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Project Acronym: ForSeaDiscovery

Project Full Name: Forest resources for Iberian Empires: Ecology
and Globalization in the Age of Discovery

Marie Curie Actions

Final Report

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Final Report

PROJECT FINAL REPORT

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1. FINAL PUBLISHABLE SUMMARY REPORT

Comments:

In the Early Modern Age (16th-18th centuries) the construction of ocean-going ships was paramount to the development of cultural encounters in what became known as the Age of Discovery. In the case of the Iberian Empires, the establishment of new trade routes brought the need for armed merchantmen, galleons and smaller vessels, placing unprecedented demands on Iberian forests for the supply of construction timber. Forestry and sea power became inextricably linked, creating new geopolitical tensions, alliances and forest regulations. The main objective of this project is to increase the research background and experience of the research fellows through a combination of dedicated training in both transferable and research specific skills, and their participation in a truly multidisciplinary research project which combines historical, archaeological and dendrochronological methodologies in the study of the exploitation of Iberian and other European forest resources for shipbuilding during the Age of Discovery. During the project, research actions have focused on addressing specific scientific and technological objectives according to the three closely interdisciplinary work packages: Archival research has been conducted in Spanish, Dutch and Portuguese archives in order to set and analysis patterns of demand for timber (particularly oak and pine) for Iberian shipbuilding are also being identified through examination and analysis of shipbuilding contracts ('asientos'), merchant networks, treatises and standards (e.g. 'ordenanzas'). A multi-lingual thesaurus of Iberian shipbuilding terms, focused on ship timbers, has been developed and continues to be expanded as the terminology of different authorities are added. A relational database and Geographic Information System (GIS) has been designed to manage the diverse datasets being collected and synthesized including the journeys of ships and fleets which sailed from Spain and Portugal to the Americas and Asia; ship wrecks which have been identified as archaeological sites or in archival sources; architectural features of such shipwrecks; samples of timber coming from different sources (shipwrecks, historical buildings, and wood from living trees); and results of different types of analysis (dendro-analysis, isotope analysis, DNA analysis, etc.).

An archaeological diving team has been developed through a combination of assessment of fellows' diving qualification and competence, a period of intensive diver training leading to qualification (UK HSE SCUBA) as scientific divers, and a sustained campaign of archaeological diving and sampling of historic shipwrecks. Nautical diving campaigns have been undertaken in Spain, Portugal and United Kingdom on Iberian historic shipwrecks. Samples taken from these sites were passed to wood science fellows for dendrochronological analysis, and to provide those researchers developing new analytical approaches with control samples from shipwrecks with known origins (Bayonnaise, Magdalena). A team, working in collaboration with local archaeologists, undertook a detailed study of an early collection of ship's timbers in Esposende, Northern Portugal. This sub-project provided an opportunity to develop innovative 3D digital approaches to recording and analysis, allowed targeted sampling for wood science, and, through running of an open summer school, access to this innovative work for other researchers and interested local volunteers. In the United Kingdom, timber samples were recovered from the Yarmouth Roads protected wreck, a suspected late-16th century Spanish merchant vessel. There has been very positive engagement with external archaeological projects with ForSEADiscovery divers recovering timber samples from the Delta III wreck (Cadiz), the suspected 16th century Highbourne Cay shipwreck (Bahamas), and the Emanuel Point wrecks (Florida, USA). Throughout these research actions, public and journalistic engagement has been excellent leading to numerous opportunities for outreach of project objectives and actions, and the wider aspirations of the Marie Curie program to a wide, non-academic audience.

The third main group of researchers, developing approaches to wood provenance, have been equally industrious carrying out sampling of living trees and historic buildings in targeted locations in the Iberian Peninsula where, historically, timbers were sourced for shipbuilding. Such sampling cam

paigms included black pine from central Spain and Andalusia; Scots pine from central Spain, and oaks from the Basque country, Eastern Cantabria, and Asturias. Core samples from these living trees were used to develop chronologies of ring-width and anatomical features with which to date material from Iberian shipwrecks. The chronologies produced were extended back in time through analysis of samples from historic buildings, reaching the beginning of the 14th century for the oaks in the North, and the 11th century for the pines. Studies on wood organic compounds using FT-IR and pyrolysis, Sr-isotopic and elementary composition of the wood and nearby soil and rocks, and DNA-analyses helped develop a set of techniques for improving wood provenancing. This historical material, together with that obtained in Southern Spain, and several samples from the first shipwrecks were the basis for the first methodological tests of the groups involved in organic and inorganic markers. The project so far has been characterised by the multi-disciplinary approach with researchers training in each other's core disciplines, as well as their own, and participating in each other's research actions. Collaboration and interaction within teams has been encouraged to foster the skills needed for successful research career development. The project is developing a relational database to hold diverse data on historical shipbuilding in the Iberian Peninsula which will become a major research and heritage management tool in the future. In parallel, guidance on protocols and best practice (in areas such as archaeological diving and sampling practices) and the development of wood provenancing methods will foster scientific approaches in the understanding and protection of underwater cultural heritage wherever Iberian shipwrecks survive. These developments will have impacts within government policy, heritage practice (within both academic and commercial research environments), and more widely in terms of non-academic appreciation of the role of science in understanding our common maritime heritage.

Contact:

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Training Coordinator: Prof. Nigel Nayling, Faculty of Humanities and Performing Arts, University of Wales Trinity Saint David, Lampeter, Ceredigion SA48 7ED, Wales, United Kingdom.

Scientific Coordinator: Prof. Dr. Ignacio García-González, Universidad de Santiago de Compostela, Campus Terra, Departamento de Botánica, EPSE, 27002 Lugo, Spain.

<http://forseadiscovery.eu/>

2. USE AND DISSEMINATION OF FOREGROUND

Section A (public) – DISSEMINATION MEASURES

Dissemination activities

Comments:

An intensive program of academic interaction and dissemination has taken place during the ForSEAdiscovery project:

1. OUTREACH

ForSEAdiscovery acknowledges the importance of training ESRs and ERs in communication skills in order to disseminate research and results of publicly funded research to society. The consortium is ensuring that the results will be made known to non-specialist audiences by the participation of ESRs, ERs and PIs in audiovisual reports (news-items, short documentaries) organised by Associated Partner 14, Malcolm Dixelius (Dixit International) as the individual research projects progress. Additionally, the ESRs and ERs will be engaged in other outreach activities that promote the public engagement of researchers with the broader public:

1. Dissemination of results to specialized audiences is being achieved through the attendance at established international conferences for specific research topics (e.g. International Association of Economic History, World History Association, IKUWA, ISBSA, EuroDendro, WorldDendro, etc). This gives the ESRs and ERs the chance to present their research, the ForSEAdiscovery project and themselves, enhancing the chances to expand and consolidate their network (see list of presentations and activities).

2. The development of a ForSEAdiscovery website (designed by Partner 1 and ER1) serves as the first platform to introduce the partners and their members to wider society. It also contains contact information, results and activities developed by the consortium. ESRs and ERs are responsible for updating the information related to each individual research project and the supervisor monitors the content on a regular basis.

3. Science fairs and oral presentations at universities and secondary schools. ESR and ER have participated in some presentation in local schools and at universities, targeting students in later stages of their education. This activity will help students in their decision-making process to choose a professional career.

4. Dissemination of results in the media: Throughout the research project activities, public and scientific events have been the subject of repeated appearances in the local and international press, on radio and on television.

See: <http://forseadiscovery.eu/news>

<http://forseadiscovery.cchs.csic.es/content/shipwrecks-around-finisterre-coru%C3%B1a>

<http://www.abc.es/cultura/20150216/abci-forseadiscovery-globalizacion-estudia-desde-201502161006.html>

5. Social networks (facebook: <https://www.facebook.com/forseadiscovery>)

Outreach and dissemination formed an integral part of the nautical archaeology research actions undertaken by the network in 2015. During diving operations in Finisterre, Viveiro and Ribadeo, Galicia (June 2015), repeated engagement with local and national journalists led to articles appearing in local and national newspapers (and their associated web pages), and radio and television programs with a focus on science as well as regional news items.

See: <http://forseadiscovery.cchs.csic.es/news>

Collaboration with local dive clubs allowed sports divers to observe our work. Divers from the Spanish Armada also dived on our excavations, observing both the diving protocols and scientific procedures employed. Work at the Spanish galleon in Ribadeo was carried out with the support of the local association which is fostering research and protection of this internationally important shipwreck. The association hosted a very well attended evening conference where the ForSEADiscovery network coordinator and associate partner spoke, explaining the scientific objectives of the network's work. An international fieldschool ("Esposende acolhe Escola Internacional de Arqueologia Náutica e Subaquática") was run during August 2015 at Esposende, Northern Portugal demonstrating innovative methods of ship timber recording and sampling. This collaboration with local archaeologists led to subsequent involvement in colloquia celebrating 30 years of archaeology in Esposende in November 2015.

Fellows have also developed two very interesting blogs:

<https://forseadiscovery.wordpress.com/category/nautical-archaeology/>

<http://iberianautical.blogspot.com.es/>

Videos on YouTube:

<https://forseadiscovery.wordpress.com/wp2/nautical-archaeology-video-playlist/>

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The ER2 fellow, Sara Richs is preparing: "In-situ Timber Sampling Protocols (With a focus on 'Iberian' shipwrecks)". Draft prepared, to be published in print and online.

Contribution from outside the network: members of ForSEADiscovery Consortium also have their own networks, which include contacts with the public sector and with private companies. Some members of the network have visited and organized a meeting in the Centro de Arqueología Subacuática de la Junta de Andalucía (CAS-IAPS) (Cádiz, 5-7 February 2015). The dendrochronological team also works in collaboration with the Department of Agroforestry Sciences at the University of Huelva, who participated in the sampling campaigns in Southern Spain.

2. DISSEMINATION:

Attendance and participation to International Conferences, Seminars and Workshop:

1. EURODENDRO 2014, Lugo (Spain), 8-12 September, 2014. This is the first time this international conference on dendrochronology has been held in the Iberian Peninsula, and provided an opportunity to inform delegates of the ForSEADiscovery project's objectives. Numerous partners and

ESRs participated.

2. IKUWA V: Un patrimonio para la Humanidad, Cartagena (Spain), 15–18 October 2014. This is the first time this international underwater archaeology conference has been held in the Iberian Peninsula and provided an opportunity to inform delegates of the ForSEADiscovery project's objectives. Numerous partners and ESRs participated. Publication through peer-reviewed conference proceedings is planned and a paper outlining the ForSEADiscovery project's objectives and methodological approach submitted. This international congress, closely associated with the UNESCO Convention on Protection of the Underwater Cultural Heritage, which is due to be held in Fremantle Australia in November/December 2016 (IKUWA VI) will include a session proposed by the ForSEADiscovery project (“Floating Forests/ Submerged Forests: An Environmental History of Trees”) which will provide an excellent opportunity to disseminate the scientific results of our researchers.

3. A gestão dos recursos florestais Ibéricos na construção naval da Moderna: História e Arqueologia, Lisbon (Portugal), 26–27 November 2014. Presentations were made by Work Package 2 and Work Package 1 Research Coordinator and ESRs and publication of the proceedings is planned.

4. Workshop Change point modelling, Department of Geological Sciences and the Bolin Centre for Climate Research, University of Stockholm (Sweden), 10–12 November 2014.

5. Participation N.W. Posthumus–Graduate Training Session 1, Brussels (Belgium), December 2014.

6. Participation in a meeting at the American Historical Association, New York (USA), January 2015.

7. Participation in local outreach activities by individual Fellows and in documentaries and news items, in Barcelona (February 2014); Madrid (March 2014); Lisbon (May 2014); Lugo (8 September 2014) and Finisterre, Galicia (September 2014).

8. Outreach activity in Lugo: A stand was set up in the Plaza Mayor in Lugo to inform the citizens about dendrochronology and different application of this Science. Some samples were displayed from timber elements of the Ribadeo shipwrecks, collected by Miguel San Claudio, Archaeonauta SL. (7 September 2014, Lugo, Spain).

9. Outreach activity in Wageningen: Wood in the SPOTlight, an evening with six ten minutes lectures presenting different application of dendrochronology in different parts of the world and a wood market where the invited speakers showed posters and samples related to their research (17 February 2015).

10. Presentation: “Artefact or Ecofact? Assessing the Timbers from the Submerged Mesolithic Landscape at Bouldnor Cliff, UK”, 1st European Conference on Scientific Diving, Stuttgart (1-3 March 2015) Paper by Sara Rich.

11. Conference on Underwater Archaeology Land under water. Nuremberg. 22/03/2015 (Papers presented by Ana Crespo Solana, Koldo Trapaga Monchet, Antonio Rochas, Garry Momber & Sara Rich)

12. Lecture “Supplying the Enemy: Dutch Commercial Networks providing Timber to the Spanish Seaborne Empire, 1581-1621” by Germán Jiménez Montes. Early Modern Seminar at RUG (20th April)

13. Presentation by Sara Rich: Invited guest lecturer at the Vrije Universiteit Brussel, “Wood Provenance Methods and Applications in Archaeology” (29 April 2015).

14. “Las armadas en el reino de Portugal en los reinados de los Felipes (1580-1640)”, Paper presented by Koldo Trápaga Monchet in III Encuentro de Jóvenes Investigadores. Líneas recientes de investigación en Historia Moderna: Familia, cultura material y formas de poder. Held in Valladolid 2-3 July 2015.

15. Congreso LASA (Latin American Studies Association). San Juan de Puerto Rico, 27/05/2015-30/05/2015. Panel session and papers presented by Ana Crespo, Nigel Nayling, Miguel San Claudio, Adolfo Martín and Filipe Castro

16. International Conference Connected Oceans 2015 – New Avenues of Research in Maritime and Oceans History, University of Porto (Portugal), 08/06/2015-12/06/2015. Papers presented by José

Luis Gasch-Tomás, Koldo Trápaga & Ana Rita Trindade.

17. Congreso Internacional sobre Nuevas Tendencias en Humanidades 2015. Vancouver (Canadá), 17/06/2015-19/06/2015. Dissemination of the ForSEADiscovery project by Ana Crespo Solana
18. 6th Sound Toll Registers Online Conference in Antwerp, Belgium (22-23 October, 2015), Paper presented by Manish Kumar.
19. Presentation by Sara Rich: “Nautical Archaeology and the Hermeneutics of the Anti-Social”, European Association of Archaeologists, Glasgow (2-5 September)
20. Conference: Session Chair by Sara Rich: Maritime Mobility, European Association of Archaeologists, Glasgow (2-5 September)
21. International Symposium on Boat and Ship Archaeology. Baltic and Beyond (ISBSA14), organized by National Maritime Museum in Gdansk (Poland), 21/09/2015-25/09/2015. Several posters presented by members of ForSEADiscovery Project: Nigel Nayling, Ana Crespo Solana, José Luis Gasch-Tomás, Ana Rita Trindade, Adolfo Martins, Antonio Rochas, María José García Rodríguez.
22. Tercer Coloquio Internacional sobre Cultura Marítima en México. Espacios Marítimos y proyecciones Culturales, organized by “Instituto Nacional de Antropología e Historia (INAH)”, Campeche (Mexico), 21/10/2015-23/10/2015. Papers presented by Miguel San Claudio & José Luis Gasch-Tomás.
23. Conference: EuroDendro 2015, Antalya (18-23 October 2015)
24. Congreso Internacional de Historia Económica del Caribe organized by University of West Indies. The history of investment in the Caribbean. 4/11/2015-7/11/2015. Trinidad y Tobago. Dissemination by Ana Crespo Solana.
25. Colóquio Internacional Património, Turismo e Desenvolvimento ESPOSENDE - 30 anos de Arqueologia 1985-2015 16-17/11/2015, Esposende, Portugal. Paper on recording and analysis of ship timber assemblage from Belinho presented by Adolfo Martin and Nigel Nayling.

26. IKUWA 6. The Sixth International Congress on Underwater Archaeology. Western Australia Museum. 28 November- 2 December, 2016. Session organized by Nigel Nayling and Ana Crespo Solana, Floating forests / submerged forests: an environmental history of trees
Papers:
 - a. Filipe Castro, “Ship sizes and wood scantlings”
 - b. Adolfo Miguel Martins, Ana Almeida, Antonio Santos, Ivone Magalhaes, Filipe Castro, Jemma Bezzant, Marta Dominguez, Delmas, Nigel Nayling and Peter Gronendijk, “Reconstructing Trees from Ship Timber Assemblages Using 3D Modelling Technologies: Evidence from Belinho in northern Portugal”
 - c. Beñat Eguiluz Miranda, José L. Gasch-Tomás, Marta Domínguez Delmás, Miguel San Claudio, and Koldo Trápaga Monchet, “The Ribadeo Shipwreck (c. 1600) a multidisciplinary approach for an Iberian shipbuilding case study”.
 - d. Ana Rita Trindade, Sara Rich, Adolfo Martins, Mohamed Traoré & Nathan Gallagher, “From forests to the sea, from the sea to the laboratory: the Santa Maria Magdalena frigate”.
 - e. Sara Rich, Garry Momber and Nigel Nayling, “Maritime archaeological timber sampling: methods and results from the silty Solent”
 - f. Aoife Daly, Marta Dominguez Delmás, Wendy van Duivenvoorde & Jeremy Green, “Timber for the Batavia”
27. 51st Annual Conference on Historical and Underwater Archaeology, International Society for Historical Archaeology Conference, Landscapes, Entrepôts and Global Currents: New Orleans (USA), January 3-6. 2018.
 - a. Nigel Nayling: “Highbourne Cay Shipwreck. Excavations Dendroarchaeology”. Converging Worlds: Highbourne Cay Wreck Symposium.
 - b. Selina Ali, Julian Hainsworth, John Carroll, Richard Morgan, “The Past in Pixels: Exploring Herit

- age in Virtual Environments” Session Outreach and Engagement in Underwater Archaeology.
28. Conferencia Internacional: Humanidades Digitales Hispánicas. Sociedad Internacional, III Congreso Internacional: Sociedad, políticas, saberes, Málaga (Spain), 18-20 October 2017
- a. Koldo Trápaga Monchet & María José García Rodríguez: “Los aprovechamientos forestales de los bosques portugueses desde una perspectiva cartográfica durante la Unión Ibérica (c. 1580-1640)”,
- b. Ana Crespo Solana, María José García Rodríguez, Ignacio García González, Nigel Nayling, José Luis Gasch Tomas, Peter Groenendijk, Sara Rich, Marta Domínguez Delmás, “Gis Application for an interdisciplinary Project in History, Maritime Archaeology and Wood Provenance (ForSEAdiscovery). Dissemination of the GIS Data model of the ForSEAdiscovery project”
29. International Conference: Ameridendro, Mendoza(Argentina) 28th March-1st April, 2016.
30. Domínguez-Delmás, Marta, Groenendijk, Peter, Akhmetzyanov, Linar, Alejano-Monge, Reyes, García-González, Ignacio. Unravelling timber supply for shipbuilding in Atlantic Iberia in the Early Modern Period by dendrochronology.
31. TRACE 2017. Tree rings in Archaeology, Climatology and Ecology. Svetlogorsk, Kaliningrad (Russia) 16th- 21st May, 2017. Akhmetzyanov, Linar, García-González, Ignacio, Groenendijk, Peter & Sass-Klaassen, Ute. What do vessels hide? Potential of oak earlywood vessels for dendroprovenancing
32. International Conference: EuroDendro 2017, University of Tartu (Estonia) 6th-10th September, 2017.
- a. Domínguez-Delmás, Marta, Groenendijk, Peter, Wazny, Tomasz, Alejano-Monge, Reyes, García-González, Ignacio. Is dendrochronology enough to establish the date and provenance of Iberian ship wreck timbers?
- b. Wazny, Tomasz, García-González, Ignacio, Akhmetzyanov, Linar, Nayling, Nigel, Domínguez-Delmás, Marta, Groenendijk, Peter, Crespo Solana, Ana. The ForSEAdiscovery Project - How wood powered the Iberian World Exploration.
33. Dissemination of individual project by the ForSEAdiscovery fellows:
- a. Koldo Trápaga Monchet: “How did contribute the royal forests of Portugal to sustaining the Spanish Monarchy (c. 1600-1640)?”, in “Kings and Queens 6: in the Shadow of the Throne”, Madrid, September 12-15th 2017
- b. K. Trápaga Monchet: “Más madera”: agentes y vías de provisión de madera para las flotas reales en Portugal (1598-1611)”, for “IV Encuentro de Jóvenes en Historia Moderna: ‘Nuevas perspectivas de investigación en historia moderna: economía, sociedad, política y cultura en el mundo hispánico’”, Barcelona, 5-6 July 2017.
- c. K. Trápaga Monchet: “How could the maritime struggle affect the environment of Portugal within a ‘Composite Monarchy’ (1601-1617)”, in the International Conference “European Society for Environmental History: “Environment in areas of contact among states, economic systems, cultures and religions”. Zagreb, Junio 28 – 2 de Julio.
- d. K. Trápaga Monchet, F. Labrador Arroyo: “Beat the odds: coping with Portuguese and Spanish archival sources to study the Portuguese forested areas during the Iberian Union (1580-1640)”, II conference of the Portuguese Network of Environmental History: “Environmental Changes in historical perspective”, Lisbon, 4-6 mayo 2017.
- e. Koldo Trápaga Monchet: “Who did protect Portuguese forests? Safeguarding and conserving forests belonging to the Crown in Portugal (1605-1640)”, held at FCSH in Lisbon (27th January)”
- f. Koldo Trápaga Monchet: “La ciudad de Lisboa como puerta hacia el mar: los sucesos de la nau Saõ Roque y la carrera de India (1602-1603)”, held in Lisbon, January 23rd 2017 at 18:00 hours, as an activity of the “Comissão de Estudos Olisiponenses.
- g. Koldo Trápaga Monchet: “El sustento del Imperio: los recursos forestales de Portugal para las armadas reales (1560-1640)”, within the Seminary “Novas Perspectivas em História Moderna” organized by José Vicente Serrão, December 6th 2016, University of Tartu (Estonia) 6th-10th September,

2017Lisbon.

h. Beñat Eguiluz Miranda, Marta Domínguez- Delmás, Marta, Groenendijk, Peter, Wazny, Tomasz, Alejano-Monge, Reyes, García-González, Ignacio. Is dendrochronology enough to establish the date and provenance of Iberian shipwreck timbers?

i. Wazny, Tomasz, García-González, Ignacio, Akhmetzyanov, Linar, Nayling, Nigel, Domínguez-Delmás, Marta, Groenendijk, Peter, Ana Crespo Solana, Ana. José Luis Gasch-Tomás, Miguel San Claudio & Koldo Trápaga Monchet: “The ForSEADiscovery Project - How wood powered the Iberian World Exploration

j. Ribadeo Shipwreck (c. 1600): A multidisciplinary approach for an Iberian shipbuilding case study”, in International Conference: Ameridendro, Mendoza(Argentina) 28th March-1st April, IKUWA6, held at Western Australian Museum in Fremantle (Australia) November 29th 2016.

k. Domínguez-Delmás, Marta, Groenendijk, Peter, Akhmetzyanov, Linar, Alejano-Monge, Reyes, García-González, Ignacio. Unravelling timber supply for shipbuilding in Atlantic Iberia in the Early Modern Period by dendrochronology

l. Koldo Trápaga Monchet, Javier Revilla Canora: “Forgiving and reincorporating ‘faithful’ vassals within the Spanish Monarchy: Naples, Catalonia, Portugal and Sardinia (1647-1679)”, in XIIes Journées d’Histoire des Monarchies Ibériques. Réconcilier et réincorporer. Discours, cérémonies, pratiques”, November 24-26. Valenciennes (France) – Kortrijk (Belgium).

m. Ignacio González Espinosa-“Timber for the royal shipyards in Portugal: Between self-sufficiency and northern supply” in International Congress, The 17 provinces of the Low Countries and the Iberian Peninsula: New perspectives and methodologies. Organisers: ForSEADiscovery, Faculty of Arts, N.W. Posthumus Institute. Date: 28-29 September, 2017. Groningen, The Netherlands.

n. José Luis Gasch Tomas, Public lecture “Shipbuilding and Globalization. Tar trade from the Baltic to the Iberian Peninsula in the 18th century”, organized by the Department of History at the University of Groningen (The Netherlands), 21/03/2016.

o. Peter Groenendijk, Presentation: Zuidema, P. et al. 2016, Reconstructing growth trends from tree-ring data: can we account for biases? Association of tropical Biology and Conservation ATBC 2016, Montpellier – France

p. Ana Rita Trindade, April 2016 : XX congreso del AMEC, El caribe en el mundo dinámicas y reconfiguraciones. Veracruz, Mexico. Presentation of paper: “Maderas de Occidente: El empleo de maderas del Caribe en la construcción naval en Cadiz (1717-1759)”, with Project Coordinator Ana Crespo Solana

q. Ana Rita Trindade, September 2017: The 17 provinces of the Low Countries and the Iberian Peninsula: New perspectives and methodologies. Faculty of Arts (University of Groningen), N.W. Posthumus Institute. Presentation of the paper: “Dutch merchants and shipmasters in the trade of timber to Cadiz in the early Bourbon period”.

r. Germán Jiménez Montes, 14-15 April 2016, Utrecht (The Netherlands), N.W. Posthumus Institute and University of Utrecht: Presentation at Posthumus first seminar: Work in progress “Supplying the enemy? North-European suppliers of timber in Seville from 1580 to 1598”

s. Germán Jiménez Montes, June 2016 Lampeter (Wales), University of Wales - Trinity Saint David: Presentation at Postgraduate Research Group Seminar “Transnational Networks involved in Timber Trade during the reign of Philip II”

t. Germán Jiménez Montes, 30 September 2016, Groningen (The Netherlands), University of Groningen: Presentation at Groningen Joint Economic History seminar “Supplying the enemy? North-European suppliers of timber in Seville from 1580 to 1598”

u. Germán Jiménez Montes, 19-21 October 2016, Pisa (Italy), ESTER, Scuola Normale Superiore Pisa and Scuola Universitaria Superiore Pisa: Presentation at ESTER Research Design Course “Supplying the enemy? North-European suppliers of timber in Seville from 1580 to 1598”

w. Germán Jiménez Montes, 19-20 October 2017, Marennes-Oléron (France), University of West Brittany, University of Poitiers, and TRESOAR: Presentation at the 7th conference Sound Toll Re

gisters Online “Notarial documents as a complementary perspective to the Sound Toll Registers : Baltic trade in Andalusia from 1570 to 1600”

b. Workshops and Seminars (2016- 2018):

1. Heritage & Environment Research Cluster Seminar Series. Building Boats and Bridges. University of Wales Trinity Saint David. Arts Building, Lampeter Campus. 20th April-18th May 2016. Presentations by Koldo Trapaga Monchet, Beñat Eguiluz Miranda, Adolfo Miguel Martins, Marta Domínguez Delmás, Antonio Rochas, Sara Rich, Ana Rita Trindade,
2. “Os navios ibéricos na expansão europeia: Tipologias e Tonelagens”. Presentation by Prof. Dr. Filipe Castro. Lisboa (Portugal). 31st October 2016.
3. ‘Y al fin fue al Agua’: Formas de provisión de madera y construcción naval para las Armadas Reales en Lisboa (1589-1621)”. Presentation by Koldo Trápaga Monchet, UNLA, 10th November 2016.
4. “La ciudad de Lisboa como puerta hacia el mar: los sucesos de la nau São Roque y la carrera de India (1602-1603)”, Presentation by Koldo Trapaga Monchet, UNLA, January 23 2017
5. The Adventure of the Armadas: An Historical and Archaeological Perspective. CCHS-CSIC. Madrid (Spain), 28 February 2017. Presentation by Ana Crespo Solana and Miguel San Claudio.
6. Building Bridges Seminar, Lampeter Campus – 9 of March, 2016:
 - a. Ali, S. and Martins, A. (2015) Digital Recording in Boat Archaeology.
7. NEXUS conference, Carmarthen Campus – 23/24 of March, 2016:
 - a. Martins, A.; Eguiluz-Miranda, B; Santos, A.; Trapaga Monchet, K and Rich, S. (2016) Multidisciplinary approach in science, how far may we go?
8. Research Cluster Seminars, Lampeter Campus – 11 of May, 2016
 - a. Martins, A. (2015) Engineering and reverse-engineering in wooden shipbuilding: The analysis of data collected from archives and seabed using a 3D CAD approach
9. Global Waters: Sustainability, Harmony and Awareness Day – 3 of October, 2016: Martins, A. and Ali, S (2016) Ships, Trees and Water.
10. Adolfo Martin 3D digital recording and data processing (at Maritime Archaeology Trust) – 13/19 of July 2016

More information in: <http://forseadiscovery.eu/congressesworkshops>

Publications

LIST OF SCIENTIFIC PUBLICATIONS, STARTING WITH THE MOST IMPORTANT ONES

No.	Title / DOI	Main author	Title of the periodical or the series	Number, date or frequency	Publisher	Place of publication	Date of publication	Relevant pages	Is open access provided to this publication ?	Type
1	Natural hazards and building history: Roof structures of Segovia cathedral(Spain) reveal its history through tree-ring research http://dx.doi.org/10.1016/j.dendro.2017.09.002	Marta Domínguez-Delmas, Koldo Trapaga-Monchet, Nigel Nayling, Ignacio García-González	Dendrochronologia	46	Elsevier GmbH		27/09/2017	1-13	No	Peer reviewed
2	Application of FTIR spectroscopy to the characterization of archeological wood dx.doi.org/10.1016/j.saa.2015.07.108	Mohamed Traoré, Joeri Kaal, Antonio Martínez Cortizas	Spectrochimica Acta - Part A: Molecular and Biomolecular Spectroscopy	Vol. 153	Elsevier	Netherlands	01/01/2016	63-70	Yes	Peer reviewed
3	Radiogenic and “stable” strontium isotopes in provenance studies: A review and first results on archaeological wood from ship wrecks http://dx.doi.org/10.1016/j.jas.2017.09.005	Fadi Hajj, Anne Poszewicz, Julien Bouchez, François Guérolle	Journal of Archaeological Science	Vol. 86	Academic Press Inc.	United States	01/10/2017	24-49		Peer reviewed
4	Provenancing East Mediterranean Cedar wood with the ⁸⁷ Sr/ ⁸⁶ Sr Strontium Isotope Ratio dx.doi.org/10.1007/s12520-015-0242-7	Sara Rich., co-authors: S. W. Manning, P. Degryse, F. Vanhaecke & K. van Leeuwen	Archaeological and Anthropological Sciences	1	Springer Verlag		01/05/2015	1-12	Yes	Peer reviewed
5	Differentiation between pine woods according to species and growing location using FTIR-ATR https://doi.org/10.1007/s00226-017-0967-9	Mohamed Traoré; Joeri Kaal; Antonio Martínez Cortizas	Wood Science and Technology	52	Springer Verlag		04/11/2017	487-504	No	Peer reviewed

6	Potential of pyrolysis-GC-MS molecular fingerprint as a proxy of ModernAge Iberian shipwreck wood preservation 10.1016/j.jaap.2017.07.003	Mohamed Tr aoréa,Joeri Kaala, Antonio Martínez Cortizas	Journal of Analytical and Applied Pyrolysis	126	Elsevier		16/07/2017	1-13		Peer reviewed
7	Tree-rings, forest, history and cultural heritage: current state and future prospects of dendroarchaeology in the Iberian Peninsula dx.doi.org/10.1016/j.jas.2015.02.011	Marta Domínguez-Delmás, Reyes Alejano-Monge, S. Van Daalen, E. Rodríguez-Trobajo, I. García-González, J. Susperregui, E. Jansma	Journal of Archaeological Science	Vol. 57	Academic Press Inc.		11/02/2015	180-196	Yes	Peer reviewed
8	Sevilla, puerto y puerta de Europa: la actividad de una compañía comercial flamenca en la segunda mitad del siglo XVI https://doi.org/10.14201/shhmo2016382353386	Germán JIMÉNEZ MONTES	Studia Historica: Historia Moderna	Vol. 38/Issue 2	Departamento de Historia Medieval, Moderna y Contemporánea de la Universidad de Salamanca; Fundación Española de Historia Moderna	Spain	07/12/2016	353		Peer reviewed
9	Shipwreck rates reveal Caribbean tropical cyclone response to past radiative forcing https://doi.org/10.1073/pnas.1519566113	Valerie Troueta, I, Grant L. Harley; Marta Domínguez-Delmás,	Proceedings of the National Academy of Sciences of the United States	113	National Academy of Sciences		22/03/2016	3169-3174	Yes	Peer reviewed
10	Swedish oak, planks and panels:dendroarchaeological investigations on the 16th century Evangelistas altarpiece at Seville Cathedral (Spain). 10.1016/j.jas.2014.11.039	E. Rodríguez-Trobajo; Marta Domínguez-Delmás	Journal of Archaeological Science	54	Academic Press Inc.		04/03/2015	148-161	Yes	Peer reviewed
11	To put a cedar ship in a bottle: Dendroarchaeology of three ancient East Mediterranean watercraft with the ⁸⁷ Sr/ ⁸⁶ Sr isotope ratio http://dx.doi.org/10.1016/j.jasrep.2016.08.034	Sara Rich , Sturt W. Manning , Patrick D. Egryse , Frank Vanhaecke , Kris Latruwe , Karel Van Lerberghe	journal of archaeological science: reports	Vol. 9	Elsevier	United Kingdom	01/10/2016	514-521		Peer reviewed
12	The Newport Medieval Ship, Wales, U	Nigel Nayling	International Journal of Nautical Archaeology	Vol. 43/Issue 1	Blackwell Publishing	United Kingdom	01/09/2014	239-278		Peer reviewed

	nited Kingdom 10.1111/1095-9270.12053	, Toby Jones	ology	sue 2						wed
13	Iberian Dendrochronology and the Newport Medieval Ship. 10.1111/1095-9270.12052	Nigel Nayling, Josué Suspérregi	International Journal of Nautical Archaeology	43.2	Blackwell Publishing		02/09/2014	279-291	Yes	Peer reviewed
14	Tonnages and displacements in the 16th century dx.doi.org/10.1016/j.jas.2012.08.033	Filipe Castro	Journal of Archaeological Science	40	Academic Press Inc.		01/03/2013	1136-1143	Yes	Peer reviewed
	The Wider World: Spatial Expansion and Integration in the Hispanic Atlantic, 16th to 18th centuries	Ana Crespo Solana	Spatio-Temporal Narratives. Historical GIS and the Study of Global Trading Networks (1500-1800)		Cambridge Scholars Publishing	NewCastle upon Tyne	07/09/2014	1-45	No	Article
	The Pepper Wreck as a Case Study for the Portuguese India Route Ships	Castro, F., and Fonseca, C	Shipwrecks around the World: Revelations of the Past		Delta Book World	New Delhi, India	02/03/2015	1-26	No	Article
	Introduction: Forestry, shipbuilding and timber supply in the age of Discovery	Ana Crespo Solana & Nigel Nayling	the management of Iberian Forest Resources in the Early Modern shipbuilding: History and Archaeology		Instituto de Arqueologia e Paleociencias / Pórtico editores	Lisboa, Portugal	15/12/2015	1-5	No	Article
	How can we see trees in timbers? An approach to the Golden Age of shipbuilding	Adolfo Miguel Martins	the management of Iberian Forest Resources in the Early Modern shipbuilding: History and Archaeology		Instituto de Arqueologia e Paleociencias / Pórtico editores	Lisboa, Portugal	15/12/2015	5-17	No	Article
	Atlantic shipbuilding and the Iberian Cantabric transition, 1560-1680	Beñat Eguiliz Miranda	the management of Iberian Forest Resources in the Early Modern shipbuilding: History and Archaeology		Instituto de Arqueologia e Paleociencias / Pórtico editores	Lisboa, Portugal	15/12/2015	17-31	No	Article
	The Armada's wars in the Iberian Northern Atlantic, a chance for ForSEADiscovery project	Miguel San Claudio Santa Cruz	the management of Iberian Forest Resources in the Early Modern shipbuilding: History and Archaeology		Instituto de Arqueologia e Paleociencias / Pórtico editores	Lisboa, Portugal	15/12/2015	39-49	No	Article
	"Resucitando la guerra de la mar": The timber supply as a political problem in the Court of Lisbon (1617-1622)	Koldo Trápaga Monchet	the management of Iberian Forest Resources in the Early Modern shipbuilding: History and Archaeology		Instituto de Arqueologia e Paleociencias / Pórtico editores	Lisboa, Portugal	15/12/2015	49-57	No	Article
	Bourbon naval policy, forestry and timber supply for shipbuilding in Andalucia (1700-1759): brief introductory notes	Ana Rita Trindade	the management of Iberian Forest Resources in the Early Modern shipbuilding: History and Archaeology		Instituto de Arqueologia e Paleociencias / Pórtico editores	Lisboa, Portugal	15/12/2015	57-65	No	Article
	Portuguese India route shipwrecks	Filipe Castro	the management of Iberian Forest Resources in the Early Modern shipbuilding: History and Archaeology		Instituto de Arqueologia e Paleociencias / Pórtico editores	Lisboa, Portugal	15/12/2015	73-87	No	Article

Forest management on Portugal during Early modern ages- analysis of historical documents belonging to the Kingdom of D. Manuel I (15th and 16th centuries)	Antonio Rocha Santos	the management of Iberian Forest Resources in the Early Modern shipbuilding: History and Archaeology		Instituto de Arqueologia e Paleociencias / Pórtico editores	Lisboa, Portugal	15/12/2015	87-92	No	Article
Wood Resources, shipbuilding and Social Environment. The historical context of the ForSEAdiscovery Project	Ana Crespo Solana	Skyllis	52	DEGUWA	Bubenreuth	24/09/2015	52-62	No	Article
Forestry and Timber Supply	Koldo Trápaga Monchet, Antonio Santos	Skyllis	52	DEGUWA	Bubenreuth	24/09/2015	62-68	No	Article
Shipwrecks and Provenance: in-situ timber sampling protocols with a focus on wrecks of the Iberian shipbuilding tradition	Sara A. Rich, Nigel Nayling, Garry Momber, Ana Crespo Solana	Archaeopress		Archaeopress Publishing Ltd,	Oxford, England	31/01/2018	1-76	Yes	Article
A methodology for estimating the volume of Baltic timber to Spain using the Sound Toll Registers: 1670-1806	Nathan Gallagher	The International Journal of Maritime History	28 (4)			02/03/2016	752-773	Yes	Article
Shipbuilding in times of war: Contracts for the construction of ships and provision of supplies in the Spanish Empire in the early Seventeenth century	José Luis Gasch Tomas; Koldo Trápaga Monchet, Ana Rita Trindade	The International Journal of Maritime History	29(1)			16/03/2017	187-192	Yes	Article
ForSEAdiscovery: Génesis y marco histórico-metodológico de un proyecto interdisciplinar en Humanidades	Ana Crespo Solana	A Gestão dos recursos florestais Portugueses na Construção naval da Idade Moderna: História e Arqueologia		Pórtico Librerías / IAP, UNLA	Lisbon	02/03/2016	1-15	Yes	Article
Antecedentes da construção naval em Portugal	Rosa Varela Gomes	A Gestão dos recursos florestais Portugueses na Construção naval da Idade Moderna: História e Arqueologia		Pórtico Librerías / IAP, UNLA	Lisbon	02/03/2016	23-33	Yes	Article
Los inicios de una nación: mercaderes flamencos en Sevilla durante el reinado de Felipe II	Germán Jiménez Montes	Andalucía en el mundo Atlántico moderno. Agentes y escenarios		Editorial Sílex	Madrid	01/03/2016	215-243	No	Article
El pecio de Ribadeo, un excepcionalmente bien conservado pecio español del siglo XVI.	Miguel San Claudio, Raúl González Galero, José Luis	Arqueología Subacuática española		Editorial UCA, Universidad de Cádiz	Cádiz, Spain	05/03/2015	169-179	No	Conference

		Casabán y Filipe Castro								
Molds and architectural signs in the skeleton first construction: a methodology to reconstruct the original hull's shape of the Cais do Sodré shipwreck	Nicolardi, M & Castro, Filipe	International Symposium in Ship and Boat Archaeology		University Amsterdam	amsterdam, The Netherlands	01/06/2016		No	Conference	
ForSEADiscovery. Forest resources for Iberian Empires: Ecology and Globalization in the Age of Discovery (16th-18th centuries)	Ana Crespo Solana, Nigel Nayling	Actas del V Congreso Internacional de Arqueología Subacuática (IKUWA V)		ARQUA. Museo Nacional de Arqueología Subacuática	Cartagena	29/09/2016	896-905	Yes	Conference	
El recurso natural más importante para la construcción naval: una aproximación medioambiental a la historia del comercio de la madera en la edad moderna	Ana Crespo Solana	Árvores, Barcos e Homens na Península Ibérica (Séculos XVI-XVIII),		Portico, UNLA	Lisbon	15/11/2017	1-15	No	Conference	
Os bosques da ira: conflito e resistência entre comunidades locais e a Marinha pelo uso dos recursos florestais andaluzes no século XVIII	Ana Rita Trindade	Árvores, Barcos e Homens na Península Ibérica (Séculos XVI-XVIII),		Portico, UNLA	Lisbon	15/11/2017			Conference	
Iberian Bizcayan shipbuilding and the transition of a transnational network, 1550-1650	Beñat Eguiluz Miranda	Árvores, Barcos e Homens na Península Ibérica (Séculos XVI-XVIII),		Portico, UNLA	Lisbon	15/11/2017		No	Conference	
Portuguese timber imports from the Baltic, 1669-1815: Evidence from Sound Toll Registers Online	Manish Kumar	Árvores, Barcos e Homens na Península Ibérica (Séculos XVI-XVIII),		Portico, UNLA	Lisbon	15/11/2017		No	Conference	
Using Dendrochronology to access forest history in the NW Iberian Peninsula and applicability	Ignacio García González	Árvores, Barcos e Homens na Península Ibérica (Séculos XVI-XVIII),		Portico, UNLA	Lisbon	15/11/2017		No	Conference	
“¿Quién vela por los bosques del Rey? El cuidado de las coutadas y matas reales en Portugal para su conservación y aprovechamiento (1605-1640)”	Koldo TRAPAGA Monchet	Árvores, Barcos e Homens na Península Ibérica (Séculos XVI-XVIII),		Portico, UNLA	Lisbon	15/11/2017		No	Conference	
Trees for Ships. Forest Decrees from the Kingdom of D. Manuel I until the Kingdom of D. Filipe II (1495-1598)	Antonio Santos	Árvores, Barcos e Homens na Península Ibérica (Séculos XVI-XVIII),		Portico, UNLA	Lisbon	15/11/2017		No	Conference	
A representação de barcos nos azulejos por	Rosa Varela,	Árvores, Barcos e Homens na Península Ibérica (Séculos XVI-XVIII),		Portico, UNLA	Lisbon	15/11/2017		No	Conference	

	tugueses da Idade Moderna.	Mariana Almeida, Filipe Castro	érica (Séculos XVI-XVIII),							
	RECONSTRUCTING TREES FROM SHIP TIMBERS: DATA ANALYSIS AND SCHEMATICS	Adolfo Miguel Martín	Árvores, Barcos e Homens na Península Ibérica (Séculos XVI-XVIII),		Portico, UNLA	Lisbon	15/11/2017	63-77	Yes	Conference
	BELINHO 1: REGISTO E ANÁLISE PROVISÓRIA ÀS MADEIRAS DO NAVIO	Adolfo Miguel Martín, Nigel Nayling, Filipe Castro	Árvores, Barcos e Homens na Península Ibérica (Séculos XVI-XVIII),		Portico, UNLA	Lisbon	15/11/2017	181-193	No	Conference
	CARAVELS	Filipe Castro	Árvores, Barcos e Homens na Península Ibérica (Séculos XVI-XVIII),		Portico, UNLA	Lisbon	15/11/2017	193-211	No	Conference
	La reconfiguración política de la Monarquía Católica: la actividad de Don Juan José de Austria (1642-1679)	Koldo Trápaga Monchet			Universidad Autónoma de Madrid / Consejo Superior de Investigaciones Científicas	Madrid Spain	04/09/2015		No	Thesis
	FOREST HISTORY, TIMBER SUPPLY AND TREE RINGS. A dendroarchaeological approach to the study of Iberian cultural heritage	Marta Domínguez-Delmás			Universidad de Huelva	Huelva, Spain	02/12/2015		No	Thesis
	Use of stable and radiogenic strontium isotopes to trace the origin of woods: application to wood from shipwrecks	Fadij Haj			University of Lorraine	Nancy	14/11/2017		No	Thesis
	El Atlántico Norte Español. Un espacio estratégico para un imperio. Siglo XVI. Una visión arqueológica	Miguel San Claudio Santa Cruz			Universidad de Zaragoza	Zaragoza, Spain	26/01/2018		No	Thesis

Section B (confidential) - EXPLOITABLE FOREGROUND AND PLANS FOR EXPLOITATION

LIST OF APPLICATIONS FOR PATENTS, TRADEMARKS, REGISTERED DESIGNS, UTILITY MODELS, ETC.

Type of IP Rights	Confidential	Foreseen embargo date dd/mm/yyyy	Application reference(s) (e.g. EP123456)	Subject or title of application	Applicant(s) (as on the application)
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OVERVIEW TABLE WITH EXPLOITABLE FOREGROUND

Type of Exploitable Foreground	Description of Exploitable Foreground	Confidential	Foreseen embargo date dd/mm/yyyy	Exploitable product(s) or measure(s)	Sector(s) of application	Timetable for commercial use or any other use	Patents or other IPR exploitation (licences)	Owner and Other Beneficiary(s) involved
General advancement of knowledge	The ForSEAdiscovery Data model and GIS; Historical GIS on Iberian Shipwrecks:	Yes	01/12/2021	Potential use of database in Heritage and Nautical Archaeology / Historical Heritage and Culture	Heritage/ Nautical Archaeology, Underwater Heritage	4 years	N/A	CSIC/ TAMU /USC / UWTSD ForSEAdiscovery Consortium
General advancement of knowledge	Historical Forest Database and Cartography. The reason of the completion of this database is the integration and sharing of historical information specific areas in Iberian Peninsula where oak and pine wood was logged to supply specific Iberian shipyards with timber for shipbuilding from the 16th-18th centuries.	Yes	30/01/2021	N/A	Forestry, Environmental History, Wood Provenance	N/A	N/A	CSIC The ForSEAdiscovery Consortium
Commercial exploitation of R&D results	Tree-ring width chronology for: a) Oak tree-ring chronologies for Northern Spain (Cantabrian range)b) Pin	Yes	01/03/2021	Potential use by tree-ring laboratories for contract research e.g. commercial dating service	Heritage	N/A	N/A	USC / The ForSEAdiscovery Consortium

	e (<i>P. sylvestris</i> , <i>P. nigra</i>) tree-ring chronologies for Central and Southern Spain c) Anatomical chronologies of oak (early wood vessel size) for Northern Spain d) Blue intensity chronologies of pine (<i>P. sylvestris</i> , <i>P. nigra</i>) for Central and Southern Spain							
General advancement of knowledge	WEB Mapping, ForSEAdiscovery Naval History and Underwater Archaeology Data service	Yes	01/03/2021	The Web mapping and Data service will be the core part of a Spatial Data Infrastructure (SDI) about Underwater Heritage and History	Underwater Archaeology, Heritage	possible application in SDI	N/A	CSIC / The ForSEAdiscovery Consortium

ADDITIONAL TEMPLATE B2: OVERVIEW TABLE WITH EXPLOITABLE FOREGROUND

Description of Exploitable Foreground	Explain of the Exploitable Foreground
The ForSEAdiscovery Data model and GIS; Historical GIS on Iberian Shipwrecks:	GIS application design concerning Iberian shipwrecks between XVI-XVIII centuries has been developed on the context of ForSEAdiscovery project. The overall research goal is to investigate the wood provenance and shipbuilding and to determine if there some pattern for the Iberian ship definition. In particular, we have focused on the study of Iberian shipwrecks to locate ancient ships of this period and collect underwater timber samples. Later, they will analyze with several dendro-archaeological analyses and so we could determine and know the origin of timber and forests, the influence of shipbuilding, and trade routes in the Age of Discovery and European expansion. In order to achieve that, a new approach was developed for mapping the historical data of ships and shipwrecks database. I contain also: The Early Modern Shipwrecks Interactive Database is developed by Filipe Castro (Anthropology Department) and Cecilia Smith (Maps & GIS, University Libraries) of Texas A&M University, and the Galician Seas Finisterre-Shipwrecks: Galician Seas Finisterre is oriented to value the underwater heritage of the Spanish northwest and, specifically, project of shipwrecks throughout history in waters of the Costa da Morte between Fisterra and Porto do Son. As a result, the ForSEAdiscovery database and GIS integrate information about Iberian Shipwrecks and historical data with geolocalization. The final Database will be accessible via the Digital Repository of the CSIC.
Historical Forest Database and Cartography. The reason of the completion of this database is the integration and sharing of historical information specific areas in Iberian Peninsula where oak and pine wood was logged to supply specific I	The database is the core of a future project that relates Underwater Heritage, Environmental History and Wood Provenance. This database contains, at the moment, historical information from Spanish Archives about timber supply and is concentrated in early modern Andalucia. The importance of this experimental database is that it has been the opportunity to design and create a conceptual model, a type of abstraction that uses logical concepts and hides the details of implementation and data storage. They offer powerful concepts to the designers that provide getting the most complete specification from the real world. They are able to represent the real world through entities with its attributes and relations between them. The information included: a) Scanning and Digitizing Map Data: The process consists of a collection of data compiled (i.e. from historical maps) and formatted into digital format. b) Creation a Geodatabase: Geodatabases have a comprehensive information model for representing and managing geographic information. This comprehensive information

<p>berian shipyards with timber for shipbuilding from the 16th-18th centuries.</p>	<p>model is implemented as a series of tables holding feature classes, raster datasets, and attributes in a Geographic Information System. c) GIS: Implementation of the geodatabase in a GIS. GIS application of Iberian Forests will be developed. We will create layers from the geodatabase data and use the spatial data infrastructures (SDI). It will allow to exchange and sharing of spatial data between public organization and agency of spatial data community. IDE: http://www.idee.es/web/guest/inicioIDE magrama: Data%20Infrastructure%20(SDI)%20of%20the%20Ministry%20of%20Agriculture,%20Food%20and%20Environment%20(magrama)">http://www.magrama.gob.es/es/cartografia-y-sig/ide/Spatial Data Infrastructure (SDI) of the Ministry of Agriculture, Food and Environment (magrama), integrates data, metadata, services and geographic information such competence of the Ministry, according to the specifications of the Open Geospatial Consortium (OGC). Aligning itself with the objectives of the European Directive (INSPIRE) and Spatial Data Infrastructure of Spain (IDEE). d) CARTOGRAPHY: Thematic maps (Mapping of thematic maps using GIS application of Iberian Forests, they will display in maps depending on the spatial pattern of a theme or series of attributes); Scale (global map, by regions,...); Layers (forests) or attributes (oak, pine,..). This Datamodel design is applicable to another regions of Iberian Peninsula and the ForSEAdiscovery Consortium aim to develop the GIS and database in future projects. This analysis will let us, in the close future, to include attribute, Spatial and Temporal Analysis. From the GIS layers we can make different analysis: attribute, spatial and temporal. It involves applying algorithms or scripts to the layers in function of what we want to know about one entity or geographic object. The results are shown in maps, tables or graphics. Some possible results will be Statistics data; spatial relations and temporal evolution of one or more parameters in a specific site or region. An example of analysis will be show the evolution of a phenomenon (Iberian forests) through the comparative maps along the time. The innovation consist in that is the first time that both Social and Life Sciences can give answer to Environmental problems as a consequences of the historical timber supply for shipbuilding in the Iberian Empires (16th-18th centuries). This data base is under embargoes of three year until fellow PhD completion.</p>
<p>Tree-ring width chronology for: a) Oak tree-ring chronologies for Northern Spain (Cantabrian range)b) Pine (<i>P. sylvestris</i>, <i>P. nigra</i>) tree-ring chronologies for Central and Southern Spain c) Anatomical chronologies of oak (earlywood vessel size) for Northern Spain d) Blue intensity chronologies of pine (<i>P. sylvestris</i>, <i>P. nigra</i>) for Central and Southern Spain</p>	<p>Dendrochronological data sets produced during the ForSEAdiscovery project consist of ring-width measurements of oaks and pines obtained from living trees and historical buildings. Oak chronologies are restricted to the Cantabrian area (Northern Spain), including the regions of Euskadi, Cantabria, and Asturias. Oak trees belonged to several deciduous species (<i>Quercus robur</i>, <i>Q. petraea</i>, <i>Q. pyrenaica</i>, and <i>Q. faginea</i>), and constitute a total of 16 site/species chronologies, plus 121 series from buildings, which in total go back to 1326. Pine chronologies correspond to two different species (<i>Pinus sylvestris</i>, <i>P. nigra</i>) from Central and Southern Spain, reaching the 12th century, distributed in 10 site/species chronologies. In addition, series of earlywood vessel size were developed for living oaks, and minimum blue intensity time series for pines are also available at six sites. These data are of broad usefulness, especially the ring-width chronologies. Data available could be used in the private sector for dating/provenancing purposes. Future use for further research, especially in areas of climatology and ecology, is also of great potential for both general knowledge and applied research. Methods developed by FT-IR can be also subject of commercial exploitation, especially for identification of the origin and species of the wood. The protocols, however, need still to be standardized.</p>
<p>WEB Mapping. ForSEAdiscovery Naval History and Underwater Archaeology Data service</p>	<p>Archaeological and historical data on global commerce, people involved in trading activities, sailing routes, ports or shipwrecks information will be accessible in a joint approach, linked by their spatial and chronological quality. Two main courses of action have been undertaken to guarantee open access to these public research data: • Online data visualization. A web site has been developed with standard web technology to enable interactive access to a wide, not necessarily specialized audience. It displays two main datasets: historical routes and ports with trading information, and shipwrecks gathered through archaeological and historical sources with information regarding archaeological campaigns and historical sources. •Standard web services. The set up of a web map service arranging several layers to display the same information as the online viewer will constitute a standard interface to the project's data. ISO and OGC (Open Geospatial Consortium) specifications compliance will enable interoperability, direct GIS integration for any remote desktop user and reutilization from other web-based platforms</p>

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3. SCIENTIST IN CHARGE QUESTIONNAIRE

RESEARCH TRAINING ASSESSMENT:

What is the size of the hosting research group?	3000
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How many researchers have you supervised, within the past 10 years? Of which funded by:

EC/Marie Curie actions	2
EC Other Funding	4
University fellowships	4
National public bodies	4
Industry	
Other	

Other, please specify:

How many researchers have you supervised within this project?	18
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Corresponding to how many person months?	426
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Number of publications resulting directly from the research project:

Recruited researcher(s) and yourself	44
Recruited researcher(s) alone	18
Recruited researcher(s) with authors other than yourself	

Participation of the recruited researcher(s) at conferences (number):

Passive	38
Active	19
How do you rate the overall success of the research training?	Very good

General assessment:

RESEARCHERS ASSESSMENT:

Rate the overall level of the recruited researcher(s) integration in the research team and the host organisation with regards to:

participation in meetings/seminars	Very good
discussions of results and project-related topics	Very good
co-operation with other team members	Very good
co-operation with other researchers of the host institution	Very good

Rate the overall performance of the recruited researcher(s) with regard to:	
originality of fellow(s) approach towards research (initiative/independent thinking)	Very good
capacity to develop new skills and to benefit from training	Very good
productivity (research results/publications/international conference attendance)	Very good
communication skills	Very good
group leader skills (collaboration with other groups/project management)	Very good
training and/or teaching skills	Very good

Comment:

RESEARCH TRAINING OUTCOMES:

Has this project provided additional links with other research groups or institutions?	Yes
If yes, indicate the number of contacts in each case	
Universities	12
Research Centres	6
Industry/private companies	9
Others	2

If Other, please specify:

The ForSEAdiscovery consortium and team have developed research collaboration and activities with Universities, Internacional Association (as DEGUWA, IKUWA, etc.) and with commercial sector.

DEGUWA is the German Association of Nautical Archaeology

IKUWA Is the International Asociacion of Underwater Archaeology

ForSEAdiscovery is promoting and fostering new scientific collaborations. The research is set in a complex scenario that goes beyond the capacity and expertise of any single institute or laboratory, therefore the establishment of multidisciplinary, multi-site approaches through a network is a necessity. Some of the partners have already collaborated or have on-going collaboration projects (see table) which are supported either by national or EU funding. ForSEAdiscovery starts thus from a previous level of collaborative research. Consolidating this multidisciplinary, international research network will increase the chances of further national and international funding, thus creating possibilities for follow-up research as well as training opportunities for young researchers.

We intend to extend our collaboration to future calls within Framework Programmes, expecting to achieve a ForSEAdiscovery network of laboratories, institutes and companies with different perspectives and common goals to train future researchers. In this way, we anticipate a long-term effect of ForSEAdiscovery to attract funding.

Rate the importance of the following outcomes of the research training:

results of the research	Very good
number of publications	Very good
development of research	Very good
establishment of international collaborations	Very good
transfer of knowledge/technology	Very good
training of students/researchers	Very good
further academic qualifications (PhD, habilitation etc.) for fellows	Very good

Comments:

YOUR OPINION ABOUT THE MARIE CURIE ACTIONS:

Comments:

My opinion as coordinator is that the EU rules are very strict. Moreover they have to be matched with evenly strict and very diverse rules at the various EU partner institutes. The main interest of all of us, EU program managers and partners in EU projects, should be to get the maximum out of a project as for education, science and cooperation (science & stakeholders outside science). To guarantee that this is happening we need the best candidates in the right position.

A suggestion to improve the recruitment process would be to get more flexibility with respect to the rules. Rules have to be obeyed in general but efficiency (scientific and societal output/relevant) should be the ruling factor.

Did you have previous knowledge of the Marie Curie actions? Yes

If yes, what sort of image do you think that the Marie Curie actions have among the scientific community in your research area?

Very good

Attachments	
Name	
Date	

This declaration was visaed electronically by Ana CRESPO SOLANA (ECAS user name nresana) on