

Technical University of Munich
TUM School of Life Sciences Weihenstephan
Land Surface-Atmosphere Interactions

Anja Rammig

Christian Zang

Phillip Papastefanou

Technical University of Munich

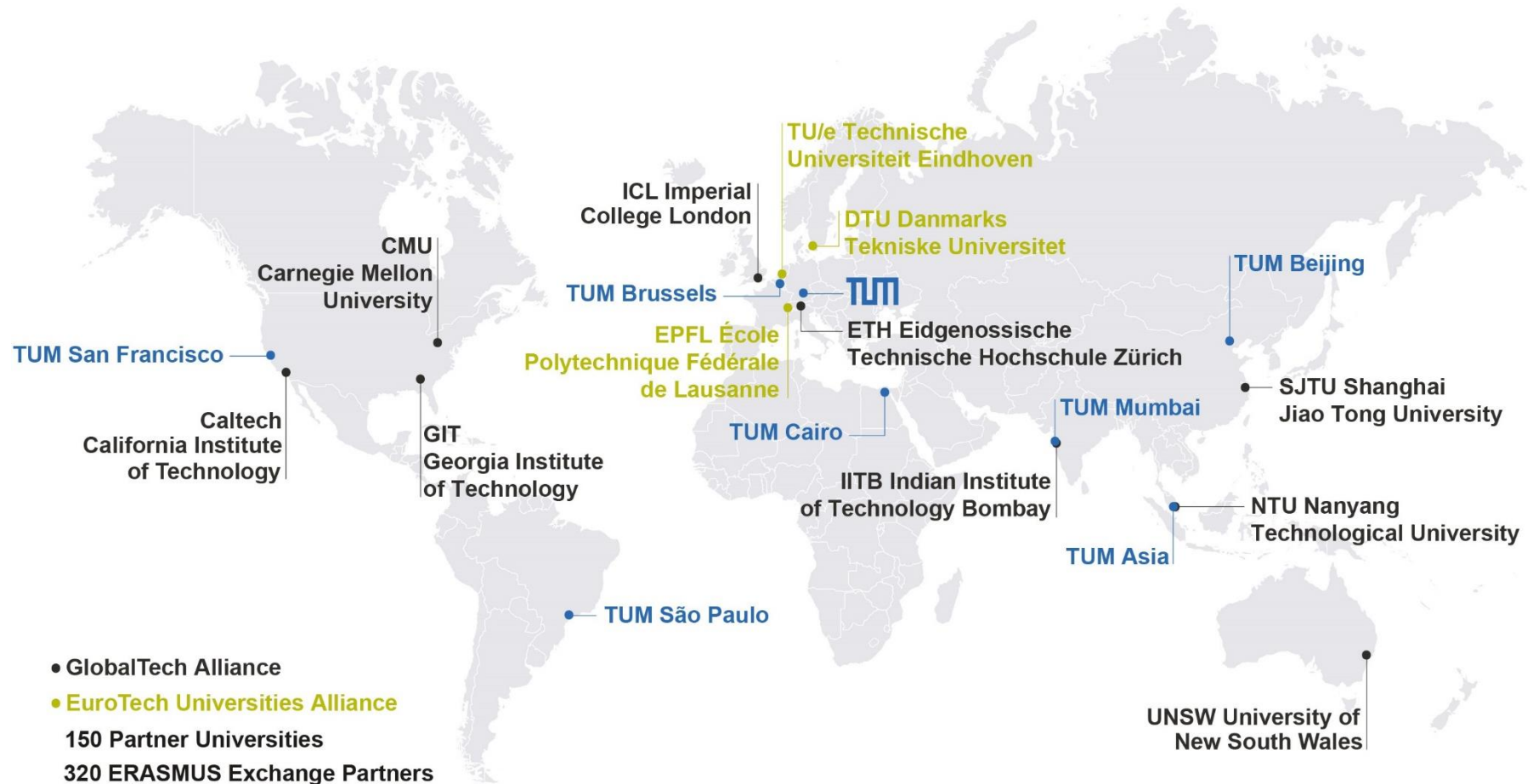
Key Data

- Founded in 1868
- Elected “University of Excellence”
- 150 Partner Universities
- 320 ERASMUS Exchange Partners



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Global



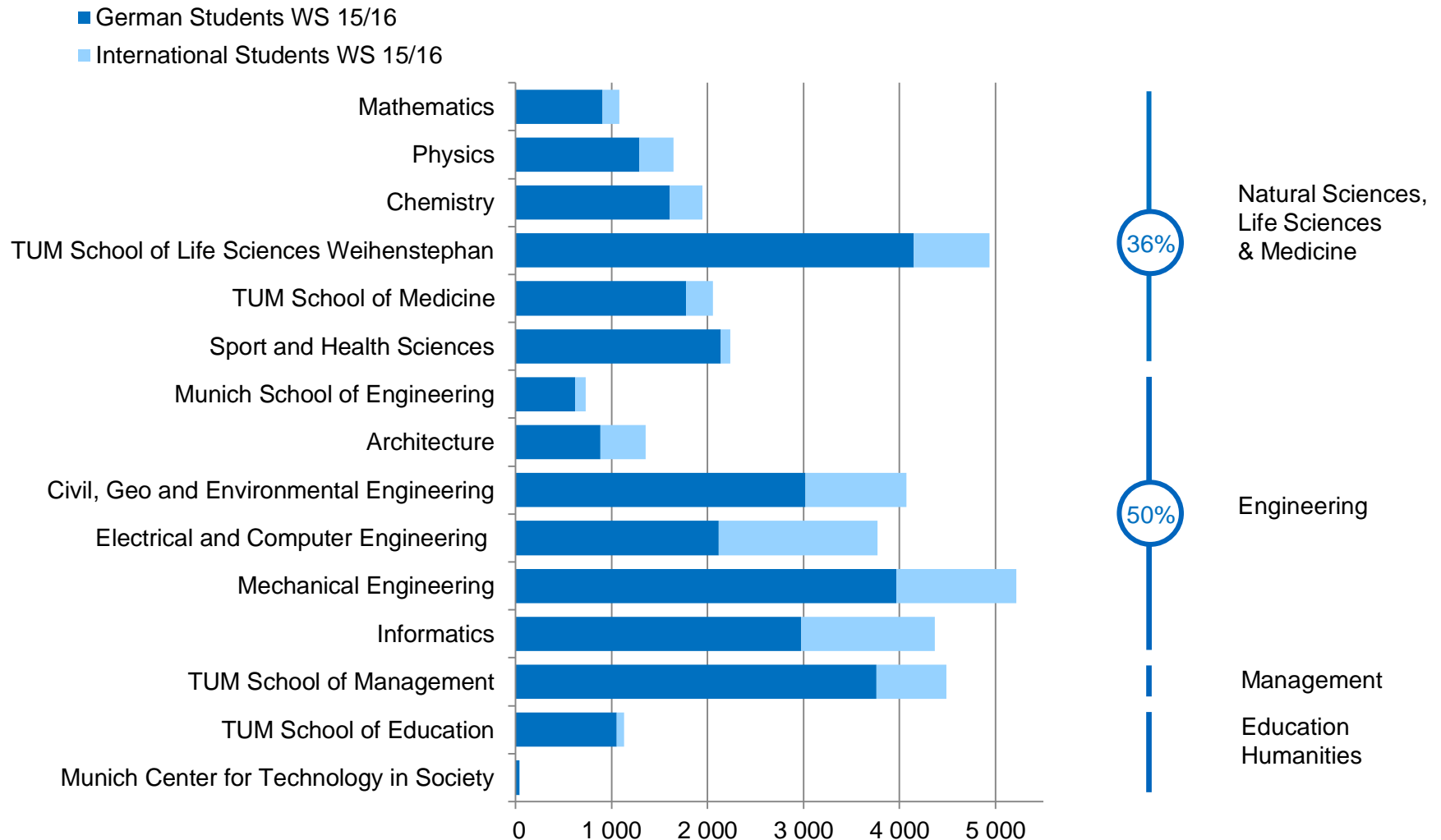
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Key Data

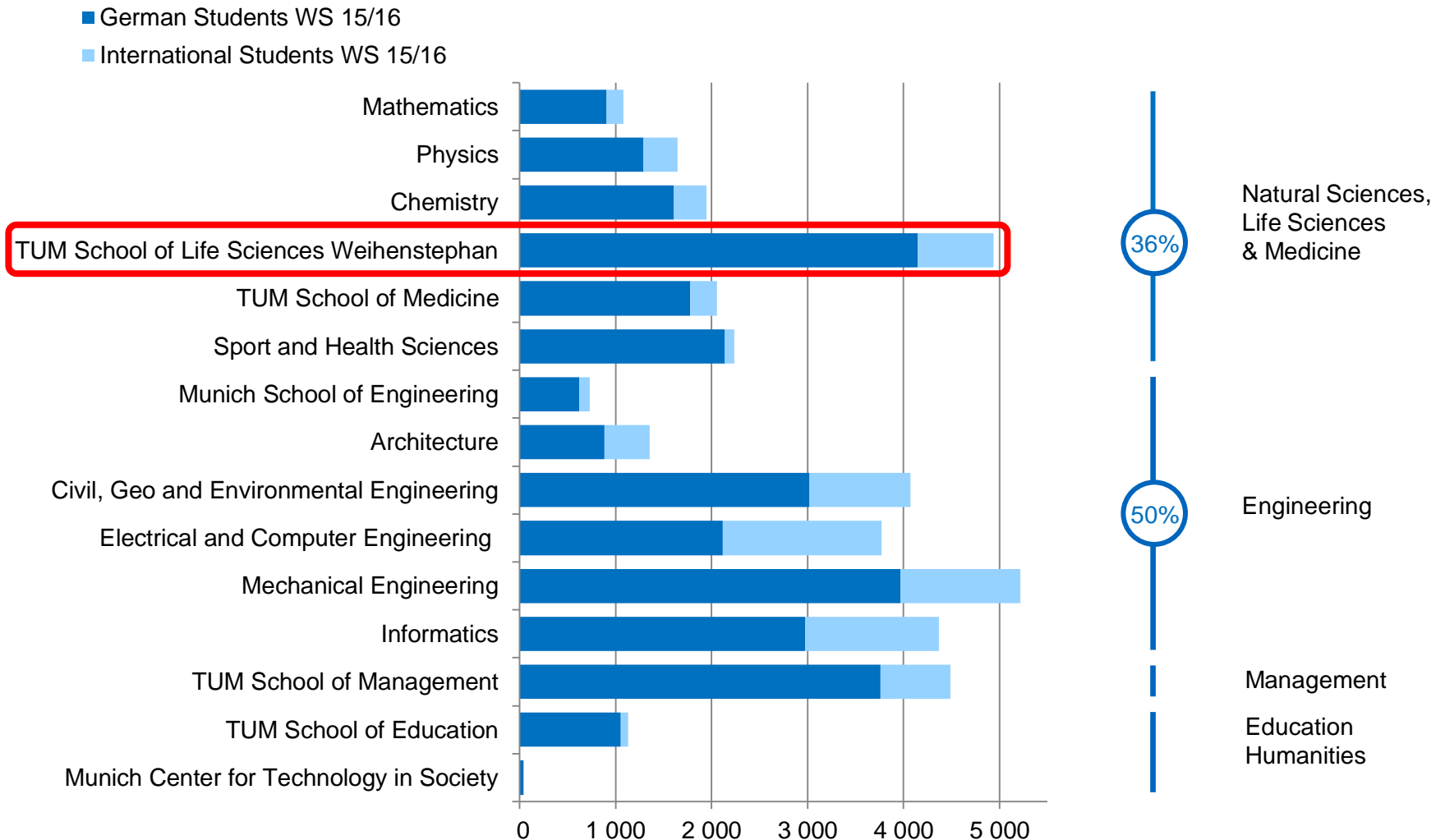
- 13 Departments
- 528 Professors (incl. hospital)
- ~ 5 800 Publications, peer-reviewed per year
- 39 000 Students, 34% female, 22% Internat'l
- 165 Degree Courses



Technical University of Munich



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School of Life Sciences Weihenstephan

- Located 40 km northeast of Munich



Research Group: Land Surface-Atmosphere Interactions

Anja Rammig



Tenure Track Assistant Professor since June 2015
PhD in Environmental Sciences at ETH Zurich
2008-2015 at Potsdam Institute for Climate Impact
Research (PIK, with Kirsten Thonicke)

Research Group: Land Surface-Atmosphere Interactions

Anja Rammig



Christian Zang



Research Assistant since Jan 2016

PhD thesis (2011) on tree growth response to drought events
at Hochschule Weihenstephan-Triesdorf & TUM

Expertise: Tree ring analysis, modelling

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Christian Zang



Phillip Papastefanou



PhD student since October 2016
2014-2016 developing the *LepiX* model for the FAfNC
Also focus on the interface of modelling and communication

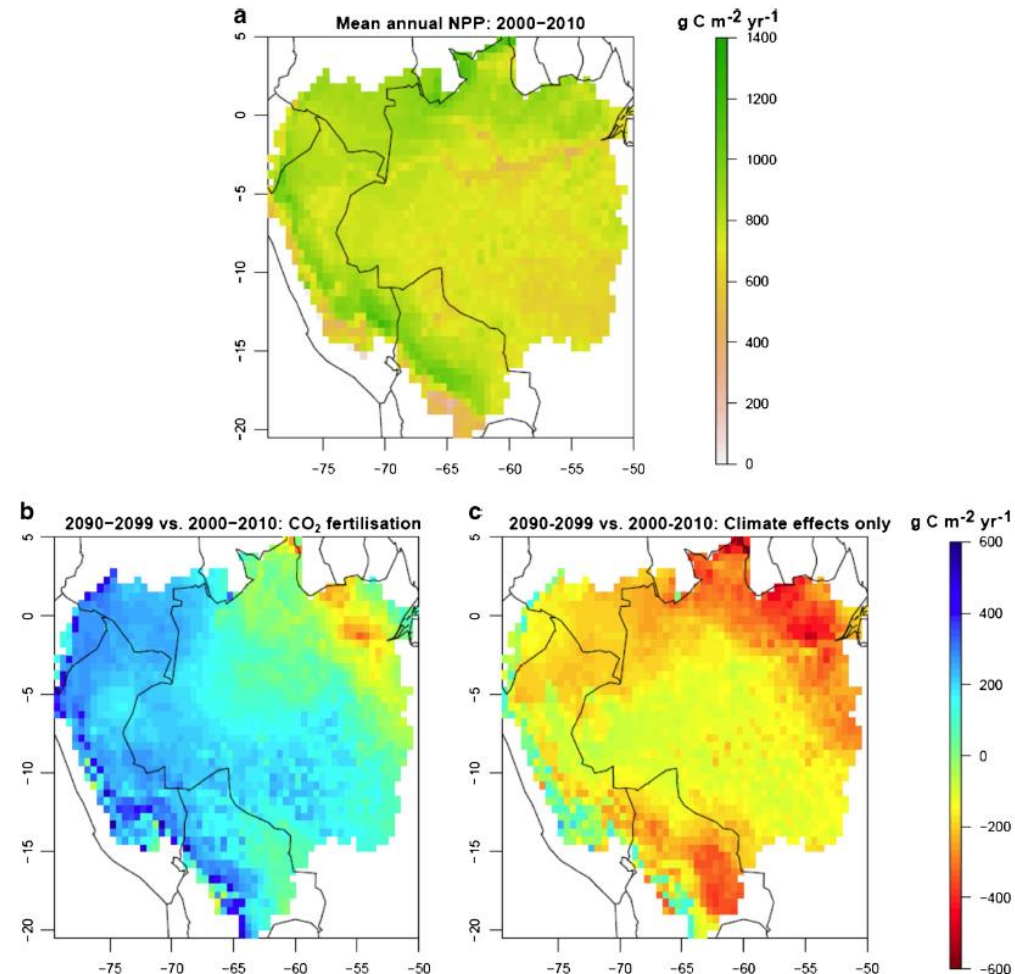
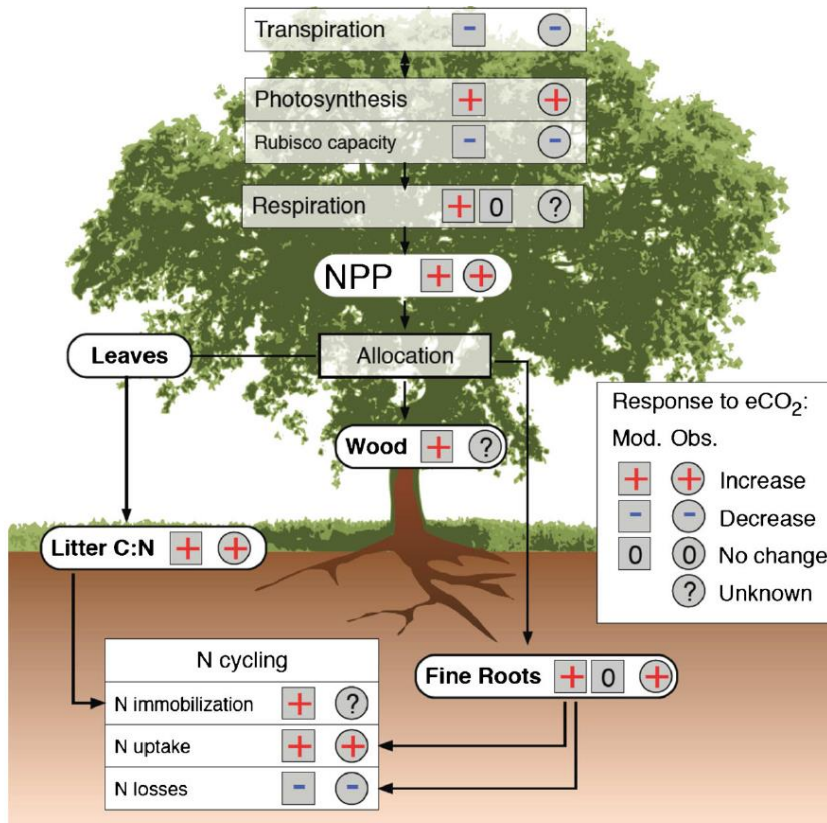
Research Group: Land Surface-Atmosphere Interactions

Previous and present research

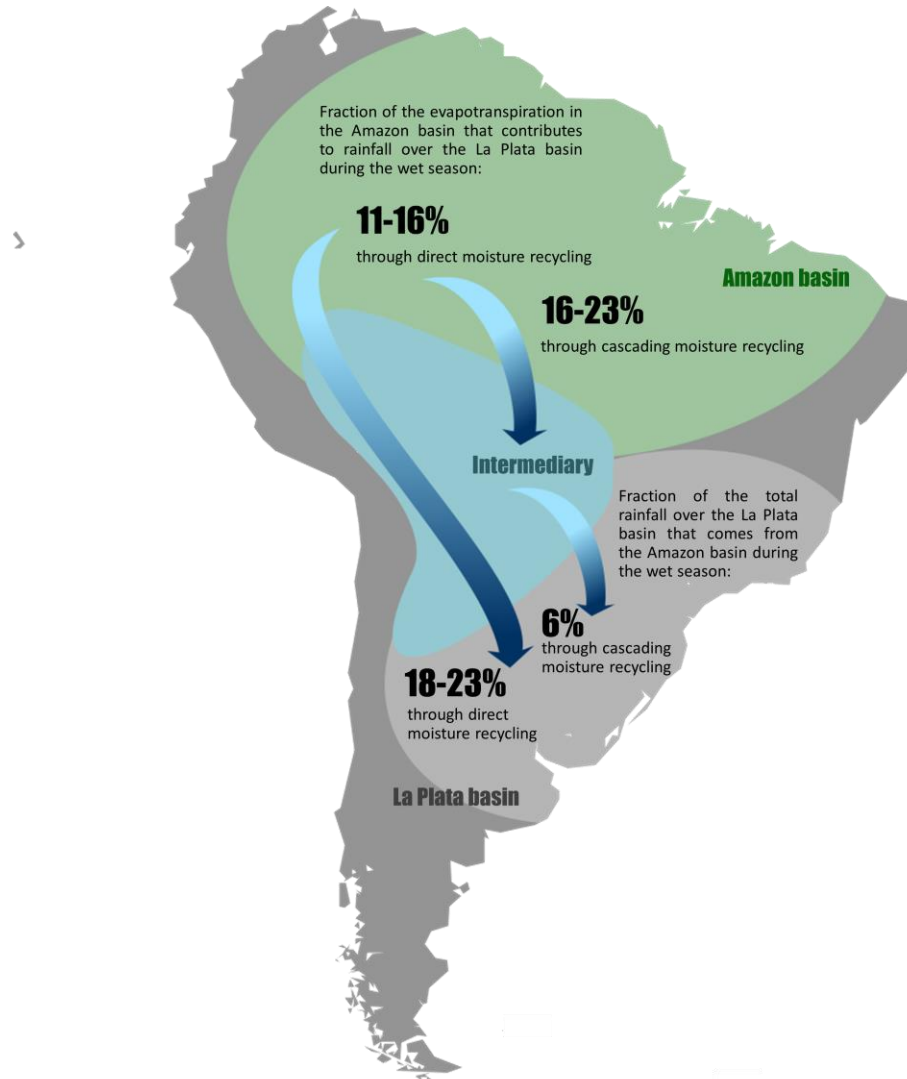
- Research on impacts of climate and land-use change in tropical rainforests
- Effects of increasing atmospheric CO₂ concentrations on forest ecosystems physiology and dynamics
- Extreme events in the biosphere
- Key areas of expertise: Dynamic vegetation modelling (LPJ), statistical data analysis



Effects of elevated atmospheric CO₂ concentration on the biosphere are highly uncertain



Tropical rainforests play an important role in the climate system by cascading moisture recycling



Extreme climate events have strong impacts on forest ecosystems and may lead to a tipping point

100 YEARS **Journal of Ecology**



Journal of Ecology 2015, **103**, 5–15

doi: 10.1111/1365-2745.12337

SPECIAL FEATURE – ESSAY REVIEW

FOREST RESILIENCE, TIPPING POINTS AND GLOBAL CHANGE PROCESSES

Forest resilience and tipping points at different spatio-temporal scales: approaches and challenges

Christopher P. O. Reyer^{1*}, Niels Brouwers², Anja Rammig¹, Barry W. Brook³, Jackie Epila⁴, Robert F. Grant⁵, Milena Holmgren⁶, Fanny Langerwisch¹, Sebastian Leuzinger⁷, Wolfgang Lucht^{1,8}, Belinda Medlyn⁹, Marion Pfeifer¹⁰, Jörg Steinkamp^{11,12}, Mark C. Vanderwel¹³, Hans Verbeeck⁴ and Dora M. Vilella¹⁴

A probabilistic risk assessment for the vulnerability of the European carbon cycle to weather extremes: the ecosystem perspective

S. Rolinski¹, A. Rammig¹, A. Walz², W. von Bloh¹, M. van Oijen³, and K. Thonicke¹

Global Change Biology (2012), doi: 10.1111/gcb.12023

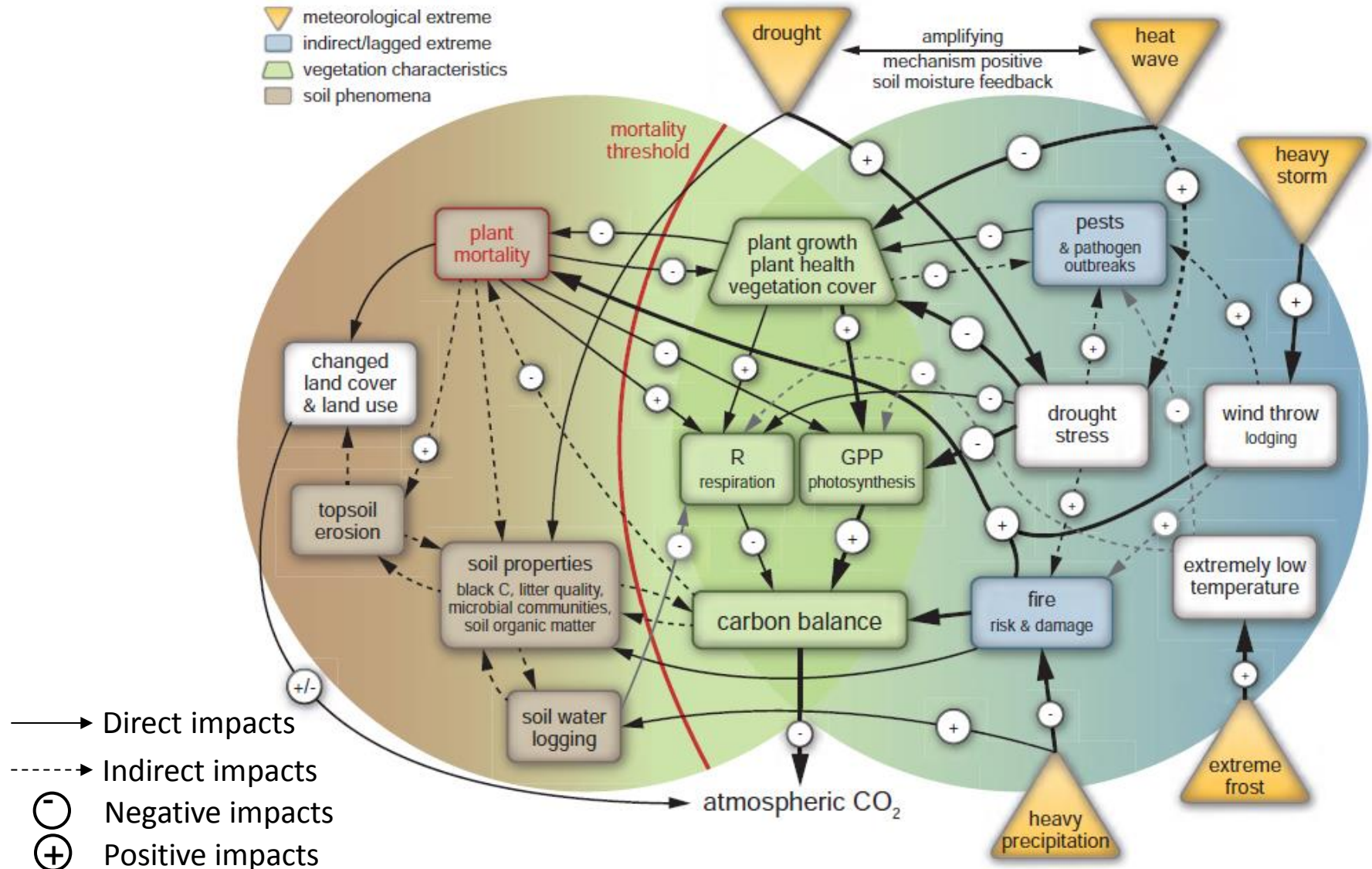
imate Impact Research, Telegraphenberg, PO Box 60 12 03, 14412 Potsdam, Germany
rl-Liebknecht-Str. 24–25, 14476 Potsdam-Golm, Germany
ydrology Edinburgh, Bush Estate, Penicuik, Midlothian, EH26 0QB, UK

REVIEW

A plant's perspective of extremes: terrestrial plant responses to changing climatic variability

CHRISTOPHER P.O. REYER*, SEBASTIAN LEUZINGER†‡§, ANJA RAMMIG*, ANNETT WOLF‡, RUUD P. BARTHOLOMEUS¶, ANTONELLO BONFANTE||, FRANCESCA DE LORENZI||, MARIE DURY**, PHILIPP GLONING††, RENÉE ABOU JAOUDE‡‡, TAMIR KLEIN§§, THOMAS M. KUSTER‡,¶¶, MONICA MARTINS|||, GEORG NIEDRIST***,†††, MARIA RICCARDI||, GEORG WOHLFAHRT†††, PAOLO DE ANGELIS‡‡, GIOVANBATTISTA DE DATO‡‡, LOUIS FRANÇOIS**, ANNETTE MENZEL†† and MARÍZIA PEREIRA‡‡‡

The impacts of extreme climate events on the carbon cycle cause direct and lagged responses



TUM tasks in CLIMAX

Overview

My PhD thesis:

- Investigate effects of climate extremes on the carbon and water cycle in South America
- Evaluate drought-induced changes in water conductivity (in tropical trees)
- Implement hydraulic plant characteristics influencing the water flow within plants in the dynamic vegetation model LPJ-GUESS
- Analyze changes in evapotranspiration rates and moisture recycling involving impacts of climate change, extreme droughts, land-use change/fragmentation

Further tasks:

- **WP1** co-lead with Kirsten Thonicke
- Contribution to co-production cycles for the case studies by providing simulation results related to moisture supply from forests and moisture transport, in collaboration with PIK (**WP0.T2**)

Thank you for your attention!