

Career Development Plan - Year 1 (Draft)

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Department: ER3 – Dendroprovenancing
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BRIEF OVERVIEW OF RESEARCH PROJECT AND MAJOR ACCOMPLISHMENTS EXPECTED:

The ER3 position is embedded in the ForSEAdiscovery project, that aims to extend the current understanding of forest resource availability and of timber trade in the Iberian empires during the Age of discovery. For this purpose, historical research, maritime archaeology, and dendroprovenancing will be integrated. Additionally, the ForSEAdiscovery project foresees training of the fellows to do research in a multidisciplinary context, as well as training in scientific communication and project management.

The ER3 position will focus on integrating different techniques for dating and provenancing of timbers, including: tree-ring measurements, determination of wood anatomical markers, and the analyses of biomarkers and geo/dendrochemical signals. Ultimately, a protocol will be developed to date and provenance (archaeological) timbers. This protocol will be applied to all ship timbers collected by the fellows of WP2 and will allow to date the archaeological timbers and to pinpoint source areas of timber for the 16th and 17th-century Iberian shipbuilding industries. These results will provide an empirical tool to cross-validate archaeological findings and information from historical records.

The position will also include the co-supervision of ESRs in WP3, training them in the selection and sampling of living trees and building structures for dendrochronological research, as well as in tree-ring research methods and statistical techniques. Dissemination of results is also an indispensable part of this position and the fellow will publish results in peer-reviewed journals and progress reports and present results at international conferences and meetings. Additionally, the fellow will whenever possible participate in educational activities at universities or schools, and will use digital media

(e.g., blogs, informative videos, etc.) to disseminate the work and results to the general public.

LONG-TERM CAREER OBJECTIVES (over 5 years):

1. Goals:

My long-term objectives are to become more equipped to set up and coordinate multi-disciplinary research projects focused on the implementation of tree-ring analysis in a context of climatological, historical, ecological and forest management research. Ultimately, I would like to contribute to the understanding of tree growth and its importance for human kind, both in the present and in the past.

Within the ForSEAdiscovery I intend to:

- set up an integrative protocol that can be applied to identify, date, and provenance wood samples. This approach will have an application in archaeological studies as well as in other fields, such as identifying and provenancing illegally logged timbers.
 - improve my knowledge on dendrochronology, on quantitative wood anatomy, and on isotope analysis.
 - become better equipped in organising and leading large-scale and multi-disciplinary research projects.
 - learn the techniques for chemical analysis of wood samples to identify (bio)markers and geochemical tracers for the provenancing and species identification of wood samples. This will include pyrolysis coupled to gas chromatography and mass spectrometry (Py-GC/MS) and Fourier-transform infrared (FTIR) spectroscopy, the measurement of Strontium isotopes (Sr), and of major and trace elements in the wood.
 - learn to work with Geographic Information Systems (GIS) to integrate and visualise the different provenancing methods
 - extend my knowledge beyond the areas foreseen in my Work Package and learn about historical and archaeological research and techniques
2. What further research activity or other training is needed to attain these goals?
- Training in GIS techniques to integrate the provenance areas obtained with the different analysis techniques

- Secondments to acquire new expertise in the biogeochemical analysis (Strontium isotopes) techniques at the Université de Lorraine (UdL)
- Field campaign in Portugal (forests and buildings) to establish long-term chronologies in relevant timber producing areas in the XVI to XVIII centuries, combined with a secondment at the University of Wales Trinity Saint David (UWTSD) for measurement and analysis of data
- Enhance my leadership and communication skills by following courses and by (helping in) organising fieldwork campaigns and workshops
- Participation in workshops and intensive courses in, among others, historiography, archaeology and early-modern shipbuilding techniques, GIS, etc. within the ForSEAdiscovery project

SHORT-TERM OBJECTIVES (1-2 years):

1. Research results

- Anticipated publications
 - o Writing and participating in publications about dating and provenancing the individual shipwrecks in the ForSEAdiscovery project: Finisterre, Magdalena (Viveiro), Ribadeo, Belinho, Yarmouth Roads, etc.
 - o Paper on the comparison of different methods (dendrochronology, wood anatomy, bio(geo)chemical analyses) to distinguish wood coming from different oak species (*Quercus robur*, *Q. pyrenaica*, *Q. petraea*, *Q. faginea*, *Q. pubescens*) and from two pine species (*Pinus sylvestris*, *P. nigra*) that cannot be distinguished anatomically from one another
 - o Methodological paper including a protocol to integrate different dendroprovenancing techniques for ship timbers
 - o Publications related to the construction and analyses of reference chronologies on ring widths, vessel features, and wood density throughout the Iberian Peninsula
 - o Continued publication of results from prior research project complementary to the project: more specifically one chapter of the PhD thesis and an ongoing manuscript
- Anticipated conference, workshop attendance, courses, and /or similar presentations:
 - o Participation in all academic events, annual Network Meetings, workshops, and intensive courses organised within ForSEAdiscovery. For instance, participation in the workshop "Application of Geographic Information System (GIS) to Maritime History and Archaeology", organising and

participating in the workshop Dendrochronology & Wood Anatomy, from 9-11 December 2015 in Wageningen.

- Presenting at international conferences related to tree-ring studies and to archaeology, such as: International Congress on Underwater Archaeology (IKUWA6) from 28 November till 2 December 2016, in Fremantle Australia; TRACE - Tree Rings in Archaeology, Climatology and Ecology in 2016; EuroDendro conference; etc.
- Where possible, participation as speaker at university courses and symposia, pending on invitations

2. Research results Research skills and techniques:

- Training in specific new areas, or technical expertise etc.:
 - programming and working with GIS environments (QGIS or ArcGIS)
 - training in database management
 - become more familiar with shipbuilding and nautical archaeology techniques and terminology
 - learn about historical research, techniques and terminology
 - improve knowledge of isotope and bio(geo)chemical analyses of wood samples

3. Research management:

- Fellowship or other funding applications planned (indicate name of award if known; include fellowships with entire funding periods, grants written/applied for/received, professional society presentation awards or travel awards, etc.):
 - I plan to apply for national (Spanish) or European travelling grants to finance congress visits. Additionally, I plan to apply for a follow-up postdoctoral grant (e.g., the "Plan Nacional de Investigación Científica y Técnica y de Innovación (I+D+i)" of the Spanish "Ministerio de Economía y Competitividad", Dutch NWO Veni grant, or a Marie Skłodowska-Curie Individual Fellowship grant) in the second half of my employment.

4. Communication skills:

- I intend to continue improving my Spanish language skills
- By presenting at Network Meetings and at international conferences I will improve my presentation skills

- I hope to improve my public dissemination skills, by participating in and producing (i.e., filming and editing) short documentaries and news-items in collaboration with Dixit International
5. Other professional training (course work, teaching activity):
- Help organising ForSEAdiscovery workshops to improve my skills herein
 - Course or secondment at Dixit International to acquire skills on the production of movies for the dissemination of scientific information.
 - I will look for teaching opportunities within and outside the University of Santiago de Compostela.
6. Anticipated networking opportunities:
- I expect to profit strongly from the networking opportunities within the ForSEAdiscovery project, not only within my work package / discipline but also with the other disciplines involved.
 - At international conferences I also anticipate many networking opportunities, which are enhanced by the exposure inherent to working on a large research project such as the ForSEAdiscovery
7. Other activities (community, etc.) with professional relevance:
- I intend to participate in the dissemination and outreach activities as set by Working Package 6, including the presentation of results at local shipbuilding meetings (e.g., the “Encontro de Embarcacións Tradicionais” organised yearly in Galicia), or at the building site of the San Juan in Albaola (<http://www.albaola.com/en>).

Date & Signature of fellow:

Date & Signature of supervisor

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October 29th, 2015

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