

PERSONAL INFORMATION



Antonio Trabucco

Research scientist (Permanent Position) at Euro-Mediterranean Centre for Climate Change (CMCC),
Impacts on Agriculture, Forests and Ecosystem Services division,

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National Academic Qualification (Abilitazione Nazionale MIUR) as Professore Associato
for sector 07/B2 (Scienze e Tecnologie dei Sistemi Arborei e Forestali)

RESEARCH INTERESTS

My thematic qualifications cover widely relationships between vegetation/ecosystems and climate (from regional to global scale), ecosystem services and their alteration due to climate and global drivers linked to land use, policy and economic development scenarios. I have been heavily engaged in the development of several global climate datasets (PET, Soil Water Budget, Aridity Index), from which I have expanded collaborations with several research groups analyzing climate change impact on several environmental aspects related to ecosystem distribution and production, species distribution, vegetation functioning, crop yields. I am currently involved at CMCC with large data coupling processes and climate services modelling of interactions between climate, vegetation (crop productivity and ecosystem services) and sustainable development goals.

WORK EXPERIENCE

Sep 2011 – Present

Research scientist at Euro-Mediterranean Centre on Climate Change (CMCC), Impacts on Agriculture, Forests and Ecosystem Services division, **Italy**

- Modelling water requirements for agricultural, domestic and touristic sectors. Simulation of Food / Water / Energy Nexus interlinkages and conflicts in Mediterranean areas under climate change and socio-economic scenarios – SIM4NEXUS project (H2020)
- Land suitability of hazelnut cultivation in Australia, and climate indicators for productivity risks under climate change – Consultancy for Ferrero S.P.A.
- Monitoring agroecology and adaptive capacity assessment in the Pamirs (Central Asia) – Principal Investigator ECCAP project (Belmont Forum)
- Development of GIS platforms coupled with crop models to elaborate short and long term predictions of climate change impact on crop yields and crop water requirements over Euro-Mediterranean and Africa – CLIMAFRICA project (FP7)
- Climate Change impact on Drought Water and Coast / Pilot studies in Italy (Puglia and Trentino) and Greece (Attica) - WP Coordinator ORIENTGATE Project (SEE Programme)
- Effects of climate change on the tourism and agricultural sectors in the Mediterranean – WASSERMED project (FP7)
- Development of drought indicators in the Euro-Mediterranean for assessment of impact on climate services, and their elaboration into policy advises and adaptation plans.
- Climate change impact on agriculture, elaboration of adaptation guidelines and demonstration of water efficient agronomic practices across North Africa (Egypt, Tunisia and Morocco) – CMCC project manager in the ACLIMAS project (SWIM Programme)
- Delineation of food security & nutritional adequacy, based on climate change, impact on crop yields and demography in Nigeria – World Bank tender

Dec 2012 – Dec 2015

Academic Staff at Division of Forest, Nature and Landscape, University of Leuven, **Belgium**

- Paleoclimate modeling and historical dynamics of forest productivity in Sagalassos archaeological site (Turkey)
- Jatropha biofuel crops: Global trade-offs between climate change mitigation, food and energy security.

- Feb 2013 – Dec 2013 Research Consultant at World Agroforestry Centre (ICRAF), East Asia Node Centre for Mountain Ecosystem Studies, Kunming Institute of Botany, **China**
- Environmental stratification for monitoring ecosystem services over Asian highlands and their trends due to climate change
 - Eco-hydrology over Asian highlands and trends due to climate change
- Oct 2010 – Dec 2010 Research Consultant at International Centre for Integrated Mountain Development, **Nepal**
- Environmental stratification and climate change trends of ecosystems distribution in Kailash Sacred Landscape for long term monitoring of biodiversity and ecosystem services.
- Jan 2007 – Jun 2008 Research Assistant at World Agroforestry Centre, Nairobi, **Kenya**
- Geospatial framework quantifying global agroforestry extent, highlighting existing and potentially achievable levels of tree inclusion over rural landscape, given biophysical limits defined by demography and climate.
 - Identification of correspondences and relationships between tree cover, socio-economic and climate within different geographical rural areas.
- Sep 2004 – Oct 2006 Research Assistant and technical coordinator for the Consortium of Spatial Information of CGIAR (CSI-CGIAR) at International Water Management Institute (IWMI), **Sri Lanka**
- Development of global bioclimate and soil-water geo-datasets.
 - Global land suitability assessment and hydrological impact of reforestation projects under CDM-AR guidelines
 - Analysis of poplar agroforestry extent and its hydrological impact in India.
- Nov 2001- Jun 2004 GIS Lab manager at Organization for Tropical Studies (OTS), La Selva Biolog Station, **Costa Rica**
- GIS/RS database management and geospatial analyses to promote and support GIS and Remote Sensing for biological research activities, environmental management planning and preservation.
- Sep 1999 - Jun 2001 Undergraduate Researcher at Center for Space Technologies and Remote Sensing, UC Davis, **USA**
- Eco-hydrological modelling to evaluate responses to land use changes.
 - Field work specialist and remote sensing analyst of hyperspectral imageries to determine forest structure, composition and vegetation stress levels

EDUCATION AND TRAINING

- Jan 2008 - Dec 2012 PhD in Bioscience engineering at Catholic University of Leuven, **Belgium**
Thesis: 'Land Use, Land Use Change and Forestry activities for Climate Change Mitigation'
- Sep 1991 - Feb 2003 Laurea in Scienze Forestali at Padua University, **Italy**
Thesis: 'Parameterization of an eco-hydrological model: analyses and problems'
- Sep 1997 – Aug 1998 Exchange Student at Department of Land, Air and Water Resources, University of California at Davis, **USA**
- Jan 1996 – July 1996 Erasmus student at Departments of Geography and Forestry, Wageningen Agricultural University, **Netherlands**

AWARDS and GRANTS

- 2018 International Food Policy Research Institute - 2018 CGIAR-CSI Mini Grant – Global Geospatial PET and Aridity Index Database V2 (PI) – 10 000 Euros
- 2017 Ferrero – Suitability of hazelnut cultivation in Australia (PI) - 30 300 Euros
- 2017 CNR-DTA (BELMONT FORUM) – Ecological Calendars and Climate Adaptation in the Pamirs (PI) - 80 000 Euros
- 2008 KU Leuven advanced Research Grant– PhD scholarship – 60 000 Euros
- 2007 International Water Management Institute - PhD scholarship – 15 000 US\$
- 2006 International Water Management Institute - 2006 best paper award
- 1997 Fondazione Gini, Padova – exchange student scholarship - 3 000 Euros

Databases

CRU TS 2.1 Global Climate Database: Reformatted for GIS Spatial Analysis:
<http://csi.cgiar.org/cru>

GLOBAL-PET and GLOBAL-ARIDITY GeoSpatial Database:
<http://csi.cgiar.org/aridity>

Global High-Resolution Soil-Water Balance:
<https://cgiarcsi.community/data/global-high-resolution-soil-water-balance/>

PERSONAL SKILLS

Mother tongue(s)

Italian

Other language(s)

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C2	C2	C2	C1	C2
Spanish	C1	B2	C1	B1	B1
French	B2	B1	B1	B1	B1

Communication and networking skills

Through several research positions based in Americas, Africa, Asia and Europe, I managed and experienced many commitments, interactions, communications and presentations in coordination with many culturally diverse working groups. To be effective, scientific research requires interaction and a capacity to identify and enforce collaborations. Outcomes of my scientific research witness a large network of collaborations and co-authorships with partners from many international institutions. As CSI-CGIAR technical coordinator, I was in charge of effective communication and involvement within a large network of CGIAR offices worldwide.

Organisational / managerial skills

Supervision and Scientific Coordination of WP activities and tasks within International research projects with several partners in Europe, North America, Asia and North Africa. As GIS lab manager at La Selva Biological Station and as technical coordinator for the Consortium of Spatial Information of the CGIAR, I coordinated research efforts and organized/shared dissemination of large databases and initiatives through on-line platform among scientists and stakeholders communities.

Job-related skills

Research methodologies over several fields of forestry, crop science, hydrology, ecology, climatology, with modelling analyses implemented & performed over many GIS platforms at regional/global scale:

- Development, application and distribution of bioclimate geo-datasets at continental/global scale for soil-climate-plant studies (e.g. PET, Soil-Water budget, drought indicators).
- Agro-ecological zoning, land suitability and bioclimate stratification evaluating vegetation (crop, forest and ecosystem) suitability in relation to several environmental/social factors.
- Eco-hydrological model to evaluate hydrological responses to land use changes.
- Environmental stratification for ecosystem services monitoring
- Development of GIS modelling platform to elaborate spatial crop model simulation associated to large GCM / RCM long-term and seasonal climate data projections.
- Projections of changes in crop water uses and irrigation requirements.
- Species bio-geographical distribution modelling, and their shift due to climate change
- Food security and nutritional adequacy based on climate change, impact/adaptation on crop yields and demography.
- Identification of correspondences and relationships between natural resources, population demography and climate within different geographical rural areas.
- System Dynamic Modelling of interlinkages and feedback of Climate-Food-Water Nexus

Computer skills Administrative level skills for Windows/Linux/Unix OS. Long research experience (almost 20 yrs) implementing computer applications for geo-environmental analyses, using several GIS software (ArcGIS DeskTop, ARCINFO workstation, Envi, Erdas, Idrisi), statistical software (SPSS, IDL, R) and computer languages (AML, Avenue, IDL, R, Python, C and VB).

Publications Kantola T, Tracy JL, Lyytikäinen-Saarenmaa P, Saarenmaa H, Coulson RN, Trabucco A, Holopainen M (2019) **Hemlock woolly adelgid niche models from the invasive eastern North American range with projections to native ranges and future climates.** *iForest - Biogeosciences For.*, 12(2), 149–159.

H-index = 17

Total number of citations = 1506

Jha PK, Athanasiadis P, Gualdi S, **Trabucco A**, Mereu V, Shelia V, Hoogenboom G (2019) **Using daily data from seasonal forecasts in dynamic crop models for yield prediction: A case study for rice in Nepal's Terai.** *Agricultural and Forest Meteorology*, 265, 349-358.

Tracy JL, **Trabucco A**, Lawing AM, Giermakowski JT, Tchakerian M, Drus GM, Coulson RN (2018) **Random Subset Feature Selection for Ecological Niche Models of Wildfire Activity in Western North America.** *Ecological Modelling*, 383, 52-68.

Masia S, Sušnik J, Marras S, Mereu S, Spano D, **Trabucco A** (2018) **Assessment of irrigated agriculture vulnerability under climate change in Southern Italy.** *Water*, 10(2), 209.

Sušnik J, Chew C, Domingo X, Mereu S, **Trabucco A**, Evans B, Vamvakeridou-Lyroudia L, Savić DA, Laspidou C, Brouwer F (2018) **Multi-stakeholder development of a serious game to explore the water-energy-food-land-climate nexus: the SIM4NEXUS approach.** *Water*, 10(2), 139.

Jha PK, Athanasiadis P, Gualdi S, **Trabucco A**, Mereu V, Hoogenboom G, Shelia V (2018) **Evaluating the applicability of using daily forecasts from Seasonal Prediction Systems (SPSs) for agriculture: A case study of Nepal's Terai with the NCEP CFSv2.** *Theoretical and Applied Climatology*.

Kassam KA, Ruelle ML, Samimi C, **Trabucco A**, Xu J (2018) **Anticipating Climatic Variability: The Potential of Ecological Calendars.** *Human Ecology*, 46(2), 249-257.

Ronco P, Zennaro F, Torresan S, Critto A, Santini M, **Trabucco A**, Zollo A, Galluccio G, Marcomini A (2017) **A risk assessment framework for irrigated agriculture under climate change: the case of Puglia Region (Italy).** *Advances in Water Resources*, 110, 562-578.

Soteriades AD, Murray-Rust D, Trabucco A and Metzger MJ (2017) **Understanding global climate change scenarios through bioclimate stratification.** *Environmental Research Letters*, 12, 084002.

Costa-Saura JM, **Trabucco A**, Spano D, Mereu S (2017) **Environmental filtering drives community specific leaf area in Spanish forests and predicts relevant changes under future climatic conditions.** *Forest Ecology and Management*, 405, 1-8

Di Paola A, Paquette A, Trabucco A, Mereu S, Valentini R, Paparella F (2017) **Coexistence trend contingent to Mediterranean oaks with different leaf habits.** *Ecology and Evolution*, 7(9) 3006-3015.

Masia S, Sušnik J, Mereu S, Spano D, Marras S, Blanco M, **Trabucco A** (2017) **Water-Food-Energy nexus and climate change for multipurpose reservoirs in Sardinia.** Dresden NEXUS Conference

Moncrieff GR, Scheiter S, Langan L, **Trabucco A**, Higgins SI (2016) **The future distribution of the savannah biome: model-based and biogeographic contingency.** *Philos Trans. R Soc. London B Biol. Sci.*, 371(1703).

Zomer R, Neufeldt H, Xu J, Ahrends A, Bossio D, **Trabucco A**, van Noordwijk M, Wang M (2016) **Global Tree Cover and Biomass Carbon on Agricultural Land: The contribution of agroforestry to global and national carbon budgets.** *Scientific Reports*, 6:29987.

Costa-Saura JM, Martínez-Vilalta J, **Trabucco A**, Spano D, Mereu S (2016) **Specific leaf area and hydraulic traits explain niche segregation along an aridity gradient in Mediterranean woody species.** *Perspectives in Plant Ecology, Evolution and Systematics*, 21, 23–30.

Mereu S, Susnik J, **Trabucco A**, Daccache A, Vamvakeridou-Lyroudia L, Renoldi S, Virdis A, Savić D, Assimakopoulos D (2016) **Operational resilience of reservoirs to climate change, agricultural demand, and tourism: a case study from Sardinia.** *Science of the Total Environment*, 543, 1028-1038.

Zomer RJ, **Trabucco A**, Wang M, Xu JC (2016) **Projected Climate Change Impact on Hydrology, Bioclimatic Conditions, and Terrestrial Ecosystems in the Asian Highlands.** ICRAF Working Paper 222. World Agroforestry Centre East and Central Asia, Kunming, China.

Zomer R, Xu J, Wang M, **Trabucco A**, Li Z (2015) **Projected Impact of Climate Change on the Effectiveness of the Existing Protected Area Network for Biodiversity Conservation within Yunnan Province, China.** *Biological Conservation*, 184, 335-345.

Achten WMJ, Dillen K, **Trabucco A**, Verbist B, Messemaker L, Muys B, Mathijs E (2015) **The economics and greenhouse gas balance of land conversion to *Jatropha*: the case of Tanzania.** *Global Change Biology & Bioenergy*, 7(2), 302-315.

Trabucco A, Zomer R (2014). **Influence of Aridity on Vegetation.** In K. Sebastian (Ed.), Atlas of African Agriculture Research & Development.

Zomer RJ, **Trabucco A**, Metzger M, Wang M, Oli KP, Xu J (2014) **Projected climate change impacts on spatial distribution of bioclimate zones and ecoregions within the Kailash Sacred Landscape of China, India, Nepal.** *Climatic Change*, 125, 445-460.

Kint V, Aertsen W, Fyllas NM, **Trabucco A**, Janssen E, Özkan K, Muys B (2014) **Ecological traits of Mediterranean**

- tree species as a basis for modeling forest dynamics in the Taurus mountains, Turkey. *Ecological Modeling*, 286, 53-65.
- Wagner F, Rossi V, Aubry-Kientz M, Bonal D, Dalitz H, Gliniars R, Stahl C, **Trabucco A**, Hérault B (2014) **Pan-tropical analysis of climate effects on seasonal tree growth**. *PLoS ONE*, 9(3): e92337.
- Zomer RJ, **Trabucco A**, Coe R, Place F, van Noordwijk M, Xu JC (2014) **Trees on farms: an update and reanalysis of agroforestry's global extent and socio-ecological characteristics**. ICRAF Working Paper 179. World Agroforestry Centre (ICRAF) Southeast Asia Regional Program, Bogor, Indonesia.
- De Cauwer V, Muys B, Revermann R, **Trabucco A** (2014) **Potential, realised, future distribution and environmental suitability for *Pterocarpus angolensis* DC in southern Africa**. *Forest Ecology and Management*, 315, 211-226.
- Zomer R, **Trabucco A**, Wang M, Lang Rong, Chen H, Metzger M, Smajgl Alex, Beckschaefer P, Xu J (2014) **Environmental stratification to model climate change impacts on biodiversity and rubber production in Xishuangbanna, Yunnan, China**. *Biological Conservation*, 170, 264-273.
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- Metzger MJ, Brus DJ, Bunce RGH, Carey PD, Gonçalves J, Honrado JP, Jongman RHG, **Trabucco A**, Zomer R (2013) **Environmental stratifications as the basis for national, European and global ecological monitoring**. *Ecological Indicators*, 33, 26-35.
- Zomer RJ, **Trabucco A**, Metzger M, Oli KP (2013) **KSL-EnS: Environmental Stratification of Kailash Sacred Landscape and Projected Climate Change Impacts on Ecosystems and Productivity** (ICIMOD Working Paper 2013/1), pp 36. International Centre for Integrated Mountain Development, Nepal.
- Metzger MJ, Bunce RGH, Jongman RHG, Sayre R, **Trabucco A**, Zomer RJ (2013) **A high resolution bioclimate map of the world: a unifying framework for global biodiversity research**. *Global Ecology and Biogeography*, 22(5), 630-638.
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- Zomer RJ, **Trabucco A**, Coe R, Place F (2009) **Trees on Farm: Analysis of Global Extent and Socio-ecological Characteristics of Agroforestry**. ICRAF Working Paper n.89
- Maes WH, **Trabucco A**, Achten WMJ, Muys B (2009) **Climatic growing conditions of *Jatropha curcas* L**. *Biomass and Bioenergy*, 10, 1481-1485
- Zomer RJ, **Trabucco A**, Ustin SL (2009) **Building spectral libraries for wetlands land cover classification and hyperspectral remote sensing**. *Journal of Environmental Management*, 7, 2170-2177.
- Trabucco A**, Bossio DA, van Straaten O (2008) **Carbon sequestration, land degradation and water**. In: *Conserving Land, Protecting Water: IMWI Comprehensive Assessment* (Ed. Bossio DA). CABI Publishing. International Water Management Institute.
- Trabucco A**, Zomer RJ, Bossio DA, van Straaten O, Verchot LV (2008) **Climate change mitigation through afforestation/reforestation: A global analysis of hydrologic impacts with four case studies**. *Agriculture, Ecosystems and Environment*, 126, 81-97.
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- Zomer RJ, Bossio DA, **Trabucco A**, Yuanjie L, Gupta DC, Singh VP (2007) **Trees and Water: Smallholder Agroforestry on Irrigated Lands in Northern India** (IWMI Research Report 122), pp 42.
- Ustin SL, **Trabucco A** (2000) **Using Hyperspectral Data to Assess Forest Structure**. *J. Forest*, 98, 47-49.

Il sottoscritto è a conoscenza che, ai sensi dell'art 26 della legge 15/68, le dichiarazioni mendaci, la falsità negli atti e l'uso di atti falsi sono puniti ai sensi del codice penale e delle leggi speciali. Inoltre, il sottoscritto autorizza al trattamento dei dati personali, secondo quanto previsto dal DLgs 196/2003

28/03/2019

Antonio Trabucco