UNIVERSITAT DE BARCELONA

Facultat de Biologia Diagonal, 623
08028 Barcelona

ACTA DE LA REUNIÓ EXTRAORDINÀRIA DE LA JUNTA DE FACULTAT FACULTAT DE BIOLOGIA

Núm. de la sessió: 3/23
Data: 29 de maig de 2023
Hora: de 12h05 a 12h12
Lloc: **Telemàticament per** Teams

Assistents

Rosina Gironès (com a degana)
Magda Grifoll (com a vicedegana de Qualitat, Innovació i Professionalització)
Albert Martínez (com a vicedegà Acadèmic)
Dolors Vinyoles (com a vicedegana de Recerca)
Marta Camps (com a vicedegana de Mobilitat i Relacions Internacionals)
Neus Carbó (com a secretària Acadèmica, Doctorat i Igualtat)

J. J. Alfonso
R. Araújo
C. Balsalobre
J. Casado
J. Fort
M. Giralt
M. Gorris
D. López
I. Muñoz
E. Pardina
A. Rosa
S. Sabaté
G. Viscor

Hi assisteixen com a convidats: E. Esteban, I. Ramírez, X. Remesar
Han excusat la seva absència: T. Sauras, J. Gutiérrez

Ordre del dia (punt únic)

1. Proposta de candidatura a *Honoris Causa* per part del Dr. Santi Sabaté Jorba. Valoració i aprovació, si s'escau (Annex_1, Annex_2 i Annex_3).

Desenvolupament de la sessió

1. **Proposta de candidatura a *Honoris Causa* per part del Dr. Santi Sabaté Jorba. Valoració i aprovació, si s'escau (Annex_1, Annex_2 i Annex_3).**

La degana inicia la sessió i tot seguit li dona la paraula al director del departament de BEECA, el Dr. Santi Sabaté Jorba, el qual presenta els mèrits de la Dra. Belinda Medlyn (descrits en els Annexes_1, 2 i 3) per a ser proposada com a candidata a doctora *Honoris Causa* per la UB en el curs 2023-2024.
Un cop feta l'exposició de mèrits, eleva la proposta per a la seva aprovació per part de la Junta de Facultat.
La Junta de Facultat aprova per assentiment i per unanimitat recolzar la petició del conferiment del títol de doctora *Honoris Causa* a la Dra. Belinda Medlyn.

Acords

1. S'aprova per unanimitat dels assistents recolzar la petició del conferiment del títol de doctora *Honoris Causa* a la Dra. Belinda Medlyn.

I sense més temes a tractar, la degana aixeca la sessió a les 12:12, de la qual, com a secretària, estenc aquesta acta.

La Secretària de la Facultat

Maria Neus Carbo Carbo - DNI 79285171P (TCAT)

Firmado digitalmente por Maria Neus Carbo Carbo - DNI 79285171P (TCAT)
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Mª Neus Carbó Carbó

Vist i plau
La Degana

Rosa Girones Llop - DNI 77277255S (TCAT)

Firmado digitalmente por Rosa Girones Llop - DNI 77277255S (TCAT)
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Rosina Gironés Llop

Annexos

1. Annex_1_Resum Proposta *Honoris Causa* 2023
2. Annex_2_Merits Explanation Belinda Medlyn
3. Annex_3_CURRICULUM VITAE_Medlyn

PROPOSTA HONORIS CAUSA 2023

Nom del candidat i Motivació i Mèrits (breu). Professor Belinda E. MEDLYN

És *Distinguished Professor* al *Hawkesbury Institute for the Environment, Western Sydney University*. Tot un exemple per les dones investigadores, doncs ha obert camí. Ha estat guardonada amb el 2019 *ARC Georgina Sweet Australian Laureate Fellow*, que dona suport a investigadors australians i internacionals destacats per construir la capacitat de recerca d'Austràlia, dur a terme programes de recerca innovadors i orientar investigadors primerencs.
És docent i investigadora que sobresurt per les seves contribucions en la comprensió i la modelització de les respostes de la vegetació a les condicions ambientals, inclosos els efectes del canvi climàtic i els esdeveniments extrems.
El padrí, el Dr. Santiago Sabaté, i la Dra. B. Medlyn, es coneixen i han col·laborat des de mitjans dels 90's quan eren post-docs en el marc de projectes europeus (ECOCRAFT i LTEEF-II) i els darrers anys amb l'intercanvi d'estudiants de doctorat, tant pel que fa a la experimentació com en la modelització de les respostes de la vegetació al canvi climàtic, àmbit en el que tenen publicacions conjuntes (DOI: 10.1111/gcb.15590, DOI: 10.1093/treephys/tpu072). També ambdós són membres del *Scientific Advisory Board de Land Life Company* on tenen el paper d'aportar, davant dels reptes ambientals que afrontem, coneixement científic per restauracions de la vegetació arreu del mon. Aquest reconeixement com a Doctora Honoris Causa a la UB, reforçarà les activitats de col·laboració ja establertes des de fa temps.
Recentment ha estat elegida per formar part de la *Australian Academy of Science*. El seu treball ha proporcionat una base convincent per a la predicció a llarg termini de les respostes de les plantes a l'augment de les concentracions de CO_2, l'escalfament de les temperatures i la sequera. El seu treball s'ha integrat en els models matemàtics utilitzats per predir la dinàmica del sistema terrestre a tot el món.
En definitiva, destaquen les seves contribucions innovadores per entendre i predir les respostes de les plantes al canvi climàtic, superant la divisió tradicional entre l'ecologia experimental i la modelització amb síntesis quantitatives innovadores, així com el seu suport i defensa del paper de la dona en la recerca.

Padrí: Santiago Sabaté. Secció Ecologia Departament de Biologia Evolutiva, Ecologia i Ciències Ambientals.
Altres membres de la secció d'Ecologia de BEECA que recolzen la proposta: Isabel Muñoz, Francesc Sabater, Jofre Carnicer, Elisenda Martínez

Short citation

Professor Belinda Medlyn is a plant physiological ecologist and mathematical modeller known for her ground-breaking contributions to understanding and predicting plant responses to climate change. Bridging the traditional divide between experimental ecology and modelling with innovative quantitative syntheses, her work has provided a compelling basis for long-term prediction of plant responses to rising CO_2 concentrations, warming temperatures, and drought. Her work has been integrated into the mathematical models used to predict Earth system dynamics worldwide.

Executive summary

Medlyn is an internationally renowned plant ecosystem modeler, whose work bridges the traditional divide between experimental data and models. She has been a leading force in developing a sound evidence basis to predict vegetation responses to climate change, particularly rising atmospheric CO_2, warming, and drought. Her ideas have influenced scientific practice in experimental and modelling communities alike. She is an inspirational role model and a strong advocate for women researchers, particularly those following non-traditional career paths.

Scientific achievement

Medlyn is known as one of the world's leading plant ecosystem modellers, and is particularly highly regarded for her work in bridging the gap between experimental data and models. She has an exceptional track record of working with experimental and modelling communities to synthesise experimental data into forms that can be incorporated into process-based models. Over her career, she has been the driving force behind numerous cutting-edge model-data syntheses. The model formulations developed through these syntheses have been incorporated into most major international vegetation models, and have been adopted as data frameworks by many experimental groups.

She has published over 170 peer-reviewed scientific articles, including over 110 articles in the seven years since she moved to a research-focused position at WSU. Her works have had a high citation impact; she has a median citation percentile of 91 percent and she has been listed as a Clarivate Analytics Highly-Cited Researcher since 2018. Her h-index of 63 (Web of Science) is exceptionally high given her extended period of part-time work.

In particular, she has made major contributions to the way that we understand and model vegetation responses to drought, elevated CO2, and warming.

Vegetation responses to drought

Medlyn has had a major impact in the area of modelling plant water use. She developed a model of stomatal conductance now universally known as the "Medlyn" model ([144]), which unified two previously disjunct theories. Under her mentorship, postdoc Dr Yan-Shih Lin assembled a group of ~ 50 international experimentalists and synthesized their data using the Medlyn model ([107]). The model and associated parameters have now been adopted into most of the major land-surface models including the Australian CABLE ([94],[96]), the US Community Land Model, and the UK Met Office JULES model, resulting in significant improvements in the capacity to model land-surface exchanges. For example, simulations with the CABLE model in collaboration with the ARC Centre for Excellence in Climate Science

demonstrated that the new information about stomatal behaviour has major implications for predicted heatwaves into the future ([90]).

Medlyn is now providing important intellectual leadership in understanding and predicting tree death in response to drought. Drought mortality is becoming a major threatening process under climate change, and Medlyn is at the forefront of attempts to understand, monitor and forecast this process in Australia. She has guided new experimentation to quantify the processes leading to tree mortality ([43], [48], [67]) and enabled their implementation into models to forecast mortality risk ([30], [64]).

Vegetation responses to eCO2

Medlyn has also made major contributions to our understanding of the effects of elevated CO_2 on trees. She played an important role in a long-term international collaboration to advance models using data from the major forest Free-Air CO2 Enrichment (FACE) Experiments ([55], [82], [102], [105], [114], [115], [118], [136]). While many similar model-data exercises have had rather uninteresting results, this project was exceptionally successful, with clear outcomes identifying how models should be improved, based on the data. Many of the innovative approaches employed in this project were originated by Medlyn. Her pioneering approaches are now being applied to new FACE experiments, such as the AmazonFACE experiment ([44]).

Her work has enabled the Eucalypt FACE (EucFACE) experiment in western Sydney to directly inform vegetation models. A model intercomparison in advance of the experiment, initiated by Medlyn, identified the major competing hypotheses to be tested, focusing experimental work on key measurements ([91]). Her research group also led the recent EucFACE synthesis paper, published in Nature ([32]), which summarised the impact of elevated CO_2 on the carbon balance of the forest, answering a long-held question as to the impact of elevated CO_2 on mature forests.

Vegetation responses to warming

Medlyn's work on modelling plant photosynthetic responses to temperature has been highly influential. Two foundational papers in 2002 ([161, 162]) identified that the process of photosynthetic temperature acclimation was missing from existing vegetation models, and used experimentation and data synthesis to develop a means to represent this process. This work stimulated much further experimental research (e.g. [120], [121]) and is now an important component of Earth system models attempting to predict feedbacks to climate from responses of forests to warming (e.g. [68]). Her research team remains at the forefront of synthesis in this area, with new work separating responses into acclimation and adaptation components ([57]).

National and international profile

Owing to the nature of her research, which connects a wide range of experimental and modelling work, Medlyn is well-known and highly regarded both nationally and internationally. She collaborates exceptionally widely, maintaining international research networks that bridge plant ecophysiology and vegetation modelling communities. She was recently appointed to chair the Australian Terrestrial Ecosystem Research Network (TERN) Scientific Advisory Committee.

She is regularly invited to speak at conferences, give seminars and participate in workshops.

In 2020 alone, she was invited to give seminars at five international universities (Otago, NZ; University of British Columbia, Canada; Northern Arizona University, Boston University, and the Berkeley Atmospheric Sciences Centre, USA), and to give keynote presentations at the annual Ecological Society of Australia meeting and the international ILEAPS (Integrated Land Ecosystem Atmosphere Processes Study) conference in New Zealand She was invited to be an instructor in an international postgraduate course in Land Carbon Cycle Modeling; a participant in an international workshop on drought mortality of trees, and an Australian workshop on ecosystem assessment; a panelist at the Ozflux 20th Anniversary Meeting; and a speaker at the Marcus Wallenberg Prize Symposium.

Medlyn's research is supported by state, national and international funding bodies. In 2019 she was awarded the prestigious ARC Georgina Sweet Laureate Fellowship for a project that aims to develop a unified dynamic vegetation model for Australia. As is typical of her work, the project will bring together disparate areas of research into a coherent quantitative framework, providing significant intellectual leadership in the field of ecosystem function.

In addition to the Laureate Fellowship, Medlyn currently holds ARC Discovery and Linkage funding for projects to predict drought impacts on grassland function and bushfire risk. She is collaborating in NSW Government funded research via Saving our Species and Bushfire Research Hub projects. She is currently a project partner on two UK NERC-funded projects, investigating carbon-nutrient interactions in temperate forests and plant acclimation to high temperature, and is the host for a UK Royal Society exchange grant. She has previously held 4 ARC Discovery and Linkage projects as lead CI, and has been a project partner in grants funded by the French Agence Nationale de la Recherche and the US Department of Energy.

She is an editor for one of the leading plant science journals, New Phytologist (currently ranked 7/234 journals in this field), and serves on the advisory board of the journal Global Change Biology. She is a Fellow of the Royal Society of New South Wales. She also serves on the advisory board of the International Union of Forestry Research Organisation's Working Group on Tree Mortality.

Leadership, mentorship

Medlyn is a strong advocate for early career researchers, women in science, and researchers with caring responsibilities. She is also an excellent advocate for interdisciplinarity, promoting mathematics, data and numeracy skills in biology and ecology. Furthermore, she is a strong voice for Australian ecosystems, with education and outreach work focusing on vegetation responses to climate change.

Working across experimental and modelling communities has given Medlyn many opportunities to mentor and guide other researchers, particularly women. Her collaborative approach to research sees her constantly working to develop and promote research connections and synergies, particularly among early career researchers. For example, she has been a key figure in the Sydney Plant Ecophysiology Group since 2000, organizing the seminars for several years and then mentoring the subsequent organisers. This group has provided many opportunities for Sydney-based plant scientists to collaborate across universities.

As a long-term part-time academic herself, Medlyn also advocates strongly for researchers to be able to follow alternative career pathways. In her role as Georgina Sweet Laureate Fellow, she plans to convene a national working group of academics and administrators to rethink the "pipeline" career model, and develop resources supporting non-linear career pathways.

A second goal of Medlyn's Fellowship is to encourage women and girls to develop stronger quantitative skills. She is one of very few female vegetation modellers and is an excellent role model for younger women in this field. Through all of her school outreach, undergraduate and postgraduate teaching, she has worked to inspire students to develop their numerical skills.

Medlyn is educating the public about her research through a citizen science initiative called the Dead Tree Detective. Medlyn launched this initiative after realising that tree health was at risk around Australia in drought and heatwaves. The initiative came into its own during the Big Dry of 2019; citizen scientists across south-eastern Australia contributed records to demonstrate the progression of tree death, culminating in the extensive bushfires. This work has been covered on radio, local newspapers and blogs, described in two pieces in the Conversation, and presented in talks to Landcare groups and "Science at the Local".

The Dead Tree Detective has become a central point of focus for researchers around the country working on tree mortality. Medlyn has organised two symposia on dieback to bring this research together (Ecological Society of Australia 2017, 2020). The bringing of these observations together has highlighted that there are common (and alarming) patterns of tree mortality related to drought and heatwaves.

CURRICULUM VITAE – Distinguished Professor Belinda E. MEDLYN

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ORCID: 0000-0001-5728-9827

Date of Birth: 2nd October 1968 **Nationality**: Australian

Academic Qualifications:

1992 - 1996
Ph.D., School of Biological Science, University of New South Wales.
1986 - 1989
B.Sc. (Maths) Honours (First Class), University of Adelaide.

Career History:

February 2015 onwards:
Professor, Hawkesbury Institute for the Environment, Western Sydney University
March 2018: Appointed Theme Leader, Ecosystem Function and Integration
October 2019: Appointed Distinguished Professor
January 2014 – January 2015:
Associate Professor, Department of Biological Sciences, Macquarie University
***January 2007 – December 2013:**
Senior Lecturer, Department of Biological Sciences, Macquarie University
***June 2005 – December 2006:**
UNSW Research Fellow employed on two research projects:
The Hawkesbury Forest Experiment (CO_2 x water effects on Eucalyptus)
BIOCON (CO_2 x nitrogen x biodiversity effects on N American grasslands)
***July 2000 – July 2004:**
ARC Post-doctoral Research Fellowship, University of New South Wales
May 1999 – April 2000:
Visiting Fellowship, Institut National de la Recherche Agronomique, Bordeaux, France.
April 1996 – March 1999:
Post-doctoral Research Associate, University of Edinburgh, U.K.
Mar 1990 - Oct 1991:
Quantitative Applications Division, Macquarie Bank, Sydney

* From 2002 – 2011 I worked part-time. In 2002 and 2004 I had two periods of maternity leave totalling 14 months. I worked 0.5 FTE 2003-09 and 0.8 FTE 2010-11.

PRIZES AND HONOURS

- Ralph Slatyer Medal (2022)
- Thomson Reuters/Clarivate - Highly Cited Researcher (2018 - 2022)
- Fellow of the Royal Society of NSW (2020)
- Awarded ARC Georgina Sweet Laureate Fellowship (2019)

- Distinguished Professor – awarded 2019 (Western Sydney University)
- Western Sydney University Researcher of the Year (2019)

MAJOR SERVICE ROLES

- Editor, New Phytologist (2016 - present)
- Editorial Advisory Board, Global Change Biology (2020 – present)
- Chair, TERN Scientific Advisory Board (2021 – present)
- Scientific Advisory Board, Land Life Company (2022 – present)
- Awards Committee, Royal Society of NSW (2021 – present)
- Oceania Ecological Forecasting Initiative committee (2022 – present)

GRANTS, FELLOWSHIPS & CONSULTANCIES

1. *Australian Citizen Science Association* 2023. Monitoring tree health to build more resilient Australian urban forests. (Esperon, Tjoelker, Medlyn) $9000.
2. *NSW Government* 2023 – 2027. NSW Bushfire and Natural Hazards Research Centre. (Boer, Gallagher, Nolan, Medlyn, James, Weir, Keith, Sharples, Price, Gill, Penman, Williamson, Yebra) $8,000,000.
3. *NSW Government*. 2022 – 2030. NSW Decarbonisation Innovation Hub, Land and Primary Industries Network. (Smith, Singh, Medlyn, Tjoelker) $4,500,000
4. *Bush Heritage Australia* and *Arid Zone Recovery*. 2022-2026. Predicting vegetation dynamics in Australia's arid zone. (Medlyn, Choat, Nolan) $40,000
5. *Country Fire Authority, Victoria.* 2021-2023. The Influence of Climate Change on Bushfire Fuels in Victoria. (Jiang, Boer, Nolan, Medlyn, Price, Smith) $310,000
6. *NSW Department of Planning, Environment and Industry*. 2021-2022. The re-greening of the Blue Mountains: using citizen science to study post-fire recovery in the Blue Mountains. (Medlyn + 9 co-CIs) $120,000
7. *NSW Environmental Trust*. 2021-2024. Determining the physiological underpinnings of eucalypt dieback in NSW. (Choat, Medlyn, Smith, Boer, Nolan, Tissue, Tjoelker, Pfautsch, Rymer, Roff) $198,707
8. *Australian Research Data Commons*. 2021-2023. AusTraits: a national database on the traits of Australia's complete flora. (Falster, Gallagher, Sauquet + 23 incl. Medlyn). $500,000
9. *Consultancy to AusGrid*. 2020. The Impact of Drought on Storm Damage Risk: factors contributing to damage to the AusGrid power grid in the 2019-2020 storm season. (Medlyn, Choat, Jiang) $22,000
10. *Herman Slade Foundation.* 2020-2023. Quantifying forest mortality after unprecedented drought and bushfires in Eastern Australia (Nolan, Medlyn, Choat, Boer, Griebel, Collins) $83,538
11. *Australian Research Council – Linkage*. 2020-2023. Forecasting live fuel moisture content, the on/off switch for forest fire. (Nolan, Yebra, Boer, Medlyn, Choat, Renzullo, van Dijk, Resco de Dios). $552,521. Partners: NSW Rural Fire Service; NSW Office of Environment and Heritage; Environment, Planning and Sustainable Development Directorate.

12. *Consultancy to CSIRO/TERN*. 2019-2020. Options for future Eddy-flux monitoring and SuperSite in Tumbarumba forests. (Raison, McKenzie-Harg, de Ligt, Roberts, Kirschbaum, Medlyn, Smith, Barton, McMurtrie).
13. *Australian Research Council – Georgina Sweet Laureate Fellowship.* 2019 – 2024. A unified dynamic vegetation model for Australia. $3,108,997.
14. *Royal Society International Exchange.* 2020 – 2021. Lianas in a CO_2-rich world (van der Heijden, Medlyn) £11,750
15. *NERC Large Grant (UK)* 2019-2024. QUINTUS: Quinquennial (half-decadal) carbon and nutrient dynamics in temperate forests (Lead, MacKenzie, Univ. Birmingham. Listed as project partner). £ 2.620 M
16. *NSW Office of Environment & Heritage Saving Our Species Program.* 2018-2021. Quantifying adaptive capacity to climate change through a multi-faceted approach: habitat suitability, functional traits, physiological tolerance and genetic adaptation (Rymer, Tissue, Medlyn, Choat, Beaumont, Gallagher, Rossetto, Bragg, Tierney, Auld, Denham, Tozer). $140,000
17. *Australian Research Council – Discovery*. 2018-2020. Brown is the new green: grassland responses to drought and heat (Medlyn, Power, Pendall, Tissue, Knapp, Smith). $485,949.
18. *NSW Dept of Environment & Heritage Enhanced Bushfire Research Hub* (2018-2022) (Bradstock, Boer, Keith, Bowman, Choat, Clarke, Dosseto, Johnston, Jenkins, Medlyn, Nolan, Pendall, Price, Murphy, Ooi, Tjoelker, Whittaker, Williamson) $3,925,000.
19. *Australian Research Council – Discovery*. 2016-2018. To grow or to store: do plants hedge their bets? (Medlyn, Duursma, Dewar, Williams). $428,000.
20. *Australian Research Council – Linkage*. 2014-2017. Identifying regions of high drought mortality risk for tree species in NSW. (Medlyn, Beaumont, Tissue, Auld, Evans, Duursma, Rymer, Tjoelker). $331,000. Partner: NSW Office of Environment and Heritage.
21. *Grapes & Wine Research & Development Corporation.* 2014-2017: Accurate and early yield predictions through advanced statistical modelling (van Sluyter, Medlyn) $356,000
22. *Agence Nationale de la Recherche (France).* 2014 – 2017. Modeling to accompany stakeholders towards adaptation of forestry and agroforestry systems to climate changes (Roupsard, Laclau, Nouvellon, Le Maire, Rapidel, Subervia, Loustau, Bosc, Trichet, Domec, Avelino, Duursma, Medlyn, Imbach, Maris, Garcia, Barrichelo) €969,028
23. *Australian Government – Science and Industry Endowment Fund*: *John Stocker Postdoctoral Fellowship.* 2013-2015. Building better climate change vegetation models: How do leaves allocate nitrogen among photosynthesis and stress proteins in future climate scenarios? (Westoby, Medlyn, Haynes, Tissue, Wang). $276,000.
24. *US Department of Energy.* 2013-2016. Model-Data Synthesis of Terrestrial Responses to Elevated CO_2. (Subcontract to Medlyn). US$140,000
25. *Australian Research Council - Discovery.* 2012 – 2014: Trading water for carbon: a synthesis of plant water-use efficiency from leaf to globe. (Medlyn, Prentice, Duursma, Arneth) $330,000
26. *Department of Agriculture, Fisheries and Forestry – Forest Industries Climate Change Research Fund.* 2010-2012. The Hawkesbury Forest Experiment: providing the missing information for decision support systems to manage forests under rising CO_2 and global

warming. (Ellsworth, Tissue, Adams, Anderson, Atkin, Barton, Cairney, Eamus, Linder, Medlyn, Riegler, Singh). $400,000.

27. *Australian Research Council - Discovery*. 2010 – 2012: Elevated CO_2 effects on vegetation: repairing the disconnect between experiments and models. (Medlyn, Leishman, Linder, Norby, Oren) $335,000
28. *Australian Research Council - Linkages.* 2009 – 2012. Forest ecosystem water use: does species diversity matter? (Ellsworth, Medlyn, Drewry, Morris) $302,500. Partner: Penrith Lakes.
29. *National Climate Change Adaptation Research Facility.* 2009. Forest vulnerability assessment: Scene setting and bio-physical impacts review. (Medlyn, Lyons) $104,500
30. *Australian Research Council - Discovery*. 2008-2010. How will Eucalypt tree architecture and growth adapt to future atmospheric CO_2 and drought? (Ellsworth, Medlyn, Katul, Ceulemans) $360,000
31. *New South Wales -- Department of Environment and Conservation.* 2007-2008. Trade-off between carbon sequestration in forests and water yields under rising CO_2. (Conroy, Ellsworth, Tissue, McMurtrie, Eamus, Montagu, Medlyn). $484,000.
32. *ARC Network for Earth System Science.* 2007. A user interface for the MAESTRA forest canopy model. $17,000
33. *Australian Greenhouse Office*. 2005-2008. The Hawkesbury Eucalypt Experiment: Impacts of Precipitation And CO_2 on Trees (IMPACT). (McMurtrie, Adams, Barton, Conroy, Eamus, Medlyn, Montagu) $1,500,000
34. *US National Science Foundation*. 2007-2010. Long-term Interactions among Water, CO2, and N in a Perennial Grassland Ecosystem (Reich, Ellsworth, Tilman, Knops, Hobbie, Zak, Naeem, Knops, Johnson, Venette, Medlyn) US$375,000
35. *US Department of Energy.* 2006. Model evaluation of root-soil interactions in ORNL FACE experiment. (McMurtrie, Medlyn) US$50,000
36. *US National Science Foundation*. 2004-2008. Long-term Interactions among Biodiversity, CO2, and N in a Perennial Grassland Ecosystem. (Reich, Ellsworth, Tilman, Knops, Hobbie, Zak, Naeem, Knops, Johnson, Venette, Medlyn) US$1,800,000
37. *ARC Post-doctoral Fellowship*. 2000-2004. Forests as Sinks or Sources of Carbon: Use of New Data Sets to Improve Model Estimates (Medlyn)

PUBLICATION LIST (ORCID 0000-0001-5728-9827)

Journal Articles

* Articles that are subjects of commentaries. Underlined first authors are students or post-docs under my supervision.

2023

1. Khanal S, Nolan RH, **Medlyn BE**, Boer MM (2023) Mapping soil organic carbon stocks in Nepal's forests. *Scientific Reports* 13:8090. https://doi.org/10.1038/s41598-023-34247-z
2. Jiao T, Williams CA, De Kauwe MG, **Medlyn BE** (2023). Limited evidence of cumulative effects from recurrent droughts in vegetation responses to Australia's Millennium Drought. *Journal of Geophysical Research: Biogeosciences,* 128, e2022JG006818. https://doi.org/10.1029/2022JG006818

2022

3. Griebel A, Boer M, Blackman C, Choat B, Ellsworth D, Madden P, **Medlyn BE**, Resco de Dios V, Wujeska-Klause A, Yebra M, Younes Cardenas N, Nolan R (2022) Specific leaf area and vapour pressure deficit control instantaneous live fuel moisture content. *Functional Ecology* 37:719– 731. https://doi.org/10.1111/1365-2435.14271
4. Losso A, Challis A, Gauthey A, Nolan RH, Hislop S, Roff A, Boer MM, Jiang M, **Medlyn BE**, Choat B (2022) Canopy dieback and recovery in Australian native forests following extreme drought. *Scientific Reports* 12:21608. https://doi.org/10.1038/s41598-022-24833-y
5. Yang J, **Medlyn BE**, Barton CVM, Churchill AC, De Kauwe MG, Jiang M, Krishnananthaselvan A, Tissue DT, Pendall E, Power SA (2022) Green-up and brown-down: modelling grassland foliage phenology responses to soil moisture availability. *Agricultural and Forest Meteorology* 328:109252. https://doi.org/10.1016/j.agrformet.2022.109252
6. Gardner A, Jiang M, Ellsworth D, MacKenzie AR, Pritchard J, Bader MK-F, Barton C, Bernacchi C, Calfapietra C, Crous KY, Dusenge ME, Gimeno TE, Hall M, Lamba S, Leuzinger S, Uddling J, Warren J, Wallin G, **Medlyn BE** (2022) Optimal stomatal theory predicts CO_2 responses of stomatal conductance in both gymnosperm and angiosperm trees. *New Phytologist* https://doi.org/10.1111/nph.18618
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181. **Medlyn BE** (1998) Physiological basis of the light use efficiency model. *Tree Physiology* 18:167-176

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183. **Medlyn BE** (1996a) Interactive effects of atmospheric carbon dioxide and leaf nitrogen concentration on canopy light use efficiency - a modelling analysis. *Tree Physiology* 16: 201-209.

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Book Chapters

1. Wang YP, McMurtrie RE, **Medlyn BE** and Pepper DA (2006). Modelling plant ecosystem responses to elevated CO2 at decadal to century timescales. In: "Plant Growth and Climate Change" Eds JIL Morison, MD Morecroft. Blackwell Publishing. Pp 165-186.
2. **Medlyn BE**, McMurtrie RE (2005) Effects of CO_2 on Plants at Different Timescales. In: "A History of Atmospheric CO_2 and Its Impacts on Plants, Animals, and Ecosystems" Eds. J Ehleringer, T Cerling, D Dearing. Springer-Verlag. pp441-467.
3. **Medlyn BE** (2004) A MAESTRO Retrospective. In: "Forests at the Land-Atmosphere Interface" Eds. M. Mencuccini, J.C. Grace, J. Moncrieff and K. McNaughton. CAB International. pp. 105-121.
4. **Medlyn BE**, Rey A, Barton CVM & Forstreuter M (2001). Above-ground growth responses of forest trees to elevated CO_2. In: "The Impact of Carbon Dioxide and Other Greenhouse Gases on Forest Ecosystems" Eds. D.F. Karnosky, G. Scarascia-Mugnozza, R. Ceulemans, and J. Innes. CABI Publishing, Wallingford, UK.

5. LeFèvre F, Laitat E, **Medlyn B**, Aubinet M & Longdoz B (2000) Carbon pools and annual carbon fluxes in the beech forest sub-plot at the Vielsalm pilot station. In: "Forest ecosystem modelling, upscaling and remote sensing". Eds. RJM Ceulemans, F Veroustraete, V Gond, JBHF van Rensbergen. SPB Academic Publ., The Hague, The Netherlands. pp 137-153.
6. **Medlyn BE** & Jarvis PG (1997) Integration of results from elevated CO_2 experiments on European forest species: the ECOCRAFT project. In: "Impacts of Global Change on Tree Physiology and Forest Ecosystems". Eds. GMJ Mohren, K Kramer, S Sabate. Kluwer Academic Publ., Dordrecht. pp 273 - 277.
7. Landsberg JJ, Jarvis PG, Prince S, McMurtrie RE, Luxmoore RJ & **Medlyn BE** (1996) Energy conversion and use in forests: an analysis of forest production in terms of radiation utilisation efficiency (ε). In: "The use of remote sensing in the modelling of forest productivity at scales from stand to globe". Eds. H.L. Gholz, K. Nakane, H. Shimoda. Kluwer Academic Publ., Dordrecht, The Netherlands, pp 273-298.

Other

1. Nolan RH, **Medlyn BE**, Choat B, Smith R (2020) Entire hillsides of trees turned brown this summer. Is it the start of ecosystem collapse? *The Conversation* 9/3/20 (Press article)
2. **Medlyn BE**, Choat B, De Kauwe MG (2019) Are more Aussie trees dying of drought? Scientists need your help spotting dead trees. *The Conversation* 27/3/19 (Press article)
3. Hartmann H, Schuldt B, Sanders TGM, Macinnis-Ng C, Boehmer HJ, Allen CD, Bolte A, Crowther TW, Hansen MC, **Medlyn BE**, Ruehr NK, Anderegg WRL (2018) Monitoring global tree mortality patterns and trends. Report from the VW symposium 'Crossing scales and disciplines to identify global trends of tree mortality as indicators of forest health'. *New Phytologist* 217: 984–987. (Meeting report)
4. Tjoelker MG, **Medlyn BE**, Drake JE (2017) Climate suitability of diverse provenances of a widely-distributed eucalypt: Testing the "local is best" paradigm under climate warming. *Australasian Plant Conservation* 26:7-9. (Non-peer-reviewed article)
5. **Medlyn BE**, De Kauwe MG, Duursma RA (2016) New developments in the effort to model ecosystems under water stress. *New Phytologist* 212:5-7 (Commentary)
6. Rogers A, **Medlyn BE**, Dukes JS (2014) Improving representation of photosynthesis in Earth System Models. *New Phytologist* 204: 12-14 (Meeting report)
7. **Medlyn B** & De Kauwe M (2013) Biogeochemistry: Carbon dioxide and water use in forests. *Nature* 499: 287-289 (News & Views article)
8. **Medlyn BE**, Zeppel M, Brouwers NC, Howard K, O'Gara E, Hardy G, Lyons T, Li L, Evans B (2011) Biophysical impacts of climate change on Australia's forests. Contribution of Work Package 2 to the Forest Vulnerability Assessment, Gold Coast, Australia, National Climate Change Adaptation Research Facility. Available at: http://www.nccarf.edu.au/node/149 (Peer-reviewed report)

TEACHING EXPERIENCE

Coursework

Western Sydney University (2015 -)
Lecturer:
2nd Year UG: Botany
Masters By Research: Fields of Research; Ecosystem Processes; Writing Beyond the Academy

Macquarie University (2007 – 2014)
Convenor:
Experimental Design & Data Analysis for Biology (2nd Year UG, 100 students)
Plants: Cells to Ecosystems (3rd Year UG, 30 students)
Lecturer:
1st Year: Evolution and Biodiversity
2nd Year: Climate Change, Plant Structure and Function, Global Climate Systems
3rd Year: Ecology and Evolution, Plant Diversity and Conservation

Pre-2007:
Lecturer, 3rd Year, Plant Ecosystem Processes, UNSW, 2005-06
Tutor, Maths I, UNSW, 1992-5
Tutor, Maths I, Univ. Adelaide, 1989

Research Students

Principal Supervisor:
Silvia Dezi (PhD, Co-tutelle, MQ & U Bologna) – 2010 *"Modelling the effects of nitrogen deposition and carbon dioxide enrichment on forest carbon balance"*
Ashehad Ali (PhD, MQ) – 2012 *"Modelling elevated carbon dioxide impacts on plant competition"*
Jeff Kelly (PhD, MQ) – 2013 *"Productivity and water use of Australian tree species under climate change"*
Sofia Baig (PhD, MQ) – 2014 "*Elevated [CO_2] effects on vegetation: Informing modelling through meta-analysis and targeted experiments"*
Jinyan Yang (PhD, WSU) – 2019 "*Modelling carbon uptake of Australian evergreen ecosystems under rising CO_2 concentration and water limitation*"
Dushan Kumarathunge (PhD, WSU) – 2019 "*Predicting the effect of temperature on tree growth"*
Elisa Stefaniak (PhD, WSU) – 2022 "*Modelling optimal plant carbon storage*"
Arjunan Krishnananthaselvan (PhD, WSU) – 2023 "*Measuring and modelling responses of Australian grasses to drought*"
Min Zhao (PhD, WSU) – current
Aaranya Sekaran (PhD, WSU) – current
Sonam Dhargay (PhD, WSU) - current
Camille Sicangco (Fulbright Scholar) 2022-3
Krish Singh (MRes, WSU) - current

Co-supervisor:
Termeh Hezareh (M Sc, UNSW) – 2008 "*The use of forest models to understand effects of elevated CO_2 on aboveground forest productivity*"
Rhys Whitley (PhD, UTS) – 2010 "*Modelling water and carbon canopy fluxes*"
Yan-Shih Lin (PhD, UWS) – 2012 "*How will Eucalyptus tree species respond to global climate change?: A comparison of temperature responses of photosynthesis*"

Juliet Suich (M Sc, MQ) - 2012 "*Ecophysiological analysis of cultivated rice and Australian wild Oryza*"
Shuangxi Zhou (PhD, MQ) – 2014 "*Quantifying and modelling the responses of leaf gas exchange to drought*"
Douglas Kelley (PhD, MQ) – 2014 "*Modelling Australian fire regimes*"
Courtney Campany (PhD, UWS) – 2016 *"Resource allocation in Eucalyptus"*
Yaojie Lu (PhD, UWS) – 2017 "*Optimal and competitive stomatal behaviour"*
Alexis Renchon (PhD, WSU) – 2019 *"Constraints on ecosystem carbon and water flux estimates in a temperate Australian evergreen forest"*
Candy Theerasutthikul (M. Res., WSU) – 2019 "*Investigating the main and interactive effects of vapour pressure deficit, soil water deficit, warmer temperatures and elevated CO_2 on cotton growth and physiology*"
Ximeng Li (PhD, WSU) – 2020 *"Hydraulic traits and drought mortality risk of tree species"*
Zineb Choury (PhD, WSU) – 2021 "*Determining the acclimation capacity of Australian rainforest trees growing in warm and cool climates*"
Alice Gauthey (PhD, WSU) – 2021 *"Non-invasive imaging of drought-induced cavitation in plants"*
Vinod Jacob (PhD, WSU) – 2022 "*Gas exchange and hydraulic strategies of pasture species under climate change*"
Shiva Khanal (PhD, WSU) – 2023 "*Objective quantification of Nepal's forest carbon stocks in support of the REDD+ Programme*"
Victoria Perez Martinez (PhD, WSU) – current
Klaske van Wijngaarden (PhD, co-tutelle, WSU & U Birmingham) – current
Nuwanthi Arampola (PhD, co-tutelle, WSU & Lund U) – current
Ellie Nichols (PhD, WSU) - current

International PhD Committees:
Juergen Knauer (Max-Planck Institute, Jena, Germany) – completed 2018
Tong Jiao (Clark University, USA) – completed 2020