

# Curriculum Vitae

## Personal details:

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Gender: Female  
Date of birth: 11 October 1982  
Place of birth: Haarlem  
Nationality: Dutch

## Education:

### Doctorate:

Defense is planned on 26 October 2012. Title of PhD thesis: 'Biota-hydrology interactions during the Holocene in Florida'. The research is performed at Palaeoecology, Dept. of Physical Geography, UU. Supervisors: Prof. dr. H. Middelkoop (Palaeogeography, UU), Prof. dr. A.F. Lotter (Palaeoecology, UU), Dr. F. Wagner-Cremer (Palaeoecology, UU), Dr. S.C. Dekker (Environmental Sciences, UU).

### Master's degree:

Degree in Quaternary Geology (Physical Geography) is achieved in November 2007, at the Utrecht University. Title of Master's research: 'The reconstruction of lateglacial to early Holocene vegetation development in the Niers-Rhine valley, Germany'. Research supervisors: Dr. W.Z. Hoek (Palaeogeography, UU), and Dr. K. Kasse (Climate Change and Landscape Dynamics, VU Amsterdam).

### Bachelor's degree:

Degree in Physical Geography is achieved in June 2007, at the Utrecht University.

## Employment:

Sept-Dec 2012: Contract extension for the development of a postdoc research proposal to be submitted in January 2013, granted by Geosciences, UU.  
  
Dec 2007-Sept 2008: Junior palynologist at the Dutch geological survey (TNO), Utrecht. I analyzed Quaternary pollen samples for environmental studies, biostratigraphy and archeological studies.

## Non-academic skills and information:

Foreign languages: English (fluent), German, French and Spanish (conversational). (NB: I participated in Spanish language courses in Seville and Granada, (Spain) for a total of 3 months).  
  
Driver's license: Yes, regular driver.  
  
Computer software: MS Word/ Excel/ Powerpoint, Adobe Illustrator/ InDesign/ Photoshop, TILIA, Grapher, C2.

## **Brief summary of my PhD research (300 words):**

My PhD research (start September 2008) was part of a larger multi-disciplinary research project 'Hurricanes and Global Change', in which the research groups Palaeoecology, Geochemistry and Environmental Sciences collaborated to investigate whether the observed recent increase in hurricane activity in Florida is within the natural dynamics of the system, or a consequence of human interference. The focus of my research was to determine the background state of the hydrological regime in Florida. I have studied the response of biota to changes in hydrological conditions in terrestrial as well as shallow marine settings, as a consequence of climate variability, atmospheric CO<sub>2</sub> concentration changes and relative sea level rise during the Holocene. For this, I analyzed pollen and organic-walled dinoflagellates in estuarine deposits, and just pollen in peat deposits, and integrated these results with diatom- and organic geochemical records on the same cores. These multi-proxy studies provide a detailed view of environmental change in the Gulf of Mexico coastal region due to runoff variability and the Holocene transgression, and reflect centennial-scale wet/dry cycles in inland Florida wetlands due to late Holocene precipitation variability. Moreover, historical leaf cuticles analyzed in this research show that plants respond to the anthropogenic CO<sub>2</sub> rise by reducing transpiration rates, through adjustment of leaf stomatal density and size over decades. High-resolution data series and model studies show that this response has already led to a significant reduction in transpiration, and that this adaptation will continue under future CO<sub>2</sub> rise. Through this physiological forcing plants directly affect the energy and hydrological balance, which should be considered for future climate change in addition to changes in radiative forcing. In summary, in this PhD research multiple proxies are applied to various sedimentary archives in Florida to investigate the interactions between climate, sea-level and biota on decadal to multi-millennial timescales.

## **International activities during PhD:**

### Fieldwork/ courses:

- June 2009: US Geological Survey, Reston, VA, USA. Southeast USA pollen identification training by Dr. D. Willard and Drs. C. Bernhardt.
- August 2009: QUESTING summer school, Arc-et-Senans (topic: past wildfire regimes and climate change).
- October-November 2010: Florida fieldwork (collecting fresh leaves from common plant species (Florida peninsula), sampling historical leaf fragments in the University of Florida herbarium (Gainesville), hand-coring and subsurface mapping of peat section and collecting diatom surface samples in central Florida wetland (Sebring)).
- February-March 2011: Florida fieldwork (collecting sediment samples from archived cores (Eckard College, St. Petersburg), collecting fresh leaves from common plant species (Florida peninsula), coring and subsurface mapping of flatwoods basin marsh (Sarasota), collecting marine water/ biota surface samples in estuary (Charlotte Harbor)).

### Conferences/ meetings (also see list of abstracts):

- April 2009: EGU general assembly (Vienna, Austria) (oral presentation).
- May 2010: EGU general assembly (Vienna, Austria) (oral presentation).
- March 2011: GSA south-central section meeting (New Orleans, USA) (oral presentation).
- July 2011: XVIII INQUA congress (Bern, Switzerland) (poster and oral presentation).
- August 2011: DINO9, international conference on modern and fossil dinoflagellates (Liverpool) (poster presentation).

## Scholarships and prizes:

- April 2010: NAC10, Nederlands Aardwetenschappelijk Congres. 2<sup>nd</sup> prize best poster (125 euro).
- December 2010: NSG dag. 1<sup>st</sup> prize best poster (2000 euro).
- February 2012: 4 month post-doc position, granted by the Geosciences board (17500 euro)

## Other academic activities/ teaching

- For the past 4 years, I assisted in and later also redeveloped the pollen morphology and cuticle morphology practicals, which are part of the 3<sup>rd</sup> year Bachelor's course 'Environmental Change through Time' at the UU (~40 students). This included constructing and giving lectures, and preparing and assisting the practicals.
- I have participated in the 'Jonge Academie on Wheels' (organized by the Koninklijke Nederlandse Akademie van Wetenschappen), which aims to introduce high-school students to science in general. Here, I functioned on 4 occasions as team captain of a team of first-year students.
- For the JCU (Junior College of Utrecht) I have prepared and given a lecture about the role of grasses in the silica-cycle, as part of the teaching module 'Aarde in Evolutie'. This project is designed for 6<sup>th</sup> year high-school students, and aims to illustrate how the evolution of horses, whales, grass and diatoms are all connected to geology and climate.
- I have (co)supervised 2 6<sup>th</sup> year high-school students, 1 Bachelor student, and 3 Master students in their research projects.

## Publications (in peer reviewed journals)

Source: Scopus Sciverse

### 2010

Van Soelen, E.E., **E.I. Lammertsma**, H. Cremer, T.H. Donders, F. Sangiorgi, G.R. Brooks, R.A. Larson, J.S. Sinninghe Damsté, F. Wagner-Cremer and G.J. Reichart (2010). Late Holocene sea-level rise in Tampa Bay: Integrated reconstruction using biomarkers, pollen, organic-walled dinoflagellate cysts, and diatoms. *Estuarine, Coastal and Shelf Science*, vol. 86, no. 2, pp. 216-224.

### 2011

**Lammertsma, E.I.**, De Boer, H.J., Dekker, S.C., Dilcher, D.L., Lotter A.F., and Wagner-Cremer (2011). Global CO<sub>2</sub> rise leads to reduced maximum stomatal conductance in Florida vegetation. *Proceedings of the National Academy of Sciences of the United States of America*, vol. 108, no. 10, pp. 4035-4040.

De Boer, H.J., **E.I. Lammertsma**, F. Wagner-Cremer, D.L. Dilcher, M.J. Wassen and S.C. Dekker (2011). Climate forcing due to optimization of maximal leaf conductance in subtropical vegetation under rising CO<sub>2</sub>. *Proceedings of the National Academy of Sciences of the United States of America*, vol. 108, no. 10, pp. 4041-4046.

De Boer, H.J., **E.I. Lammertsma**, F. Wagner-Cremer, D.L. Dilcher, M.J. Wassen and S.C. Dekker (2011). Reply to Miglietta et al.: Maximal transpiration controlled by plants. *Proceedings of the National Academy of Sciences of the United States of America*, vol. 108, no.28, E276.

Pearce, C., H. Cremer, **E.I. Lammertsma** and F. Wagner-Cremer (2011). A 2,500-year record of environmental change in Highlands Hammock State Park (Central Florida, U.S.A.) inferred from siliceous microfossils. *Journal of Paleolimnology*, (online).

### **Thesis chapters to be submitted:**

**E.I. Lammertsma**, F. Sangiorgi, T.H. Donders and F. Wagner-Cremer. Mid to late Holocene hydrological changes at Charlotte Harbor (Florida) inferred from dinoflagellate cysts and pollen. To be submitted to *Journal of Marine Micropaleontology*

**E.I. Lammertsma**, E.E. van Soelen, F. Sangiorgi, G.-J. Reichart and F. Wagner-Cremer. Mid to late Holocene tropical storm occurrences in Florida; regional evidences from estuarine deposits. To be submitted to *Quaternary Research*

**E.I. Lammertsma**, C. Pearce, F. Verhagen, S.C. Dekker, A.F. Lotter and F. Wagner-Cremer. Late Holocene hydrological changes inferred from pollen and diatom assemblages in peat deposits from Highlands Hammock State Park (Florida). To be submitted to *P3*.

### **Abstracts**

#### **2008**

Kuipers, S., **Lammertsma, E.I.**, Hoek, W.Z., Heiri, C. & Kasse, C. (2008). Late Younger Dryas and Early Holocene climate and vegetation changes in the Niers-Rhine valley, Germany: a multi-proxy analysis. In 9th Nederlands Aardwetenschappelijk Congres, Veldhoven. (poster)

#### **2009**

**Lammertsma, E.I.** and Wagner-Cremer, F. (2009). Canopy conductance decrease in Florida as a result of anthropogenic CO<sub>2</sub> increase. Vienna, Austria, EGU General Assembly 2009. (oral)

**Lammertsma, E.I.** and Wagner-Cremer, F. (2009). Hurricane activity and hydrological variability in Florida. NSG Symposium, 2009.: Amsterdam, The Netherlands. (poster)

**Lammertsma, E.I.** , Wagner-Cremer, F. and Lotter, A.F. (2009). Hurricanes and global change: hurricane activity and hydrological variability in Florida. QUESTING Summer School: Arc-et-Senans, France. (poster)

Van Soelen, E.E., Brooks, G., **Lammertsma, E.I.**, Donders, T.H., Wagner-Cremer, F., Sangiorgi, F., Cremer, H., Sinninghe Damsté, J.S. & Reichart, G.-J. (2009). Evaluation of organic geochemical and micropaleontological proxies for Holocene paleoclimate reconstructions in Tampa Bay, Florida. In *Geophysical Research Abstracts*, Vol. 11 (pp. EGU2009-2718). Vienna, Austria: EGU. (poster)

#### **2010**

**Lammertsma, E.I.**, Wagner-Cremer, F. and Kürschner, W.M. (2010). Assessing stomatal conductance changes on short and long time scales and its possible impact on climate. In *Geophysical Research Abstracts*, Vol.12. Vienna. (oral, invited speaker)

**Lammertsma, E.I.** and Wagner-Cremer, F. (2009). Hurricane activity and hydrological variability in Florida. NAC 10 Veldhoven, The Netherlands. (poster, 2<sup>nd</sup> prize).

Boer, H.J. de, **Lammertsma, E.I.** and Dekker, S.C. (2010). Climatic effects of structural stomatal adaptation to rising CO<sub>2</sub>. Istituto Veneto di Scienze Lettere ed Arti, Venice, Italy, Invited presentation at the Summer school on Biogeodynamics and Earth System Sciences (BESS). (oral)

**Lammertsma, E.I.**, H.J. de Boer, S.C. Dekker, D.L. Dilcher, A.F. Lotter and F. Wagner-Cremer (2010). Global CO<sub>2</sub> rise leads to reduced maximum stomatal conductance in Florida vegetation. 17th NSG Annual Symposium: Utrecht (2010). (poster, 1<sup>st</sup> prize)

## **2011**

**Lammertsma, E.I.**, Sangiorgi, F., van Soelen, E.E., Reichert, G.-J. & Wagner-Cremer, F. (2011). Holocene hydrological changes inferred from dinoflagellate cyst and pollen assemblages in estuarine deposits from Charlotte Harbor, Florida. New Orleans, USA, GSA Meeting. (oral)

**Lammertsma, E.I.**, Kuiper, S., Kasse, C., Heiri, O. & Hoek, W.Z. (2011). Preboreal climate instability: a multi-proxy analysis of the 'Rammelsbeek Phase' in the Niers-Rhine valley, Germany. Bern, XVIII INQUA Congress, Bern. (oral and poster)

**Lammertsma, E.I.**, Pearce, C., Cremer, H., Gaiser, E. and Wagner-Cremer, F. (2011). Pollen and diatom inferred Late Holocene hydrological changes in central Florida. XVIII INQUA Congress, Bern. (poster)

**Lammertsma, E.I.**, Sangiorgi, F., Soelen, E.E. van, Reichert, G.-J. & Wagner-Cremer, F. (2011). Holocene hydrological changes inferred from dinoflagellate cyst and pollen assemblages in two Florida estuaries. DINO9: Liverpool, UK. (poster)

Boer, H.J. de, **Lammertsma, E.I.**, Wagner-Cremer, F., Dilcher, D.L., Wassen, M.J. & Dekker, S.C. (2011). Stomatal adaptation to atmospheric CO<sub>2</sub>. Lunteren, The Netherlands, Joint conference of Darwin Centre for Geobiology and The Netherlands Ecological Research Network (NERN). (oral)