub>2</sub> and O<sub>3</sub> affect the interception and utilization of radiation by a soybean canopy? *Global Change Biology* 14, 556-564.
- TAYLOR G., TALLIS M.J., GIARDINA C.P., PERCY K.E., MIGLIETTA F., GUPTA P.S., GIOLI B., CALFAPIETRA C., GIELEN B., KUBISKE M.E., SCARASCIA-MUGNOZZA G.E., KETS K., LONG S.P., KARNOSKY D.F. (2008). Future atmospheric CO<sub>2</sub> leads to delayed autumnal senescence. *Global Change Biology* 14, 264-275.
- \*ZHU, X.-G., DE STURLER, E., LONG, S.P. (2007). Optimizing the Distribution of Resources between Enzymes of Carbon Metabolism Can Dramatically Increase Photosynthetic Rate: A Numerical Simulation Using an Evolutionary Algorithm. *Plant Physiology*, 145, 513-526.
- WITTIG, V.E., AINSWORTH, E.A., LONG, S.P. (2007). To what extent do current and projected increases in surface ozone affect photosynthesis and stomatal conductance of trees? A meta-analytic review of the last 3 decades of experiments. *Plant, Cell and Environment*, 30, 1150-1162.
- LONG, S.P., AINSWORTH, E.A., LEAKEY, A.D.B., ORT, D.R., NOSBERGER, J. & SCHIMMEL, D. (2007). Crop models, CO<sub>2</sub>, and climate change. *Response. Science*, 315, 460-460.
- BERNACCHI, C.J., LEAKEY, A.D.B., QUARLES, D.R., LONG, S.P. & ORT, D.R. (2007). Decreases in Stomatal Conductance of Soybean under Open-Air Elevation of [CO<sub>2</sub>] Are Closely Coupled with Decreases in Ecosystem Evapotranspiration. *Plant Physiology*, 143, 134–144.
- \*LONG, S.P., AINSWORTH, E.A., LEAKEY, A.D.B., NOSBERGER, J. & ORT, D.R. (2006). Food for Thought. Lower Than Expected Crop Yield Stimulation With Rising Carbon Dioxide Concentrations. *Science*, 312, 1918-1921.
- BERNACCHI, C.J., LEAKEY, A.D.B., HEADY, L.E., MORGAN, P.B., DOHLEMAN, F.G., MCGRATH, J.M., GILLESPIE, K.M., WITTIG, V.E., ROGERS, A., LONG, S.P. & ORT, D.R. (2006). Hourly and seasonal variation in photosynthesis and stomatal conductance of soybean grown at future CO<sub>2</sub> and ozone concentrations for 3 years under fully open-air field conditions. *Plant, Cell and Environment*, 29, 2077-2090.
- SCHROEDER, J.B., GRAY, M.E., RATCLIFFE, S.T., ESTES, R.E. & LONG, S.P. (2006). Effects of elevated CO<sub>2</sub> and O<sub>3</sub> on a variant of the western corn rootworm (Coleoptera: Chrysomelidae). *Environmental Entomology*, 35, 637-644.
- LEAKEY, A.D.B., BERNACCHI, C.J., ORT, D.R. & LONG, S.P. (2006). Long-term growth of soybean at elevated [CO<sub>2</sub>] does not cause acclimation of stomatal conductance under fully open-air conditions. *Plant, Cell and Environment*, 29, 1794-1800.
- ROGERS, A., GIBON, Y., STITT, M., MORGAN, P.B., BERNACCHI, C.J., ORT, D.R. & LONG, S.P. (2006). Increased C availability at elevated carbon dioxide concentration improves N assimilation in a legume. *Plant, Cell and Environment*, 29, 1651-1658.

DAVEY, P.A., OLCER, H., ZAKHLENIUK, O., BERNACCHI, C.J., CALFAPIETRA, C., LONG, S.P. & RAINES, C.A. (2006). Can fast-growing plantation trees escape biochemical down-regulation of photosynthesis when grown throughout their complete production cycle in the open air under elevated carbon dioxide? *Plant, Cell and Environment*, 29, 1235-1244.

WALL, G.W., GARCIA, R.L., KIMBALL, B.A., HUNSAKER, D.J., PINTER, P.J., LONG, S.P., OSBORNE, C.P., HENDRIX, D.L., WECHSUNG, F., WECHSUNG, G., LEAVITT, S.W., LAMORTE, R.L. (2006). Interactive effects of elevated carbon dioxide and drought on wheat. *Agronomy Journal*, 98, 354-381.

\*MORGAN, P.B., MIES, T.A., BOLLERO, G.A., NELSON, R.L. & LONG, S.P. (2006). Season-long elevation of ozone concentration to projected 2050 levels under fully open-air conditions substantially decreases the growth and production of soybean. *New Phytologist*, 170, 333-343.

LONG, S.P., ZHU, X.G., NAIDU, S.L. & ORT, D.R. (2006). Can improvement in photosynthesis increase crop yields? *Plant Cell and Environment*, 29, 315-330.

FARAGE, P.K., BLOWERS, D., LONG, S.P. & BAKER N.R. (2006). Low growth temperatures modify the efficiency of light use by photosystem II for CO<sub>2</sub> assimilation in leaves of two chilling-tolerant C-4 species, *Cyperus longus* L. and *Miscanthus x giganteus*. *Plant, Cell and Environment*, 29, 720-728.

LEAKEY, A.D.B., URIBELARREA, M., AINSWORTH, E.A., NAIDU, S.L., ROGERS, A., ORT, D.R. & LONG, S.P. (2006). Photosynthesis, productivity, and yield of maize are not affected by open-air elevation of CO<sub>2</sub> concentration in the absence of drought. *Plant Physiology*, 140, 779-790.

DERMODY, O., LONG, S.P. & DELUCIA, E.H. (2006). How does elevated CO<sub>2</sub> or ozone affect the leaf-area index of soybean when applied independently? *New Phytologist*, 169, 145-155.

ZHU, X.G., GOVINDJEE, BAKER, N.R., DESTURLER, E., ORT, D.R. & LONG, S.P. (2005). Chlorophyll a fluorescence induction kinetics in leaves predicted from a model describing each discrete step of excitation energy and electron transfer associated with photosystem II. *Planta*, 223, 114-133.

WITTIG, V.E., BERNACCHI, C.J., ZHU, X.G., CALFAPIETRA, C., CEULEMANS, R., DEANGELIS, P., GIELEN, B., MIGLIETTA, F., MORGAN, P.B. & LONG, S.P. (2005). Gross primary production is stimulated for three *Populus* species grown under free-air CO<sub>2</sub> enrichment from planting through canopy closure. *Global Change Biology*, 11, 644-656.

PIMENTEL, C., DAVEY, P.A., JUVIK, J.A. & LONG, S.P. (2005). Gene loci in maize influencing susceptibility to chilling dependent photoinhibition of photosynthesis. *Photosynthesis Research*, 85, 319-326.

MORGAN, P.B., BOLLERO, G.A., NELSON, R.L., DOHLEMAN, F.G. & LONG, S.P. (2005). Smaller than predicted increase in aboveground net primary production and yield of field-grown soybean under fully open-air [CO<sub>2</sub>] elevation. *Global Change Biology*, 11, 1856-1865.

LONG, S.P., AINSWORTH, E.A., LEAKEY, A.D.B. & MORGAN, P.B. (2005). Global food insecurity. Treatment of major food crops with elevated carbon dioxide or ozone under large-scale fully open-air conditions suggests recent models may have overestimated future yields. *Philosophical Transactions of The Royal Society B-Biological Sciences*, 360, 2011-2020.

GIELEN, B., CALFAPIETRA, C., LUKAC, M., WITTIG, V.E., DE ANGELIS, P., JANSSENS, I.A., MOSCATELLI, M.C., GREGO, S., COTRUFO, M.F., GODBOLD, D.L., HOOSBEEK, M.R., LONG, S.P., MIGLIETTA, F., POLLE, A., BERNACCHI, C.J., DAVEY, P.A., CEULEMANS, R. & SCARASCIA-MUGNOZZA, G.E. (2005). Net carbon storage in a poplar plantation (POPFACE) after three years of free-air CO<sub>2</sub> enrichment. *Tree Physiology*, 25, 1399-1408.

BERNACCHI, C.J., MORGAN, P.B., ORT, D.R. & LONG, S.P. (2005). The growth of soybean under free air [CO<sub>2</sub>] enrichment (FACE) stimulates photosynthesis while decreasing in vivo Rubisco capacity. *Planta*, 220, 434-446.

\*AINSWORTH, E.A. & LONG, S.P. (2005). Tansley Review: What have we learned from 15 years of free-air CO<sub>2</sub> enrichment (FACE)? A meta-analytic review of the responses of photosynthesis, canopy. *New Phytologist*, 165, 351-371.

NAIDU, S.L. & LONG, S.P. (2004). Potential mechanisms of low-temperature tolerance of C<sub>4</sub> photosynthesis in *Miscanthus x giganteus*: an in vivo analysis. *Planta*, 220, 145-155.

MORGAN, P.B., BERNACCHI, C.J., ORT, D.R. & LONG, S.P. (2004). An in vivo analysis of the effect of season-long open-air elevation of ozone to anticipated 2050 levels on photosynthesis in soybean. *Plant Physiology*, 135, 2348-2357.

LONG, S.P., AINSWORTH, E.A., ROGERS, A., ORT, D.R. (2004). Rising Atmospheric Carbon Dioxide: Plants FACE the future. *Annual Reviews of Plant Biology*, 55, 591-628.

ZHU, X.G., ORT, D.R., WHITMARSH, J. & LONG, S.P. (2004). The slow reversibility of photosystem II thermal energy dissipation on transfer from high to low light may cause large losses in carbon gain by crop canopies: a theoretical analysis. *Journal of Experimental Botany*, 55, 1167-1175.

MIYAZAKI, S., FREDRICKSEN, M., HOLLIS, K.C., POROYKO, V., SHEPLEY, D., GALBRAITH, D.W., LONG, S.P. & BOHNERT, H.J. (2004). Transcript expression profiles of *Arabidopsis thaliana* grown under controlled conditions and open-air elevated concentrations of CO<sub>2</sub> and of O<sub>3</sub>. *Field Crops Research*, 90, 47-59.

ZHU, X.G., PORTIS, A.R. & LONG, S.P. (2004). Would transformation of C-3 crop plants with foreign Rubisco increase productivity? A computational analysis extrapolating from kinetic properties to canopy photosynthesis. *Plant, Cell and Environment*, 27, 155-165.

LEAKEY, A.D.B., BERNACCHI, C.J., DOHLEMAN, F.G., ORT, D.R. & LONG, S.P. (2004). Will photosynthesis of maize (*Zea mays*) in the US Corn Belt increase in future CO<sub>2</sub> rich atmospheres? An analysis of diurnal courses of CO<sub>2</sub> uptake under free-air concentration enrichment (FACE). *Global Change Biology*, 10, 951-962.

ROGERS, A., ALLEN, D.J., DAVEY, P.A., MORGAN, P.B., AINSWORTH, E.A., BERNACCHI, C.J., CORNIC, G., DERMODY, O., DOHLEMAN, F.G., HEATON, E.A., DELUCIA, E.H., ORT, D.R., LONG, S.P. (2004). Leaf photosynthesis and carbohydrate dynamics of soybeans grown throughout their life-cycle under Free-Air Carbon dioxide Enrichment. *Plant, Cell and Environment*, 27, 449-458.

HEATON, E., VOIGT T., LONG, S.P. (2004). A quantitative review comparing the yields of two candidate C<sub>4</sub> perennial biomass crops in relation to nitrogen, temperature and water. *Biomass and Bioenergy*, 27, 21-30.

AINSWORTH, E.A., ROGERS, A., NELSON, R. & LONG, S.P. (2004) Testing the "source-sink" hypothesis of down-regulation of photosynthesis in elevated CO<sub>2</sub> in the field with single gene substitutions in *Glycine max*.

HEATON, E.A., CLIFTON-BROWN, J., VOIGT, T., JONES, M.B., LONG, S.P. (2004). *Miscanthus* for Renewable Energy Generation: European Union Experience and Projections for Illinois. *Mitigation and Adaptation strategies for Global Change*, 9, 433-451.

DAVEY, P.A., HUNT, S., HYMUS, G.J., DELUCIA, E.H., DRAKE, B.G., KARNOSKY, D.F. & LONG, S.P. (2004). Respiratory oxygen uptake is not decreased by an instantaneous elevation of CO<sub>2</sub>, but is increased with long-term growth in the field at elevated CO<sub>2</sub>. *Plant Physiology*, 134, 520-527.

AINSWORTH, E.A., ROGERS, A., BLUM, H., NOSBERGER, J. & LONG, S.P. (2003). Variation in acclimation of photosynthesis in *Trifolium repens* after eight years of exposure to Free Air CO<sub>2</sub> Enrichment (FACE). *Journal of Experimental Botany*, 54, 2769-2774.

LONG, S.P., BERNACCHI, C.J. (2003). Gas exchange measurements, what can they tell us about the underlying limitations to photosynthesis? Procedures and sources of error. *Journal of Experimental Botany*, 54, 2393-2401.

BERNACCHI, C.J., PIMENTEL, C. & LONG, S.P. (2003). In Vivo Temperature Response Functions of Parameters Required to Model RuBP-Limited Photosynthesis. *Plant, Cell & Environment*, 26, 1419-1430.

BERNACCHI, C.J., CALFAPIERRA, C., DAVEY, P.A., WITTIG, V.E., SCARASCIA-MUGNOZZA, G.E., RAINES, C.A., LONG, S.P. (2003). Photosynthesis and stomatal conductance responses of poplars to free-air CO<sub>2</sub> enrichment (PopFACE) during the first growth cycle and immediately following coppice. *New Phytologist*, 159, 609-621.

MORGAN, P.B., AINSWORTH, E.A. & LONG, S.P. (2003). How does elevated ozone concentration impact soybean? A meta-analysis of the responses of photosynthesis, leaf carbohydrates, biomass and yield. *Plant, Cell & Environment*, 26, 1317-1328.

NAIDU, S.L., MOOSE, S.P., AL-SHOABI, A.K., RAINES, C.A., LONG, S.P. (2003). Cold-tolerance of C<sub>4</sub> photosynthesis in *Miscanthus x giganteus*—effects of cold on photosynthetic proteins. *Plant Physiology*, 132, 1688-1697.

AINSWORTH, E.A., DAVEY, P.A., HYMUS, G.J., OSBORNE, C.P., ROGERS, A., BLUM, H., NÖSBERGER, J. & LONG, S.P. (2003). Is stimulation of leaf photosynthesis by elevated carbon dioxide concentration maintained in the long term? A test with *Lolium perenne* grown for ten years at two nitrogen fertilization levels under Free Air CO<sub>2</sub> Enrichment (FACE). *Plant, Cell & Environment*, 26, 705-714.

MASON, C.F., UNDERWOOD, G.J.C., BAKER, N.R., DAVEY, P.A., DAVIDSON, I., HANLON, G., LONG, S.P., OXBOROUGH, K., PATERSON, D.M. & WATSON, A. (2003). The role of herbicides in the erosion of salt marshes in eastern England. *Environmental Pollution*, 122, 41-49.

AINSWORTH, E.A., TRANEL, P.J., DRAKE, B.G. & LONG, S.P. (2003). The clonal structure of *Quercus geminata* revealed by conserved microsatellite loci. *Molecular Ecology*, 12, 527-532.

\*BERNACCHI, C.J., PORTIS, A.R., NAKANO, H., VON CAEMMERER, S. & LONG, S.P. (2002). Temperature response of mesophyll conductance. Implications for the determination of Rubisco enzyme kinetics and for limitations to photosynthesis in vivo. *Plant Physiology*, 130, 1992-1998.

AINSWORTH, E.A., DAVEY, P.A., HYMUS, G.J., DRAKE, B.G. & LONG, S.P. (2002). Long-term response of photosynthesis to elevated carbon dioxide in a Florida scrub-oak ecosystem. *Ecological Applications*, 12, 1267-1275.

- AINSWORTH, E.A., DAVEY, P.A., BERNACCHI, C.J., DERMODY, O.C., HEATON, E.A., MOORE, D.J., MORGAN, P.B., NAIDU, S.L., RA, H.S.Y., ZHU, X.G., LONG, S.P. (2002). A meta-analysis of elevated [CO<sub>2</sub>] effects on soybean (*Glycine max*) physiology, growth and yield. *Global Change Biology*, 8, 695-709.
- MCKEE, I.F. & LONG, S.P. (2001). Plant growth regulators control ozone damage to wheat yield. *New Phytologist*, 152, 41-51.
- HYMUS, G.J., DIJKSTRA, P., BAKER, N.R., DRAKE, B.G. & LONG, S.P. (2001). Will rising CO<sub>2</sub> protect plants from the midday sun? A study of photoinhibition of *Quercus myrtifolia* in a scrub-oak community in two seasons. *Plant Cell and Environment*, 24, 1361-1368.
- HYMUS, G.J., BAKER, N.R. & LONG, S.P. (2001). Growth in elevated CO<sub>2</sub> can both increase and decrease photochemistry and photoinhibition of photosynthesis in a predictable manner. *Dactylis glomerata* grown in two levels of nitrogen nutrition. *Plant Physiology*, 127, 1204-1211.
- HARRISON, E.P., OLCER, H., LLOYD, J.C., LONG, S.P. & RAINES, C.A. (2001). Small decreases in SBPase cause a linear decline in the apparent RuBP regeneration rate, but do not affect Rubisco carboxylation capacity. *Journal of Experimental Botany*, 52, 1779-1784.
- GEIDER, R.J., DELUCIA, E.H., FALKOWSKI, P.G., FINZI, A.C., GRIME, J.P., GRACE, J., KANA, T.M., LA ROCHE, J., LONG, S.P., OSBORNE, B.A., PRENTICE, C.J., WOODWARD, F.I. (2001). Primary productivity of planet earth: biological determinants and physical constraints in terrestrial and aquatic habitats. *Global Change Biology*, 7, 849-882.
- \*BERNACCHI, C.J., SINGSAAS, E.L., PIMENTEL, C., PORTIS, A.R. JR & LONG, S.P. (2001). Improved temperature response functions for models of Rubisco-limited photosynthesis. *Plant, Cell & Environment*, 24, 253-260.
- MORISON, J.I.L., PIEDADE, M.T.F., MULLER, E., LONG, S.P., JUNK, W.J. & JONES, M.B. (2000). Very high productivity of the C-4 aquatic grass *Echinochloa polystachya* in the Amazon floodplain confirmed by net ecosystem CO<sub>2</sub> flux measurements. *Oecologia*, 125, 400-411.
- MCKEE, I.F., MULHOLLAND, B.J., CRAIGON, J., BLACK, C.R. & LONG, S.P. (2000). Elevated concentrations of atmospheric CO<sub>2</sub> protect against and compensate for O<sub>3</sub> damage to photosynthetic tissues of field-grown wheat. *New Phytologist*, 146, 427-435.
- MARTIN, M.J., STIRLING, C.M., HUMPHRIES, S.W. & LONG, S.P. (2000). A process-based model to predict the effects of climatic change on leaf isoprene emission rates. *Ecological Modelling*, 131, 161-174.
- MARTIN, M.J., FARAGE, P.K., HUMPHRIES, S.W. & LONG, S.P. (2000). Can the stomatal changes caused by acute ozone exposure be predicted by changes occurring in the mesophyll? A simplification for models of vegetation response to the global increase in tropospheric elevated ozone episodes. *Australian Journal of Plant Physiology*, 27, 211-219.
- ISOPP, H., FREHNER, M., LONG, S.P. & NOSBERGER, J. (2000). Sucrose-phosphate synthase responds differently to source-sink relations and to photosynthetic rates: *Lolium perenne* L. growing at elevated p(CO<sub>2</sub>) in the field. *Plant Cell and Environment*, 23, 597-607.
- MCLEOD, A.R. & LONG, S.P. (1999). Free-air carbon dioxide enrichment (FACE) in global change research: A review. *Advances in Ecological Research*, 28, 1-55.

- GROSSMAN-CLARKE, S., KIMBALL, B.A., HUNSAKER, D.J., LONG, S.P., GARCIA, R.L., KARTSCHALL, T., WALL, G.W., PRINTER, P.J., WECHSUNG, F., LAMORTE, R.L. (1999). Effects of elevated atmospheric CO<sub>2</sub> on canopy transpiration in senescent spring wheat. *Agricultural and Forest Meteorology*, 93, 95-109.
- DAVEY, P. A., PARSONS, A.J., ATKINSON, L., WADGE, K., LONG, S.P. (1999). Does photosynthetic acclimation to elevated CO<sub>2</sub> increase photosynthetic nitrogen-use efficiency? A study of three native UK grassland species in open-top chambers. *Functional Ecology*, 13, 21-28.
- FARAGE, P.K. & LONG, S.P. (1999). The effects of ozone fumigation during leaf development on photosynthesis in wheat and pea: An in vivo analysis. *Photosynthesis Research*, 59, 1-7.
- BEALE, C.V., MORISON, J.I.L., LONG, S.P. (1999). Water use efficiency of C<sub>4</sub> perennial grasses in a temperate climate. *Agricultural and Forest Meteorology*, 96, 103-115.
- HYMUS, G.J., ELLSWORTH, D.S., BAKER, N.R., LONG, S.P. (1999). Does free-air carbon dioxide enrichment affect photochemical energy use by evergreen trees in different seasons? A chlorophyll fluorescence study of mature loblolly pine. *Plant Physiology*, 120, 1183-1191.
- GARCIA, R.L., LONG, S.P., WALL, G.W., OSBORNE, C.P., KIMBALL, B.A., NIE, G.Y., PINTER, P.J. & LAMORTE, R.L. (1998). Seasonal and diurnal variation in photosynthesis and conductance of spring wheat leaves: Response to free-air atmospheric CO<sub>2</sub> enrichment. *Plant, Cell & Environment*, 21, 659-670.
- ROGERS, A., FISCHER, B.U., BRYANT, J., FREHNER, M., BLUM, H., RAINES, C.A. & LONG, S.P. (1998). Acclimation of photosynthesis to elevated CO<sub>2</sub> under low N nutrition is effected by the capacity for assimilate utilisation. Perennial ryegrass under Free-Air CO<sub>2</sub> Enrichment (FACE). *Plant Physiology*, 118 683-692.
- FARAGE, P.K., MCKEE, I.F., LONG, S.P. (1998). Acclimation of photosynthesis to elevated CO<sub>2</sub> in wheat: Dependence on nitrogen. *Plant Physiology*, 118 573-581.
- OSBORNE, C.P., LAROCHE, J., GARCIA, R.L., KIMBALL, B.A., WALL, G.W., PINTER, P.J., LAMORTE, R.L., HENDREY, G.R. & LONG, S.P. (1998). Does leaf position within a canopy affect acclimation of photosynthesis to elevated CO<sub>2</sub>. *Plant Physiology*, 117, 1037-1045.
- HENDREY, G.R., LONG, S.P., MCKEE, I.F. & BAKER, N.R. (1997). Can photosynthesis respond to short-term fluctuations in atmospheric carbon dioxide? *Photosynthesis Research*, 51, 179-184.
- HULL, M.R., LONG, S.P., JAHNKE, L.S. (1997). Instantaneous and developmental effects of low temperature on the catalytic properties of anti-oxidant enzymes in two *Zea* species. *Australian Journal of Plant Physiology*, 24, 337-343.
- STIRLING, C.M., DAVEY, P.A., WILLIAMS, T.G. & LONG, S.P. (1997). Acclimation of photosynthesis to elevated CO<sub>2</sub> and temperature in five British native species of contrasting functional type. *Global Change Biology*, 3, 237-246.
- OSBORNE, C.P., DRAKE, B.G., LAROCHE, J. & LONG, S.P. (1997). Does long-term elevation of CO<sub>2</sub> concentration increase photosynthesis in forest floor vegetation? *Plant Physiology*, 114, 337-344.
- PIEDADE, M.T., JUNK, W.J. & LONG, S.P. (1997). Nutrient dynamics of the highly productive macrophyte *Echinochloa polystachya* on the Amazon floodplain. *Functional Ecology*, 11, 60-65.

- BEALE, C.V. & LONG, S.P. (1997). Seasonal dynamics of nutrient accumulation and partitioning in the perennial C<sub>4</sub>-grasses *Miscanthus x giganteus* and *Spartina cynosuroides*. *Biomass and Bioenergy*, 12, 419-428.
- BEALE, C.V. & LONG, S.P. (1997). The effects of nitrogen and irrigation on the productivity of the C<sub>4</sub> grasses *Miscanthus x giganteus* and *Spartina cynosuroides*. *Aspects of Applied Biology*, 49, 225-230.
- DRAKE, B.G., GONZALEZ-MELER, M. & LONG, S.P. (1997) More efficient plants: A consequence of rising atmospheric CO<sub>2</sub>? *Annual Reviews of Plant Physiology and Plant Molecular Biology*, 48, 607-637.
- MCKEE, I.F., BULLIMORE, J.F. & LONG, S.P. (1997). Will elevated CO<sub>2</sub> concentrations protect the yield of wheat from O<sub>3</sub> damage. *Plant, Cell & Environment*, 20, 77-84.
- NUGAWELA, A., LONG, S.P. & ALUTHHEWAGE, R.K. (1996) Genotypic variation in non-steady state photosynthetic carbon dioxide assimilation in *Hevea brasiliensis*. *Journal of Natural Rubber Research*, 10, 266-275.
- LONG, S.P., FARAGE, P.K. & GARCIA, R.L. (1996). Measurement of leaf and canopy photosynthetic CO<sub>2</sub> exchange in the field. *Journal of Experimental Botany*, 47, 1629-1642.
- BEALE, C.V., BINT, D.A. & LONG, S.P. (1996). Leaf photosynthesis in the C<sub>4</sub>-grass *Miscanthus x giganteus*, growing in the cool temperate climate of southern England. *Journal of Experimental Botany*, 47, 257-273.
- MCKEE, I.F., FARAGE, P.K. & LONG, S.P. (1995). The interactive effects of elevated CO<sub>2</sub> and O<sub>3</sub> concentration on photosynthesis in spring wheat. *Photosynthesis Research*, 45, 111-119.
- POTTER, L., BINGHAM, M.J., BAKER, M.G. & LONG, S.P. (1995). The potential of two perennial C<sub>4</sub> grasses and a perennial C<sub>4</sub> sedge as ligno-cellulosic fuel crops in N.W. Europe. Crop establishment and yields in E. England. *Annals of Botany*, 76, 513-520.
- \*BEALE, C.V. & LONG, S.P. (1995). Can perennial C<sub>4</sub> grasses attain high efficiencies of radiant energy conversion in cool climates? *Plant, Cell & Environment*, 18, 641-650.
- HUMPHRIES, S.A. & LONG, S.P. (1995). WIMOVAC: a software package for modelling the dynamics of plant leaf and canopy photosynthesis. *CABIOS*, 11, 361-371.
- FARAGE, P.K. & LONG, S.P. (1995). The effects of acute ozone exposure on photosynthesis in contrasting species: An in vivo analysis. *Photosynthesis Research*, 43, 11-18.
- \*NIE, G.-Y., HENDRIX, D. & WEBBER, A.N. & LONG, S.P. (1995). Free-air CO<sub>2</sub> enrichment effects on the expression of photosynthetic genes and accumulation of carbohydrate in Wheat. Does decreased expression of specific photosynthetic genes correspond to increased accumulation of soluble carbohydrates? *Plant Physiology*, 108, 975-983.
- NIE, G.-Y., LONG, S.P., GARCIA, R.L., KIMBALL, B.A., LaMORTE, R.L., PINTER, P.J., WALL, G.W., & WEBBER, A.N. (1995). Effects of free-air CO<sub>2</sub> enrichment on the development of the photosynthetic apparatus in wheat, as indicated by leaf proteins. *Plant, Cell & Environment*, 18, 855-864.
- STIRLING, C.M., AGUILERA, C., BAKER, N.R., LONG, S.P. (1994). Changes in the photosynthetic light response curve during leaf development of field grown maize with implications for modelling canopy photosynthesis. *Photosynthesis Research*, 42, 217-225.



WEBBER, A., NIE, G.-Y. & LONG, S.P. (1994). Effects of rising CO<sub>2</sub> concentration on expression of photosynthetic proteins. *Photosynthesis Research*, 39, 413-425.

PIEADADE, M.T., LONG, S.P. & JUNK, W.J. (1994). Leaf and canopy photosynthetic CO<sub>2</sub> uptake of a stand of *Echinochloa polystachya* on the Central Amazon floodplain. Are the high potential rates associated with the C<sub>4</sub> syndrome realized under the near-optimal conditions provided by this exceptional natural habitat? *Oecologia*, 97, 193-201.

\*LONG, S.P., HUMPHRIES, S. & FALKOWSKI, P.G. (1994). Photoinhibition of photosynthesis in nature. *Annual Reviews of Plant Physiology and Plant Molecular Biology*, 45, 633-662.

PÉREZ-LEROUX, H.A.J. & LONG, S.P. (1994). Growth analysis of contrasting *Zea mays* L. cultivars at different rates of nitrogen supply. *Annals of Botany*, 73, 503-515.

LONG, S.P., BAKER, N.R. & RAINES, C.A. (1993). Analysing the responses of photosynthetic CO<sub>2</sub> assimilation to long-term elevation of atmospheric CO<sub>2</sub> concentration. *Vegetatio*, 104, 33-45.

\*LONG, S.P., POSTL, W.F. & BOLHÁR-NORDENKAMPF, H.R. (1993). Quantum yields for CO<sub>2</sub> uptake in C<sub>3</sub> vascular plants of contrasting habitats and taxonomic groupings. *Planta*, 189, 219-226.

NIE, G.-Y., LONG, S.P. & BAKER, N.R. (1992). The effect of development at sub-optimal temperatures on photosynthetic capacity and susceptibility to photoinhibition of *Zea mays*. *Physiologia Plantarum*, 85, 554-560.

STIRLING, C.M., NIE, G.-Y., AGUILERA, C., NUGAWELA, A., LONG, S.P. & BAKER, N.R. (1991). Photosynthetic productivity of an immature maize crop: changes in quantum yield of CO<sub>2</sub> assimilation, conversion efficiency and thylakoid proteins. *Plant, Cell and Environment*, 14, 947-954.

SHEN, Y.-G., QIU, G.-X., XU, D.-Q., HUANG, Q.-M., YANG, D.-D., GAO, A.-X., LONG, S.P. & HALL, D.O. (1991). Studies on the Photosynthesis of Bamboo. *Chinese Journal of Botany*, 3, 116-121.

\*PIEADADE, M.T., JUNK, W.J. & LONG, S.P. (1991). The productivity of the C<sub>4</sub> grass *Echinochloa polystachya* in the Amazon floodplain. *Ecology*, 72, 1456-63.

LONG, S.P. & HUTCHIN, P.B. (1991). Primary production in grasslands and coniferous forests in relation to climate change: An overview. *Ecological Applications*, 1, 139-156.

\*LONG, S.P. & DRAKE, B.G. (1991). Effect of the long-term elevation of CO<sub>2</sub> concentration in the field on the quantum yield of photosynthesis of the C<sub>3</sub> sedge, *Scirpus olneyi*. *Plant Physiology*, 96, 221-226.

\*LONG, S.P. (1991). Modification of the response of photosynthetic productivity to rising temperature by atmospheric CO<sub>2</sub> concentrations. Has its importance been underestimated? *Opinion. Plant, Cell and Environment*, 14, 729-739

\*JAHNKE, L.S., HULL, M.R. & LONG, S.P. (1991). Chilling and oxygen metabolising enzymes in *Zea mays* and *Zea diploperennis*. *Plant, Cell and Environment*, 14, 97- 104.

GROOME, Q., BAKER, N.R. & LONG, S.P. (1991). Photoinhibition in holly (*Ilex aquifolium*) in the field in S. England. *Physiologia Plantarum*, 83, 585-590.

\*FARAGE, P.K., LONG, S.P., LECHNER, E.G. & BAKER, N.R. (1991). The sequence of change within the photosynthetic apparatus of wheat following short-term exposure to ozone. *Plant Physiology*, 95, 529-535.

- FARAGE, P.K. & LONG, S.P. (1991). The occurrence of photoinhibition in an over-wintering oil-seed rape crop (*Brassica napus*) and its correlation with changes in crop growth. *Planta*, 185, 279-285.
- BOLHAR-NORDENKAMPF, H.R., LONG, S.P. & LECHNER, E.G. (1989). Die Bestimmung der Photosynthesekapazität über die Chlorophyllfluoreszenz als Maß für die Streßbelastung von Bäumen. *Phyton*, 29, 119-135.
- IRELAND, C.R., LONG, S.P., BAKER, N.R. (1989). An integrated portable apparatus for the simultaneous field measurement of photosynthetic CO<sub>2</sub> and water vapour exchange, light absorption and chlorophyll fluorescence emission of attached leaves. *Plant Cell and Environment*, 12, 947-958.
- LONG, S.P., GARCIA-MOYA, E., IMBAMBA, S.K., KAMNALRUT, A. PIEDADE, M.T.F., SCURLOCK, J.M.O., SHEN, Y.K. AND HALL, D.O. (1989). Primary productivity of natural grass ecosystems of the tropics: A reappraisal. *Plant and Soil*, 115, 155-166.
- BOLHAR-NORDENKAMPF, H.R., LONG, S.P., BAKER, N.R., OQUIST, G., SCHREIBER, U. & LECHNER, E. (1989). Chlorophyll fluorescence as an early indicator of forest decline – an assessment of new instrumentation. *Functional Ecology*, 3, 497-514.
- BAKER, N.R., BRADBURY, M., FARAGE, P.K., IRELAND, C.R. & LONG, S.P. (1989). Measurements of quantum yield of carbon assimilation and chlorophyll fluorescence for assessment of photosynthetic performance of crop plants in the field. *Philosophical Transactions of the Royal Society B*, 323, 295-308.
- LONG, S.P., BOLHAR-NORDENKAMPF, H.R., CROFT, S., FARAGE, P.K., LECHNER, E. & NUGAWELA, A. (1989). Analysis of spatial variation in CO<sub>2</sub> uptake within the intact leaf and its significance in interpreting the effects of environmental stress on photosynthesis. *Philosophical Transactions of the Royal Society B*, 323, 385-395.
- PRICE, S. & LONG, S.P. (1989). An in vivo analysis of the effects of SO<sub>2</sub> on photosynthesis in *Zea mays* leaves. *Physiologia Plantarum*, 76 193-200.
- LONG, S.P., FARAGE, P.K., BOLHAR-NORDENKAMPF, H.R. & ROHROFER, R. (1989). Separating the contribution of the upper and lower mesophyll to photosynthesis *Zea mays* L. leaves. *Planta*, 177, 207-216.
- BOLHAR-NORDENKAMPF, H.R., LECHNER, E. & LONG, S.P. (1988). Bestimmung der Photosynthesekapazität über die Chlorophyllfluoreszenz. *Allgemeine Forstzeitschrift (München)*, 38, 1044-1045.
- BONGI, G., LONG, S.P. (1987). Light-dependent damage to photosynthesis in Olive leaves during chilling and high temperature stress. *Plant Cell and Environment*, 10, 241-249.
- DUNN, R., THOMAS, S.M., KEYS, A.J., LONG, S.P. (1987). A comparison of the growth of the C<sub>4</sub> grass *Spartina anglica* with the C<sub>3</sub> grass *Lolium perenne* at different temperatures. *Journal of Experimental Botany*, 38, 433-441.
- IRELAND, C.R., BAKER, N.R., LONG, S.P. (1986). Regulation of the Redox state of Photosystem II electron acceptors in vivo by CO<sub>2</sub> and O<sub>2</sub>. *Biophysica et Biochimica Acta*, 893, 434-443.
- JACKSON, D., LONG, S.P., MASON, C.F. (1986). Net primary production, decomposition and export of *Spartina anglica* on a Suffolk salt-marsh. *Journal of Ecology*, 74, 647-662.

- JACKSON, D., HARKNESS, D.D., MASON, C.F., LONG, S.P. (1986). *Spartina anglica* as a carbon source for salt-marsh invertebrates: a study using  $^{13}\text{C}$  values. *Oikos*, 46, 163-170.
- HARMSWORTH, G.C., LONG, S.P. (1986). An assessment of saltmarsh erosion in Essex, England with reference to the Dengie Peninsula. *Biological Conservation*, 35, 377-387.
- IRELAND, C.R., BAKER, N.R., LONG, S.P. (1985). The role of carbon dioxide and oxygen in determining chlorophyll fluorescence quenching during leaf development. *Planta*, 165, 477-485.
- JACKSON, D., MASON, C.F., LONG, S.P. (1985). Macro-invertebrate populations and production on a salt-marsh in east England dominated by *Spartina anglica*. *Oecologia*, 65, 406-411.
- BEADLE, C.L., LONG, S.P. (1985). Photosynthesis – is it limiting to biomass production? *Biomass*, 8, 19-168.
- IRELAND, C.R., LONG, S.P., BAKER, N.R. (1984). The relationship between  $\text{CO}_2$  fixation and chlorophyll a fluorescence during induction of photo synthesis in maize leaves at different temperatures and  $\text{CO}_2$  concentrations. *Planta*, 160, 550-558.
- BAKER, N.R., EAST, T.M., LONG, S.P. (1983). Chilling Damage to Photo synthesis in Young *Zea mays* II. Photochemical Function of Thylakoids In Vivo. *Journal of Experimental Botany*, 34, 189-197.
- LONG, S.P., EAST, T.M., BAKER, N.R. (1983). Chilling Damage to Photo synthesis in Young *Zea mays* I. Effects of light and temperature variation on photosynthetic  $\text{CO}_2$  assimilation. *Journal of Experimental Botany*, 34, 177-188
- \*LONG, S.P. (1983)  $\text{C}_4$  photosynthesis at low temperatures. *Plant, Cell and Environment*, 6, 345-363.
- HUSSEY, A., LONG, S.P. (1982). The Net Primary Production of Emergent Salt-marsh at Colne Point, Essex. I. Seasonal Changes in Plant Mass. *Journal of Ecology*, 70, 757-772.
- MIRANDA, V., BAKER, N.R., LONG, S.P. (1981). Limitations of in vivo photosynthesis in the different regions of the *Zea mays* leaf. *New Phytologist*, 89, 179-190.
- MIRANDA, V., BAKER, N.R., LONG, S.P. (1981). Anatomical variation along the length of the *Zea mays* leaf in relation to photosynthesis. *New Phytologist*, 88, 595-605.
- LONG, S.P., INCOLL, L.D. (1979). The Prediction and Measurement of Photosynthetic Rate of *Spartina townsendii* in the Field. *Journal of Applied Ecology*, 16, 879-891.
- THOMAS, S.M., LONG, S.P. (1978).  $\text{C}_4$  Photosynthesis in *Spartina townsendii* at Low and High Temperatures. *Planta*, 142, 171-174.
- LONG, S.P., WOOLHOUSE, H.W. (1978). The Responses of Net Photosynthesis to Light and Temperature in *Spartina townsendii*, a  $\text{C}_4$  Species from a Cool Temperate Climate. *Journal of Experimental Botany*, 29, 803-814.
- LONG, S.P., WOOLHOUSE, H.W. (1978). The Responses of Net Photosynthesis to Vapour Pressure Deficit and  $\text{CO}_2$  Concentration in *Spartina townsendii*, a  $\text{C}_4$  Species from a Cool Temperate Climate. *Journal of Experimental Botany*, 29, 567– 577.
- INCOLL, L.D., LONG, S.P., ASHMORE, M.R. (1977). SI Units in Publications in Plant Science. *Current Advances in Plant Science*, 28, 331-343.

COOMBS, J., BALDRY, C., BUCKE, C., LONG, S.P. (1975). o-Diphenol: Oxygen oxidoreductase from leaves of sugar cane. *Phytochemistry*, 13, 2703-2708.

LONG, S.P., INCOLL, L.D., WOOLHOUSE, H.W. (1975). C<sub>4</sub> photosynthesis in plants from cool temperate regions, with particular reference to *Spartina townsendii*. *Nature*, 257, 622-624.

**B. REFEREED CHAPTERS IN EDITED BOOKS (publications preceded by invited lecture):**

LONG S.P., KARP A., BUCKERIDGE M.S., DAVIS S.C., JASIWAL D., MOORE P.H., MOOSE S.P., MURPHY D.J., ONWONA-AGYEMANG S. & VONSHAK A. (2015) Feedstocks for Biofuels and Bioenergy. In: *Bioenergy & Sustainability* (ed G. Souza), SCOPE, Paris, pp. 302-347.

DAVIS, S.C., LONG, S.P. (2014). Sisal/Agave. *Industrial Crops*, 9, 335-349.

LEAKEY, A. D. B., AINSWORTH, E.A., Bernacchi, C.J. Zhu, X.-G., LONG, S.P. AND ORT, D.R. (2012) Photosynthesis in a CO<sub>2</sub>-Rich Atmosphere. *Photosynthesis: Plastid Biology, Energy Conversion and Carbon Assimilation*, (Ed. J. J. EatonRye, B. C. Tripathy and T. D. Sharkey) Vol. 34, 733-768.

PYTER R., HEATON E.A., DOHLEMAN F.G., VOIGT T.B. and LONG S.P. (2009) Agronomic Experiences with *Miscanthus x giganteus* in Illinois, USA. *Biofuels: Methods and Protocols, Methods in Molecular Biology*, vol. 581 (Ed. J. R. Mielenz) Humana Press-Springer, New York. 41-52.

ORT, D.R., AINSWORTH, E.A., ALDEA, M., ALLEN, D.J., BERNACCHI, C.J., BERENBAUM, M.R., BOLLERO, G.A., CORNIC, G., DAVEY, P.A., DERMODY, O.C., DOHLEMAN, F.G., HAMILTON, J.G., HEATON, E.A., LEAKEY, A.B.D., MAHONEY, J., MIES, T.A., MORGAN, P.B., NELSON, R.L., ROGERS, A., ZANGERL, A.R., ZHU, X-G., DELUCIA, E.H. AND LONG, S.P. (2006) SoyFACE: The effects and interactions of elevated [CO<sub>2</sub>] and [O<sub>3</sub>] on soybean. *Managed Ecosystems and CO<sub>2</sub>: Case studies, processes and perspectives*, (Eds. J. Nösberger, S.P. Long, R.J. Norby, M. Stitt, G.R. Hendrey, and H. Blum). *Ecological Studies Series*, Vol. 187, Springer-Verlag, Berlin, 71-86.

LONG, S.P., AINSWORTH, E.A., BERNACCHI, C.J., DAVEY, P.A., HYMUS, G.P., LEAKEY, A.D.B., MORGAN, P.B. AND OSBORNE, C.P. (2006) Long term responses of photosynthesis and stomata to elevated [CO<sub>2</sub>] in managed ecosystems. *Managed Ecosystems and CO<sub>2</sub>: Case studies, processes and perspectives*, (Eds. J. Nösberger, S.P. Long, R.J. Norby, M. Stitt, G.R. Hendrey, and H. Blum), *Ecological Studies Series*, Vol. 187, Springer-Verlag, Berlin, 216-232.

LONG, S.P., ZHU, X.-G., NAIDU, S.L., RAINES, C.A. & ORT, D.R. (2005) Limits to Efficiencies of Primary Production – Constraints and Opportunities. *Yields of Farmed Species. Constraints and Opportunities in the 21st Century*. Nottingham Easter School Series, (Eds. S.-B. R. & J. Wiseman), Nottingham University Press, Nottingham, UK. 167-192.

LONG, S.P., NAIDU, S.L. (2002) Effects of Oxidants at the Biochemical, Cell and Physiological Levels. *Air Pollution and Plants*, 2nd Edn. (Eds. J.N.B. Bell & M. Treshow), J. Wiley, London, 69-88.

ORT, D.R., LONG, S.P. (2002) Converting solar energy into crop production. *Plants, Genes & Biotechnology*, (Eds. Chrispeels, M.J. & Sadava, D.E.), American Society for Plant Biology/Jones & Bartlett Publishers, Boston, 240-269.

- YOUNG, K.J, LONG, S.P. (2000) Crop Ecosystem Responses to Climatic Change: Maize and Sorghum. *Climate Change and Global Crop Productivity*, (Eds. Reddy, K.K., Hodges, H.), CAB International, Wallingford, 107-132.
- LONG, S.P. (1999) Understanding the impacts of rising CO<sub>2</sub>: the contribution of environmental physiology. *Physiological Plant Ecology*, (Eds. Press, M.C., Scholes, J.D., Barker, M.G.), Symposia of the British Ecological Society, Blackwell Sci., Oxford, 263-282.
- LONG, S.P. (1998) C<sub>4</sub> Photosynthesis – Environmental Responses. *The Biology of C<sub>4</sub> Photosynthesis*, (Eds. R. F. Sage & R.K. Monson), Academic Press, San Diego, 215-249.
- LONG, S.P. (1998) Rubisco, the key to improved crop production for a world population of more than eight billion people? Feeding the World Population – Rank Prize Funds Symposium, (Eds. J.C. Waterlow & R. Riley), Oxford University Press, Cary NC., 124-136.
- LONG, S.P., OSBORNE, C.P. & HUMPHRIES, S.W. (1996) Photosynthesis in atmospheric and climate change. *Global Change: Effects on Coniferous Forests and Grasslands – SCOPE 56*, (Eds. A. Breymeyer, D.O. Hall, J.M. Melillo, G.I. Ågren), UNEP/Wiley, Chichester, 121-159.
- LONG, S.P. (1994) The application of physiological and molecular understanding of the effects of the environment on photosynthesis in the selection of novel “fuel” crops; with particular reference to C<sub>4</sub> perennials. *Plant Production on the Threshold of a New Century – Congress of the 75th Anniversary of Wageningen Agricultural University*, (Eds. Struick, P.C., Vredenberg, W., Renkema, J.A., Parlevet, J.E.), Kluwer Academic, Dordrecht, 231-244.
- BAKER, N.R, FARAGE, P.K., STIRLING, C.M. & LONG, S.P. (1994) Photoinhibition of crop photosynthesis in the field at low temperatures. *Photoinhibition of Photosynthesis*, (Eds. N.R. Baker & J.R. Bowyer), Bios Scientific Publ., Oxford, 349-363.
- LONG, S.P. (1994) The potential effects of concurrent increases in temperature, CO<sub>2</sub> and O<sub>3</sub> on net photosynthesis, as mediated by RubisCO. *Plant Responses to the Gaseous Environment: Molecular, Metabolic and Physiological Aspects*, (Eds. R.G. Alscher & A. J. Wellburn), Chapman and Hall, London, 21-38.
- LONG, S.P. (1994) Resource capture by single leaves. *Resource Capture by Crops: Proc. 52nd University of Nottingham Easter School*, (Eds. J.L. Monteith, R.K. Scott & M.H. Unsworth), Nottingham Univ. Press, Nottingham, 17-34.
- DRAKE, B.G., ARP, W.J., LONG, S.P., LAWLOR, D.W. (1993) Photosynthesis of the C<sub>4</sub> sedge, *Scirpus olneyi*, after long-term exposure to elevated CO<sub>2</sub> in open top chambers in the field. *Trends in Photosynthesis Research*, (Eds. Barber, J., Guerrero, M.G. & Medrano, H.), Intercept, Andover, 339-44.
- LONG, S.P., FARAGE, P.K., AGUILERA, C. & MACHARIA, J.M.N. (1993) Damage to photosynthesis during chilling and freezing, and its significance to the photosynthetic productivity of crops. *Trends in Photosynthesis Research*, (Eds. Barber, J., Guerrero, M.G. & Medrano, H.), Intercept, Andover, 345-56.
- LONG, S.P. (1993) The significance of light-limited photosynthesis to crop canopy carbon gain and productivity – A theoretical analysis. *Photosynthesis – Photoreactions to Plant Productivity*, (Eds. Abrol, Y.P., Mohanty, P. & Govindjee), Kluwer, Dordrecht, 547-560.

- BINGHAM, M.J. & LONG, S.P. (1993) Equipment for plant physiology research in a changing environment. *Photosynthesis and Production in a Changing Environment: A Field and Laboratory Manual*, (Eds. D.O. Hall, J.M.O. Scurlock, H.R. Bolh ar-Nordenkamp, R.C. Leegood, and S.P. Long). Chapman & Hall, London, pp. 356-421.
- ROBERTS, M.J., S.P. LONG, L.L. TIESZEN & C.L. BEADLE (1993) Measurement of plant biomass and net primary production of herbaceous vegetation. *Photosynthesis and Production in a Changing Environment: A Field and Laboratory Manual*, (Eds. D.O. Hall, J.M.O. Scurlock, H.R. Bolh ar-Nordenkamp, R.C. Leegood, and S.P. Long), Chapman & Hall, London, 1-21.
- NOBEL, P.S., I.N. FORSETH & S.P. LONG (1993) Canopy structure and light interception. *Photosynthesis and Production in a Changing Environment: A Field and Laboratory Manual*, (Eds. D.O. Hall, J.M.O. Scurlock, H.R. Bolh ar-Nordenkamp, R.C. Leegood, and S.P. Long), Chapman & Hall, London, 79-90.
- LONG, S.P. AND J.-E. H ALLGREN (1993) Measurement of CO<sub>2</sub> assimilation by plants in the field and laboratory. *Photosynthesis and Production in a Changing Environment: A Field and Laboratory Manual*, (Eds. D.O. Hall, J.M.O. Scurlock, H.R. Bolh ar-Nordenkamp, R.C. Leegood, and S.P. Long), Chapman & Hall, London, 129-167.
- LONG, S.P. & DRAKE, B.G. (1992) Photosynthetic CO<sub>2</sub> assimilation and rising atmospheric CO<sub>2</sub> concentrations. *Crop Photosynthesis: Spatial and Temporal Determinants*, (Eds. N.R. Baker and H. Thomas), Elsevier, Amsterdam, 69-103.
- LONG, S.P. & JONES, M.B. (1992) Introduction and general methods. *Primary Productivity of Tropical Ecosystems*, (Eds. LONG, S.P., Roberts, M.J. & Jones, M.B.), Chapman & Hall, London, 1-24.
- JONES, M.B., LONG, S.P., ROBERTS, M.J. (1992) Synthesis of tropical grasslands productivity. *Primary Productivity of Tropical Ecosystems*, (Eds. LONG, S.P., Roberts, M.J. & Jones, M.B.), Chapman & Hall, London, 212-255.
- LONG, S.P. & DRAKE, B.G. (1992) Photosynthetic CO<sub>2</sub> assimilation and rising atmospheric CO<sub>2</sub> concentrations. *Crop Photosynthesis: Spatial and Temporal Determinants*, *Topics in Photosynthesis Research Vol. 12*, (Eds. N.R. Baker and H. Thomas), Elsevier, Amsterdam, 69-104.
- LONG, S.P., DUNN, R., JACKSON, D., OTHMAN, S.B. and YAAKUB, M.H. (1990) The primary productivity of *Spartina Anglica* in an East Anglian estuary. *Spartina anglica – A Research Review*, (Eds. A.J. Gray & P.E.M. Benham), Institute of Terrestrial Ecology, H.M.S.O., London, 34-38.
- LONG, S.P. (1990) The primary productivity of *Puccinellia maritima* and *Spartina anglica*: A simple predictive model of response to climatic change. *Expected Effects of Climatic Change on Marine Coastal Ecosystems*, (Eds. Beukema, J.J., Wolff, W.J. & Brouns, J.J.W.M), Kluwer Academic, Dordrecht, 33-40.
- LONG, S.P. (1989) Field measurement of gas exchange. *Towards a More Exact Ecology – Proceedings of the Jubilee Symposium of the British Ecological Society*, (Eds. P.J. Grubb & J.B. Whittaker), Blackwell Scientific Publications, Oxford, 33-61.
- SCURLOCK, J.M.O., LONG, S.P., IMBAMBA, S.K., GARCIA, E., KAMNALRUT, A., HALL, D.O. (1989). Remote sensing of primary production in natural tropical grasslands and artificial mixed-species canopies. *Proceedings of the 11th ISB– Congress*, (Eds. D. Driscoll & E. Box). SPB-Academic, The Hague, 379-397.

- LONG, S.P., GARCIA MOYA, E., IMBAMBA, S.K., KAMNALRUT, A., SCURLOCK, J.M.O., SHEN, Y.K. HALL, D.O. (1988) The Productivity of Natural Tropical Grass Communities: A Reappraisal. Ecology of Arable Lands, (Eds. M. Clarhom & L. Bergstroem), Kluwer Academic, Dordrecht, 9– 20.
- BAKER, N.R., LONG, S.P., ORT, D.R. (1988) The effects of temperature on photosynthesis. Plants and Temperature, (Eds. S.P. Long & F.I. Woodward), Cambridge University Press, Cambridge (in press).
- LONG, S.P., BAKER, N.R. (1986) Photosynthesis in Saline Environments. Photosynthesis in Contrasting Environments, Topics in Photosynthesis Research, Vol. 7 (Eds. N.R. Baker and S.P. Long), Elsevier, Amsterdam, 63-102.
- LONG, S.P. (1986) Instrumentation for the Measurement of CO<sub>2</sub> assimilation by Crop Leaves. Advanced Agricultural Instrumentation, NATO Advanced Studies Institute (Ed. W. Gensler), NATO/Martinus Nijhoff, Amsterdam, 39-91.
- ROBERTS, M.J., LONG, S.P. & TIESZEN, L.L. (1985) Measurement of Plant Biomass and Net Primary Production. Techniques in Bioproductivity and Photosynthesis, 2nd Edn. (Eds. J. Coombs, D.O. Hall, S.P. Long & J.M.O. Scurlock), Pergamon, Oxford, 1-19.
- NOBEL, P.S., LONG, S.P. (1985) Canopy Structure and Light Interception. Techniques in Bioproductivity and Photosynthesis, 2nd Edn. (Eds. J. Coombs, D.O. Hall, S.P. Long & J.M.O. Scurlock), Pergamon, Oxford, 229-250.
- LONG, S.P., IRELAND, C.R. (1985) The measurement and control of air and gas flows for the determination of gaseous exchanges of living organisms. Instrumentation for Environmental Physiology, (Eds. B. Marshall & F.I. Woodward), S.E.B. Seminar Series, Cambridge University Press, 123-137.
- LONG, S.P. & HÄLLGREN, J.-E. (1985) Measurement of CO<sub>2</sub> assimilation by plants in the field and laboratory. Techniques in Bioproductivity and Photosynthesis, 2nd Edn. (Eds. J. Coombs, D.O. Hall, S.P. Long & J.M.O. Scurlock), Pergamon, Oxford, 62-94.
- LONG, S.P. (1985) Leaf Gas Exchange. Photosynthetic Mechanisms and the Environment, (Eds. J. Baker and N.R. Baker), Elsevier, Amsterdam, 453-499.
- BINGHAM, M.J., LONG, S.P. (1985) Equipment for Field and Laboratory Studies of Whole Plant and Crop Photosynthesis and Productivity Research. Techniques in Bioproductivity and Photosynthesis, 2nd Edn. (Eds. J. Coombs, D.O. Hall, S.P. Long & J.M.O. Scurlock), Pergamon, Oxford, 229-250.
- LONG, S.P., IRELAND, C.R. (1984) An Introduction to Microcomputers. Microcomputers in Biology – A Practical Approach, (Eds. C.R. Ireland and S.P. Long) I.R.L. Press, Oxford, 123-137.
- LONG, S.P. (1981) Measurement of Photosynthetic Gas Exchange. Techniques in Photosynthesis and Productivity, (Eds. J. Coombs & D.O. Hall), Pergamon, Oxford, 25-36.
- LONG, S.P. (1981) Whole Plant Photosynthesis and Productivity. Techniques in Photosynthesis and Productivity, (Eds. J. Coombs & D.O. Hall), Pergamon, Oxford, 3-5.
- DUNN, R., LONG, S.P., THOMAS, S.M. (1981) The effect of temperature on the growth and photosynthesis of the temperate C<sub>4</sub> grass *Spartina townsendii*. Plants and Their Atmospheric Environment, (Eds. J. Grace, E. D. Ford & P. G. Jarvis), Blackwell, Oxford, 303-311.

LONG, S.P., WOOLHOUSE, H.W. (1979) Primary Production in Spartina Marshes. Ecological Processes in Coastal Environments, (Eds. R.L. Jefferies & A.J. Davy), Blackwell, Oxford, 333-352.

### **C. PAPERS PUBLISHED IN CONFERENCE PROCEEDINGS:**

ROGERS, A., BRYANT, J.B., RAINES, C.A., LONG, S.P., BLUM, H. & FREHNER, M. (1995) Acclimation of photosynthesis to rising CO<sub>2</sub> concentration in the field. Is it determined by source/sink balance? Photosynthesis: From Light to Biosphere, Vol. V, (Ed. P. Mathis), Dordrecht: Kluwer, 1001-1004.

OSBORNE, C.P., LONG, S.P., GARCIA, R.L., WALL, G.W., KIMBALL, B.A., PINTER, P.J., LAMORTE, R.L. & HENDREY, G.R. (1995) Do shade and elevated CO<sub>2</sub> concentration have an interactive effect on photosynthesis? Photosynthesis: From Light to Biosphere, Vol. V, (Ed. P. Mathis), Dordrecht: Kluwer, 929-932.

MCKEE, I.F., FARAGE, P.K. & LONG, S.P. (1995) The interactive effects of elevated CO<sub>2</sub> and O<sub>3</sub> concentration on photosynthesis in spring wheat. Photosynthesis: From Light to Biosphere, Vol. V, (Ed. P. Mathis), Dordrecht: Kluwer, 949-952.

MARTIN, M.J., HUMPHRIES, S.W., FARAGE, P.K., MCKEE, I.F. & LONG, S.P. (1995) A mechanistic model for the prediction of the effects of rising tropospheric ozone concentration on wheat photosynthesis. Photosynthesis: From Light to Biosphere, Vol. V, (Ed. P. Mathis), Dordrecht: Kluwer, 829-832.

LONG, S.P., FARAGE, P.K., NIE, G.Y. & OSBORNE, C.P. (1995) Photosynthesis and rising CO<sub>2</sub> concentration. Photosynthesis: From Light to Biosphere, Vol. V, (Ed. P. Mathis), Dordrecht: Kluwer, 729-736.

HENDREY, G.R., LONG, S.P., BAKER, N. R. & MCKEE, I. F. (1995) Response of leaf photosynthesis to short-term fluctuations in atmospheric carbon dioxide. Photosynthesis: From Light to Biosphere, Vol. V, (Ed., P. Mathis), Dordrecht: Kluwer, 965-968.

FARAGE, P.K. & LONG, S.P. (1995) Interaction of CO<sub>2</sub> and nitrogen supply on photosynthetic acclimation in wheat. Photosynthesis: From Light to Biosphere, Vol. V, (Ed. P. Mathis), Dordrecht: Kluwer, 985-988.

DAVEY, P., FARAGE, P.K. & LONG, S.P. (1995) Photosynthetic acclimation to growth in elevated CO<sub>2</sub> in two native UK herbaceous species and associated interactions with leaf nitrogen and temperature. Photosynthesis: From Light to Biosphere, Vol. V, (Ed. P. Mathis), Dordrecht: Kluwer, 917-920.

BAKER, N.R., FARAGE, P.K., STIRLING, C.M. & LONG, S.P. (1994) Photoinhibition of crop photosynthesis in the field at low temperatures. Photoinhibition of Photosynthesis, (Eds. N.R. Baker & J.R. Bowyer), Bios Scientific Publ., Oxford, 349-363.

LONG, S.P. (1994) The application of physiological and molecular understanding of the effects of the environment on photosynthesis in the selection of novel "fuel" crops; with particular reference to C<sub>4</sub> perennials. Plant Production on the Threshold of a New Century – Congress of the 75th Anniversary of Wageningen Agricultural University, (Eds. Struick, P.C., Vredenberg, W., Renkema, J.A., Parlevet, J.E.), Kluwer Academic, Dordrecht, 231-244.

LONG, S.P. (1994) The potential effects of concurrent increases in temperature, CO<sub>2</sub> and O<sub>3</sub> on net photosynthesis, as mediated by RubisCO. Plant Responses to the Gaseous Environment: Molecular, Metabolic and Physiological Aspects, (Eds., R.G. Alscher & A. J. Wellburn), Chapman and Hall, London, 21-38.



- LONG, S.P. (1994) Resource capture by single leaves. Resource Capture by Crops: Proc. 52nd University of Nottingham Easter School, (Eds., J.L. Monteith, R.K. Scott & M.H. Unsworth), Nottingham Univ. Press, Nottingham, 17-34.
- NIE, G.-Y. & LONG, S.P. (1992) The effect of prolonged growth in elevated CO<sub>2</sub> concentrations in the field on the amounts of different leaf proteins. Proc. IXth Int. Congr. Photosyn. Res., (Ed., Murata, N.), Kluwer Academic, Dordrecht.
- LONG, S.P., NIE, G.-Y., DRAKE, B.G., FARAGE, P.K., HENDREY, G.R. & LEWIN, K.H. (1992) The implications of concurrent increases in temperature, CO<sub>2</sub> and O<sub>3</sub> for terrestrial C<sub>3</sub> photosynthesis. Proc. IXth Int. Congr. Photosyn. Res., (Ed., Murata, N.), Kluwer Academic, Dordrecht.
- LONG, S.P. & DRAKE, B.G. (1992) Photosynthetic CO<sub>2</sub> assimilation and rising atmospheric CO<sub>2</sub> concentrations. Crop Photosynthesis: Spatial and Temporal Determinants, (Eds., N.R. Baker and H. Thomas), Elsevier, Amsterdam, 69-103.
- HULL, M.R., LONG, S.P. & RAINES, C.R. (1990) The effects of temperature on activities of carbon metabolism enzymes in *Zea mays* L. seedlings. Current Research in Photosynthesis, Vol. 4, (Ed. M. Baltscheffsky), Kluwer Academic, Dordrecht, 675-678.
- FARAGE, P.K., LONG, S.P., LECHNER, E. & BAKER, N.R. (1990) Analysis of the mechanisms of ozone damage to photosynthesis in vivo. Current Research in Photosynthesis, Vol. 4, (Ed. M. Baltscheffsky), Kluwer Academic, Dordrecht, 591– 594.
- LONG, S.P., POTTER, L., BINGHAM, M.J. & STIRLING, C.M. (1990) An analysis of limitations to the production of C<sub>4</sub> perennials as ligno-cellulosic biomass crops, with reference to trials in E. England. Biomass for Energy and Industry, Vol. 1, (Eds. G. Grassi, G. Gosse & G. dos Santos) Elsevier Applied Science, London, 235-241.
- GROOME, Q.J., LONG, S.P. & BAKER, N.R. (1990) Photoinhibition of photosynthesis in a Winter Wheat crop. Current Research in Photosynthesis, Vol. 2, (Ed. Baltscheffsky) Kluwer Academic, Dordrecht, 463-466.
- GRAVETT, A.E. & LONG, S.P. (1990) Intraspecific variation in susceptibility to photoinhibition during chilling of *Cyperus longus* L. populations from Europe. Current Research in Photosynthesis, Vol. 4, (Ed. Baltscheffsky) Kluwer Academic, Dordrecht, 475-478.
- JAHNKE, L.S., HULL, M.R. & LONG, S.P. (1990) Chilling stress and active-oxygen enzymes in *Zea mays* and *Zea diploperennis*. Current Research in Photosynthesis, Vol. 4 (Ed. Baltscheffsky) Kluwer Academic, Dordrecht, 683-686.
- LONG, S.P., FARAGE, P.K., GROOME, Q., MACHARIA, J.M.N. & BAKER, N.R. (1990) Damage to photosynthesis during chilling and freezing, and its significance to the photosynthetic productivity of field crops. Current Research in Photosynthesis, Vol. 4, (Ed. Baltscheffsky) Kluwer Academic, Dordrecht, 835– 842.
- LONG, S.P., BINGHAM, M.J., HULL, M.R., IRELAND, C.R., & POTTER, L. (1989) The potential of C<sub>4</sub> cord-grasses and galingale for low input biomass production in Europe – Growth, photosynthesis and dry matter yields of stands in Eastern England. Euroforum – New Energies, Vol. 3, (Ed. G. Grassi & W. Palz), Stephens Associates, Bedford, 231-236.
- JONES, M.B., LONG, S.P., McNALLY, S.F. (1988) The potential productivity of C<sub>4</sub> Cordgrass and Galingale for low input biomass production in Europe – Plant Establishment. Biomass for Energy and Industry, (Eds. G. Grassi, B. Delmon, J.– F. Molle & H. Zibetta), Commission of the European Communities/Elsevier Applied Science, London, 106-110.

MASON, C.F., LONG, S.P. (1987) The removal of field corners from agricultural production, Bovingdon Hall, Essex. Conservation Monitoring and Management, (Ed. R. Matthews), Countryside Commission, Cheltenham, 89-91.

MASON, C.F., LONG, S.P. (1987) Management of lowland broadleaves woodland, Bovingdon Hall, Essex. Conservation Monitoring and Management, (Ed. R. Matthews), Countryside Commission, Cheltenham, 37-41.

LONG, S.P. (1987) The productivity of C4 cord-grasses and galingale. Energy from Biomass 1, (Eds. G. Grassi & H. Zibetta), Commission of the European Communities/Elsevier Applied Science, London, 95-99.

LONG, S.P., NUGAWELA, A., BONGI, G., FARAGE, P.K. (1986) Chilling dependent photoinhibition of photosynthetic CO<sub>2</sub> uptake. Proceedings VIIth International Congress on Photosynthesis Research, Vol. IV (Ed. W.J. Biggins), Martinus Nijhoff, Dordrecht, 131-138.

IRELAND, C.R., BAKER, N.R., LONG, S.P. (1986) Regulation of the Redox state of Photosystem II electron acceptors in vivo by CO<sub>2</sub> and O<sub>2</sub>. Proceedings IVth International Congress on Photosynthesis Research, Vol. II., (Ed. W.J. Biggins), Martinus Nijhoff, Dordrecht, 557-560.

FARAGE, P.K., LONG, S.P. (1986) Damage to Maize Photosynthesis in the field during periods when chilling is combined with high photon fluxes. Proceedings VIIth International Congress on Photosynthesis Research, Vol. IV., (Ed. W.J. Biggins), Martinus Nijhoff, Dordrecht, 139-143.

IRELAND, C.R., LONG, S.P., BAKER, N.R. (1984) Temperature and Carbon dioxide induced changes in Chlorophyll fluorescence and Carbon fixation during Photosynthetic induction in C4 Maize Leaves. Advances in Photosynthesis Research, Vol.4, (Ed. C.Sybesma), Martinus Nijhoff/Dr. W. Junk, The Hague, 479-482.

LONG, S.P. (1983) Photosynthetic CO<sub>2</sub> assimilation in C4 species at low temperatures. A computer model for the analysis of limitations and inter-specific variation. Stress Effects on Photosynthesis, (Eds. R. Marcelle & H. Clijsters), Martinus- Nijhoff, The Hague, 237-244.

LONG, S.P. (1982) Medicion del Intercambio Gaseoso Fotosintetico. Desierto y Ciencia 82, (Edicion Especial), 28-33.

LONG, S.P. (1982) Fotosintesis y Productividad de la Planta Total. Desierto y Ciencia 82, (Edicion Especial), 6-8.

LONG, S.P. (1981) An Introduction to Saltmarshes. Solent Saltmarsh Symposium, (Eds. F. Stranack & J. Coughlan), Solent Protection Society, Winchester, 1-7.

NEWTON, B., BAKER, N.R., LONG, S.P., LAWLOR, D.W. (1981) Correlated changes in Carbon assimilation and in vivo Photochemical function in Water stressed Maize. Vth International Congress on Photosynthesis, Vol. 6, (Ed. G. Akoyonoglou), Balaban, Philadelphia, 209-218.

EAST, T.M., LONG, S.P., BAKER, N.R. (1981) Changes in in vivo Photo- synthesis of Zea mays induced by low temperature stress. Vth International Congress on Photosynthesis, Vol.6, (Ed. G. Akoyonoglou), Balaban, Philadelphia, 369-77.

LONG, S.P. (1979) C4 Photosynthesis in Cool Temperate Regions. Biological Applications of Solar Energy, (Eds. A. Gnanam & J. Kahn), Macmillan, Madras, 73-75.

LONG, S. P. (1977) Solar Energy Conversion in Biology – A Report of the Symposium. IVth International Congress on Photosynthesis, (Eds. J. Coombs, H. Goodwin & D.O. Hall), Biochemical Society, London, 677-682.

#### **D. AUTHORED BOOKS:**

BEADLE, C.L., LONG, S.P., IMBAMBA, S.K., OLEMBO, R.J., HALL, D.O. (1985) *Photosynthesis in Relation to Plant Production in Terrestrial Ecosystems*. United Nations Environment Programme, Tycooly International, Oxford. 156 pages.

LONG, S.P., MASON, C.F. (1983) *Saltmarsh Ecology*, Tertiary Level Biology Series. Blackie, Glasgow. 180 pages.

#### **E. EDITED AND PART AUTHORED BOOKS:**

NÖSBERGER, J., LONG, S.P., NORBY, R.J., STITT, M., HENDREY, G.R. & BLUM H. (2006) *Managed Ecosystems and CO<sub>2</sub>: Case studies, processes and perspectives*, Ecological Studies Series, Vol. 187, Springer-Verlag. 479 pages.

HALL, D.O., SCURLOCK, J.M.O., BOLHAR-NORDENKAMPF, H.O., LEEGOOD, R.C. & LONG, S.P. (1993) *Photosynthesis and Production in a Changing Environment: a Field and Laboratory Manual*, Chapman & Hall, London. 464 pages.

LONG, S.P., ROBERTS, M.J. & JONES, M.B. (1992) *Primary Productivity of Tropical Ecosystems*, Chapman & Hall, London. 267 pages.

LONG, S.P., WOODWARD, F.I. (1988) *Plants and Temperature*, Symposium of the Society for Experimental Biology, Cambridge University Press. 406 pages.

BAKER, N.R., LONG, S.P. (1986) *Photosynthesis in Contrasting Environments*, Elsevier, Amsterdam. 423 pages.

COOMBS, J., HALL, D.O., LONG, S.P. & SCURLOCK, J.M.O. (1985) *Techniques in Bioproductivity and Photosynthesis*, Pergamon Press, Oxford. 298 pages (2nd reprint, with corrections, 1987).

- Also – Chinese translation of above (1987) *Academica Sinica*, Beijing.
- Also – Spanish translation of above (1988) *CONACYT*, Mexico City.
- Also – Russian translation of above (1988) *Pergamon Press/Academy of Sciences*, Moscow.
- Also – Portuguese translation of above (1990) *Pergamon Press*.

IRELAND, C.R., LONG, S.P. (1984) *Microcomputers in Biology*, IRL Press, Oxford. 324 pages.

#### **F. PATENTS**

LONG, S.P., ALTPETER, F., KARAN, R., MOOSE, S.P., JAIKUMAR, N.S., SWAMINATHAN, K., XIE, L. (2017). *Methods to Increase Photosynthetic Rates in Plants U.S. Patent 20,170,022,512,2017*

GRENNAN, A. K., ORT, D. R., MOOSE, S. P., BILGIN, D. D., CLEMENTE, T., ALTPETER, F., & LONG, S. P. (2016). *Plants having Increased biomass and methods for making the same U.S. Patent Application No. 14/995,109*.

LONG, S.P., SINGH, V., HUANG, H. (2013). *Separation process of oil and sugars from biomass. US Provisional 61/892, 211*.