

The international workshop “Maritime networks in space and time” (Paris, 16-18 June 2014) is probably the first event of the kind, diverting from the classic maritime conferences held in history, economics, and geography for instance. Gathering about 50 researchers coming from 10 countries, it has brought together 34 contributions from a vast array of scientific disciplines, namely archaeology, history, geography, regional science, economics, planning, geomatics, computer science, physics, mathematics, and engineering. Their common objective was to propose an empirical analysis of maritime flows, whatever the geographic scale and the time period under consideration. The workshop itself was organized and funded in the framework of the World Seastems project supported as Starting Grant No. 313847 by the European Research Council (ERC) over the period 2013-2018 (see *PORTUS* No. 26, www.portusonline.org) [1]. Fruitful exchanges and discussions have proven the challenge to be highly successful, and an edited book volume is under preparation. Promising collaborations are already taking place among the participants.

While summarizing the findings of every paper would run beyond the scope of this review, it is certainly wiser to attempt drawing the lessons of this workshop through a transversal analysis. First of all, we have learned about the wide diversity of possible sources that can be used to map, visualize, and measure the architecture of maritime networks and the connectivity of ports and places in such networks: archaeological records, customs data, newspapers, origin-destination statistics, customs, carrier schedules, ship logs, vessel movements, and AIS data to name but a few. Various methods of route and network modeling were applied to all of these sources, notwithstanding important issues of data collection and extraction, especially from historical documents, but also in terms of cost, for more recent data, which is often impeding empirical applications.

Secondly, another finding is the vast diversity of research domains and questions raised by such analyses: climatology, linguistics and genealogy, environmental studies, globalization-urbanization studies, but also others looking at route densities, modal interdependencies, topological vulnerabilities, seasonality effects, piracy and security issues in maritime flows. Despite this diversity, scholars have been able to communicate beyond their traditional disciplinary belongings as many of them could speak the same language in terms of cartography, Geographical Information Systems (GIS), complex systems, network theory, spatial analysis, emergence and resilience, polarization and diffusion, trajectories and patterns, modeling and simulation, etc. This is exactly under such a multidisciplinary

perspective that the workshop was introduced, by four keynote speakers respectively in geography, historical geography, history, and physics. They particularly stressed the importance of actors' strategies in shaping their networks, but also the difficulty to reach serious conclusions without a solid empirical analysis of maritime (or other transport and mobility) flows, especially in a dynamic manner and based on a sufficiently large amount of information (cf. big data, data mining).

Thirdly, the workshop was proposing everything but a technical, socially disconnected approach to such flows. In most papers, the mobilized concepts and methods were most of all serving the understanding of territories, actors, and societies at all levels of analysis: ports and terminals, cities and regions, nation-states and continental powers, operators and merchants, trade and value, as well as the world economy in general and how it is supported (but also influenced) by maritime interactions. From the most local to the most global, all papers had in common to raise a number of key societal issues in relation to maritime transport.

Fourthly, there has been a relatively good balance among papers in terms of geographic coverage and time periods. A large number of world-scale approaches (10 papers) was proposed as well as case studies of the connectivity of particular ports and port cities (Venice, Philadelphia, Rotterdam, Hamburg, and Antwerp), countries and large regions (Pearl River Delta, China, the Mediterranean basin, East Asia, Mexico, Canada, Eurasia, Northwest Europe, the Korean peninsula, Southern Pacific, and the Arctic). While some contributions were dedicated to ancient periods such as pre-historical, Roman antiquity, Medieval and Modern times, the more contemporary studies remained very diverse, looking for instance at the daily connectivity of the global container shipping network in recent years, or at the changing pattern of maritime flows across several decades within the 20th century.

The poster of International Workshop.

Papers drawn from the World Seastems project itself could present for the first time preliminary results on the evolution of global and Mediterranean maritime flows between 1890 and 2008. They particularly stressed that the recent trend towards network centralization and rationalization would in fact prolong a longer one dating back from the age of steamers, thus putting in question the “rupture” that is believed to have occurred due to containerization, in terms of port selection and concentration.

Although many types of shipping have been examined overall, from the age of sail to containerization, it is perhaps a pity that certain markets have been ignored, such as passengers (ferry, cruise, ro-ro), river-canal, and short-sea shipping. Another lack is the absence of papers focusing specifically on ship routing, fleet management, network design, and scheduling, but such approaches are already much developed in handbooks of

operational research and related conferences that touch a different audience outside social sciences and humanities. It is recommended also that more empirical works are done about the impact of (geo)political change on maritime network configuration, which seems to be a promising research direction, just like the influence of local socio-economic characteristics on the nature and extent of maritime connectivity, and the more systematic comparison between maritime networks and other types of networks embedded in space and time (e.g. transport, trade, migration, telecommunications, agreements...).

Notes

[1] www.world-seastems.cnrs.fr

List of contributions (by order of appearance)

We also included a link to the related database, project, laboratory whenever possible:

Frémont A., Shipping line networks, keynote presentation.

Gipouloux F., Merchant networks in the 'Asian Mediterranean', keynote presentation. <https://urbachina.hypotheses.org/>

Bretagnolle A., City networks and transportation systems on the long-term period (13th-21th centuries), keynote presentation.

Barthélémy M. Spatial networks, keynote presentation.

Rivers R., Knappett C., Evans T., How technology and geography influence network dynamics.

Meeks E., Grossner K., Scheidel W., ORBIS: First of many worlds?

<https://orbis.stanford.edu/>

Fournier M., Rochat Y., Kaplan F., Modeling Venice's maritime network - End 13th to Mid. 15th centuries.

Marzagalli S., Navigocorpus. A database for shipping and trade.

<https://navigocorpus.org/>

Hein C., Networks of oil and water: Pennsylvania's global petroleum industry and its urban footprint in Philadelphia (1860s-2014).

Lobo-Guerrero L., Stobbe A., 'Knots', port authorities and governance: comparing the governance of port connectivity in three major European ports.

Haule S., Ait-Mohand K., The complex corpus of Lloyd's List periodicals: from collection to extraction.

Ducruet C., Haule S., Mareï N., A review of other maritime databases as sources for research.

Mareï N., Changing Mediterranean maritime networks.

Joly O., Polarization of oceanic areas and shape of the global network of shipping containerized traffic at the dawn of the 1990s.

Ducruet C., Marnot B., Network structure and regional distribution of global maritime flows (1890-2010).

Medda F., Caschili S., The multiplier attachment: A shipping network architecture.

Halim R., Tavasszy L., Modelling the emergence of world's direct shipping lines: An uncertainty analysis.

Guinand F., Pigné Y., Random walks in dynamic maritime networks.

Gastner M., The complex network of cargo ship movements and its importance in marine bioinvasion.

Lhomme S., Maritime network vulnerability to cascading failures.

Roussin S., Maritime network evolution under crisis: The case of North Korea.

Lee S.W., Impacts of Northern Sea Route on natural resources logistics map in East Asia: South Korea's case.

Guerrero D., Explaining international trade flows with shipping-based distances.

Alix Y., Pelletier J.F., Think inside the box.

Bouveyron C., Latouche P., Zreik R., Stochastic blockmodeling applied to global maritime flows.

Etienne L., Devogele T., Maritime trajectory patterns.

Etienne L., Arctic shipping analysis.

Janatka M., Jindani J.A., Presentation of the Vessel Value company. <https://www.vesselsvalue.com/>

Duszinski J., Mary J.F., Audièvre L., Mus M., The Weastflows Project: freight transport spatial interactions and territorial dynamics in North West Europe.

<https://www.weastflows.eu/fr/>

Verny J., Chaze M., The Eurasian railway corridor and Lower Seine Valley ports: competition or complementarity?

Lugo I., Modeling a system of cities based on spatial networks.

Wang L., Yang L., The British and Japanese shipping network in China in 1920s.

Tam K.C., Ng A.K.Y., Canton-Hong Kong-Macau: A historical review on the intercity competitions and interactions of the three commercial centers of the Pearl River Delta before the 20th century.

Leymarie P., A geospatial analysis of maritime piracy and its challenges. <https://www.unitar.org/unosat/fr/piracy>

A list of abstracts can be found at:

https://www.world-seastems.cnrs.fr/pdf/ERC_WS_Workshop_2014_06_programme-abstracts_final_version.pdf

Head image: A moment of the workshop dedicated to “Maritime networks in space and time” which was attended by 50 researchers coming from 10 countries.