



Aquatic mammal science in Latin America: a bibliometric analysis for the first eight years of the *Latin American Journal of Aquatic Mammals* (2002-2010)

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Abstract

We conducted a meta-analysis of the publication statistics for Vols. 1-8 of the *Latin American Journal of Aquatic Mammals* (LAJAM), the joint scholarly publication of the *Sociedad Latinoamericana de Especialistas en Mamíferos Acuáticos* and the *Sociedad Mexicana de Mastozoología Marina*, with the goals of: (a) identifying the main patterns in the authorship and content published between 2002 and 2010, and (b) assessing the contributions of these scientific societies in the Latin American and global contexts. With the caveat that the results are only representative of the researchers that chose to publish in LAJAM during the period covered by the study, the metadata from 168 articles indicated that most of the research was conducted on small odontocetes (*Sotalia*, *Pontoporia*, *Tursiops*) and pinnipeds (*Arctocephalus*, *Otaria*, *Mirounga*) of coastal habits. Rorqual whales (*Balaenoptera*, *Megaptera*) and oceanic odontocetes (*Stenella*, *Mesoplodon*, *Orcinus*, *Delphinus*) also were well represented. Studies of distribution (including first records) were the most common, followed by those related to feeding, strandings, health and bycatch. Seventeen countries were represented in the primary affiliation of the lead author, but just five dominated the contribution: Brazil (52%), Argentina (10%), México (7%), Uruguay (5%) and USA (5%). Among institution types, a university was reported as the primary affiliation type by 50% of the authors, while 26% reported a NGO, 17% a government agency and 7% another type of organization. A social network analysis of 404 authors identified a large, well-connected cluster of 263 authors. Within this cluster, 13 authors from Brazil, Perú, Argentina and Colombia were among the most collaborative. The female to male ratio was 1:1.6 among lead authors and 1:3.2 among lead authors that published more than one article, suggesting a gender disparity within this scientific community. According to *Google Scholar*[™], 91 articles in LAJAM were cited in other publications through January 2012, with an average of 7.5 citations per article. The 15 most cited articles had between 13 and 15 citations, were predominantly from Brazil, and were mainly about small cetaceans.

Resumen

Realizamos un meta-análisis de las estadísticas de publicación de los Vols. 1-8 del *Latin American Journal of Aquatic Mammals* (LAJAM), la publicación científica conjunta de la *Sociedad Latinoamericana de Especialistas en Mamíferos Acuáticos* y de la *Sociedad Mexicana de Mastozoología Marina*, con los siguientes propósitos: (a) identificar los principales patrones de autoría y contenido publicados entre 2002 y 2010, y (b) evaluar las contribuciones de estas sociedades científicas en el contexto latinoamericano y global. Con la salvedad que los resultados solamente son representativos de aquellos investigadores que escogieron publicar en LAJAM durante el período del estudio, los metadatos de los 168 artículos indicaron que la mayoría de la investigación se realizó con pequeños odontocetos (*Sotalia*, *Pontoporia*,

Tursiops) y pinnípedos (*Arctocephalus*, *Otaria*, *Mirounga*) de hábitos costeros. Ballenas rorcuales (*Balaenoptera*, *Megaptera*) y odontocetos oceánicos (*Stenella*, *Mesoplodon*, *Orcinus*, *Delphinus*) también estuvieron representados. Estudios de distribución (incluyendo primeros registros) fueron los más comunes, seguidos por aquellos acerca de alimentación, varamientos, salud, y captura incidental. Diecisiete países estuvieron representados en la afiliación del primer autor, pero la contribución estuvo dominada por tan solo cinco: Brasil (52%), Argentina (10%), México (7%), Uruguay (5%) y EEUU (5%). El 50% de los autores reportó una universidad como su afiliación principal, mientras que 26% reportó una ONG, 17% una agencia del gobierno y 7% otro tipo de organización. Un análisis de redes sociales de los 404 autores indentificó un núcleo principal de 263 autores bien interconectados. Dentro de este grupo, 13 autores de Brasil, Perú, Argentina y Colombia contribuyeron mayoritariamente a la dispersión de la información. La proporción de mujeres a hombres fué 1:1.6 para primeros autores y 1:3.2 para primeros autores que publicaron más de un artículo, lo que sugiere una disparidad de género en la comunidad de investigadores. De acuerdo a *Google Scholar*[™] 91 artículos aparecidos en *LAJAM* han sido citados en otras publicaciones a enero de 2012, con un promedio de 7.5 citas por artículo. Los 15 artículos más citados tienen entre 13 y 51 citas, provienen mayoritariamente de Brasil, y fueron predominantemente sobre pequeños cetáceos.

Introduction

The *Latin American Journal of Aquatic Mammals (LAJAM)* is the scholarly publication of two scientific societies: the *Sociedad Latinoamericana de Especialistas en Mamíferos Acuáticos (SOLAMAC)* and the *Sociedad Mexicana de Mastozoología Marina (SOMEMMA)*. Its aim is 'to promote and disseminate scientific knowledge concerning aquatic mammals and their environment in Latin America'. While this aim is primarily directed at authors and readers, *LAJAM* also contributes to the strengthening of Latin America's scientific community by recruiting qualified researchers from the region as Associate Editors or as peer reviewers and, more generally, by fostering the global exchange of information.

LAJAM began publishing in 2002, and by 2010 it had published eight volumes comprising 13 issues. Starting with the 2011 issue the journal ceased its print version and began publishing in an online, electronic format. This important transition to online publication motivated us to conduct an evaluation of the trends and patterns in publication in order to assess our contributions as a scientific community within the Latin American and global contexts. Looking forward, we also hoped that this review would be useful to researchers and to institutions in their future allocation of efforts and in the identification of research and management priorities. Indeed, as the pressure to measure researcher productivity, prominence and impact mounts (*e.g.* Ball, 2007; Laloë and Mosseri, 2009), the analysis of bibliometric data is becoming increasingly employed as a diagnostic tool in the biological sciences (*e.g.* Moustakas and Karakassis, 2005; Cameron, 2008; Hendriks and Duarte, 2008; Caliman, 2009; Calver and Bradley, 2010; Powell et al., 2010; Milner-Gulland et al., 2012).

Based on the *LAJAM*'s output for the period 2002-2010, we sought to address the following questions: what were the most studied species and research topics? What was the scientific contribution by the different Latin American

countries? How was this contribution allocated among institutions? Which researchers contributed the most and how collaborative were they? Was there a gender bias in the proportion of articles authored by females *versus* males? What was the global impact and relevance of the journal's output? In answering these questions, we stress that this review is not intended to provide an assessment of the reputation or the productivity of individual researchers, their organizations or their countries (such metrics can be obtained from sources such as *Thomson Reuters' Web of Science*[™], *Google Scholar Citations*[™], *ResearchGate*[™], etc.), but rather to identify and synthesize patterns in the content published in the journal so far. Indeed, considering *LAJAM*'s recent appearance and incipient ranking among scholarly publications, the results of this study should be primarily considered a reflection of the level of engagement among researchers within our scientific societies.

Methods

Metadata were extracted for each one of the 168 articles published in *LAJAM* in the 2002-2010 period and entered into an 'article database,' including author names, affiliation, country (and state in the case of Brazil, which had sufficient data for a within-country analysis), article type, and number of pages. Article type was one of eight published by *LAJAM*: 'editorial', 'workshop reports', 'reviews', 'articles', 'notes', 'short communications', 'comments', and 'in memoriam'. We derived additional variables for each article, including the number of authors, the type of institutional affiliation of the lead author, the species studied, and up to three terms descriptive of the research topic from a prescribed list. The type of institutional affiliation was one of: university, government agency, nongovernmental organization (NGO), and other (*i.e.* private associations, consulting firms, or independent scientists). We produced basic metrics, summary statistics, and visualizations from these data, using the R software

version 2.15.1 (Ihaka and Gentleman, 1996; R Core Team, 2012¹), and the add-on packages *ggplot2* (Wickham, 2009) and *wordcloud* (Fellows, 2013²). We present these results in tabular and graphical form, including a regional map of the number of articles by country to visualize the geographic distribution of the contributions and of the affiliation patterns. A similar map at the state level also is presented for Brazil. These maps were produced using ArcGIS 9.3.

We also generated a separate ‘author database,’ consisting of unique author name, gender (determined by the first name), and number of articles published by order of authorship. We identified the most contributive authors from this database, based on authorship or co-authorship in three or more articles, regardless of authorship order (*i.e.* contribution was gauged in terms of recurrence). We further conducted a social network analysis using the R add-on package *igraph* (Csardy and Nepusz, 2006), with the purpose of exploring the relations among authors. This involved using the article and the author databases together to extract a list of ‘traits’ (also known as ‘nodes’ or ‘vertices’) with the name of each author along with other metadata (*i.e.* occurrence as lead author or co-author, gender, and country), and an ‘edges’ list containing the set of all pairwise associations (or ‘ties’) between lead authors and co-authors. Since this analysis is based on the patterns of co-occurrence, authors of articles with no co-authors (and not appearing as co-authors in other articles) were eliminated in this process, although these were very few. The traits and edges lists were represented visually in a social network diagram showing the patterns of association between lead authors and co-authors (*i.e.* a ‘directed’ network). We computed metrics designed to assess the relative quality and importance of each lead author (node) in the network, including: closeness, coreness, degree centrality, betweenness centrality and eigenvector centrality. The reader is referred to Newman (2010) for further details of these metrics. An additional metric was derived by computing the residuals from a simple linear regression model of eigenvector centrality as a function of betweenness centrality, to detect any strong outliers in this relationship, which would indicate authors deserving further investigation.

Finally, to measure the impact and relevance of the journal’s output we obtained the number of citations in the scientific literature for each article using *Google Scholar*TM. For this purpose, we ran an online search on 7 January 2012 using the ‘Advanced Search’ facility in *Google Scholar*, specifying ‘*Latin American Journal of Aquatic Mammals*’ in the publication field, and selecting ‘Biology, Life Sciences,

and Environmental Science’ in the subject area. A table with the top 15 most-cited articles in *LAJAM* was created based on this output.

Results

Journal Output

For the period 2002-2010 there were 168 articles published in eight volumes and 13 issues, comprising 1229 pages of the journal. This excludes non-article pages; *i.e.* those used for the masthead, the Editorial Board membership list, the instructions for authors, etc. The average number of pages per issue, excluding non-article pages, was 94 (range = 51-180, median = 82) and the average number of articles per issue was 13 (range = 8-24, mode = 10, median = 10). The first issue (Vol. 1, No. 1, 2002, a special on franciscana, *Pontoporia blainvillei*) contained the largest number of articles (24 articles, 180 pages). The last two printed issues of the journal (Vol. 7, Nos. 1-2, 2009, a regular issue; and Vol. 8, Nos. 1-2, 2010, a special on *Sotalia*) were double issues and contained 19 articles (88 pages) and 22 articles (175 pages), respectively. There was not a trend over time in the number of published articles per issue once this number was corrected by the total number of pages per issue (Fig. 1).

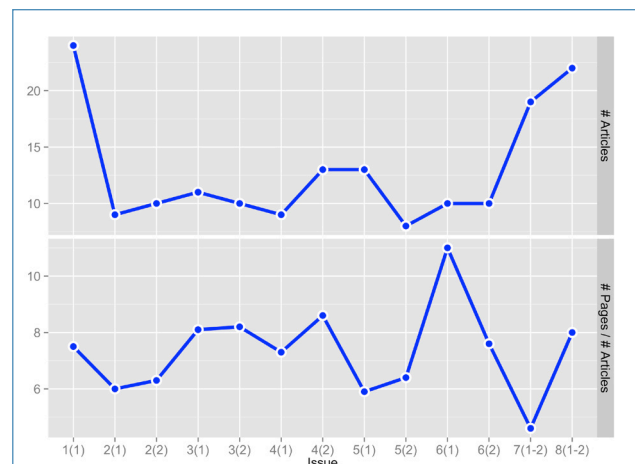


Figure 1. Number of published articles per issue (top) and the number articles as a proportion of the total number of pages per issue (bottom) for the eight volumes and 13 issues published in *LAJAM* during the period 2002-2010.

The average number of pages per article was 7.4 (range = 1-36, mode = 4, median = 6). Of the eight types of article types published in *LAJAM*, articles, notes, and short communications made up the majority (86.9%; Fig. 2, top panel). The average number of pages by article type was highest for reviews (25 pages, n = 3), followed by articles (9.3 pages, n = 86), and workshop reports (7.4 pages, n = 12) (Fig. 2, middle panel). The average number of authors by article type was highest for reviews (12.7, n = 3) and workshop reports (8.5, n = 12), and similar for articles, notes and short communications (3.7, 4.7 and 3.1, respectively) (Fig. 2, bottom panel).

¹ R Core Team (2012) R: A *Language and Environment for Statistical Computing*. R Foundation for Statistical Computing, Vienna, Austria. [Available at <http://www.R-project.org/>, accessed on 3 June 2013].

²Fellows, I. (2013) *wordcloud: Word Clouds*. R package version 2.4. [Available from: <http://CRAN.R-project.org/package=wordcloud>].

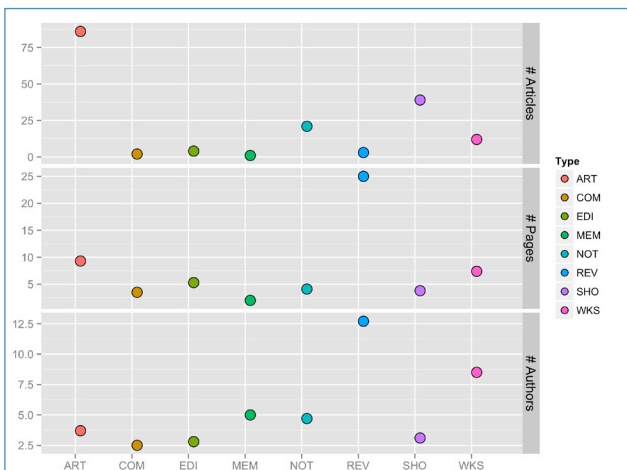


Figure 2. Composition of the journal's output by article type: total number of articles (top), average number of pages (middle), and average number of authors (bottom), based on 168 articles published in *LAJAM* during the period 2002-2010. Article types are: ART = article, COM = commentary, EDI = editorial, MEM = in memoriam, NOT = note, REV = review, SHO = short communication, and WKS = workshop report.

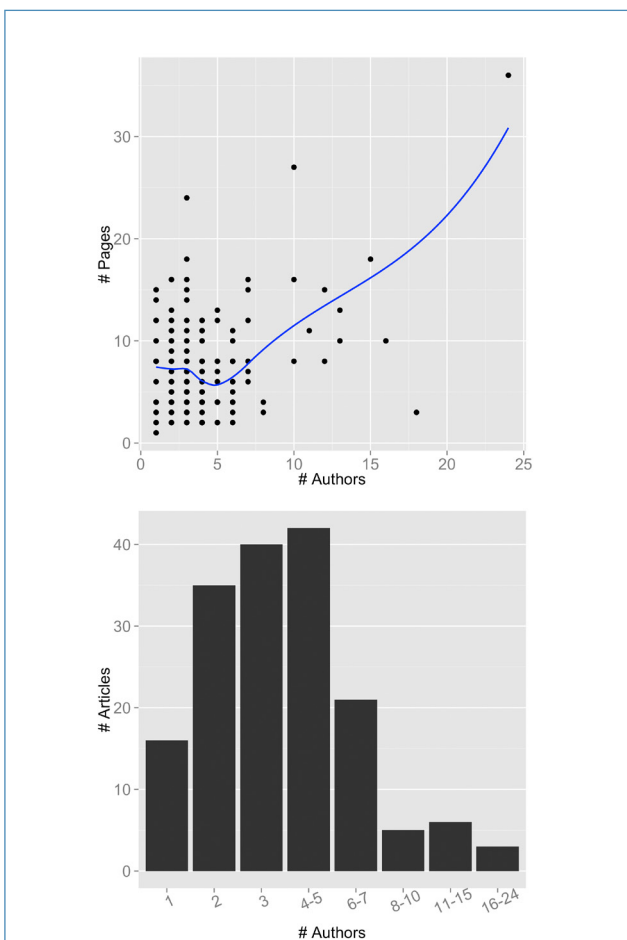


Figure 3. Number of authors versus article length (top) and frequency distribution of the number of authors per article (bottom) for 168 articles published in *LAJAM* during the period 2002-2010. Blue line in top panel is a loess scatterplot smoother (span = 0.75, degree = 2).

The overall average number of authors per article was 4.2 (range = 1-24, mode = 3, median = 3), and there was a general trend for articles with more authors to be of greater length, as would be expected (Fig. 3, top panel). Articles with single authors accounted for 9.5% of the total, while articles authored by 3-5 authors were the most frequent (48.8%). Articles with more than seven authors were rare, and only three articles had more than 16 authors (Fig. 3, bottom panel).

Content Analysis

All taxonomic orders of aquatic mammals occurring in Latin America were represented in the journal's output, in the following order: Cetacea (mostly odontocetes and a few mysticetes), Carnivora (mostly pinnipeds and one mustelid), and Sirenia (see Appendix 1 for a complete listing). At the species level, most of the research was conducted on small odontocetes (*Sotalia*, *Pontoporia*, *Tursiops*) and pinnipeds (*Arctocephalus*, *Otaria*, *Mirounga*) of coastal habits. Rorqual whales (*Balaenoptera*, *Megaptera*) and oceanic odontocetes (*Stenella*, *Mesoplodon*, *Orcinus*, *Delphinus*) also were well represented (Fig. 4).

The research topics covered four main areas: ecology, biology, population assessment approaches, and impacts of human activities (see Appendix 2 for a listing of the terms and areas). Studies of distribution (including new records) largely dominated the production, followed by studies of prey and feeding, and strandings. Studies documenting health issues, bycatch and other human impacts also were well represented. Finally, several studies employed approaches for population assessment.

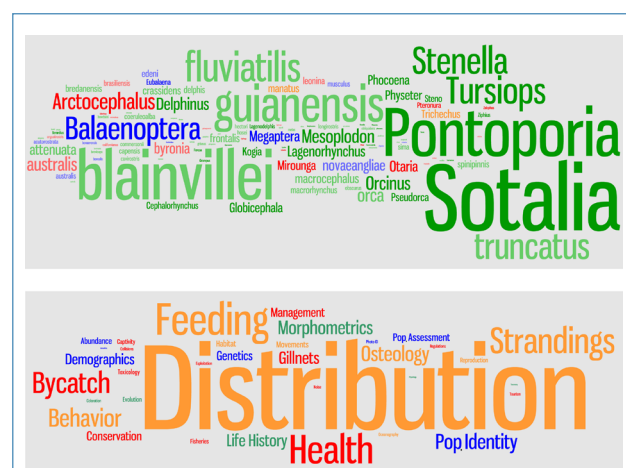


Figure 4. Word cloud representations of the contents of the 168 articles published in *LAJAM* during the period 2002-2010 for: (top) species scientific names, color-coded by taxonomic group (green: odontocetes, blue: mysticetes, red: carnivorans, orange: sirenians), and (bottom) research topics, color-coded by main areas (orange: ecology, green: biology, blue: population assessment approaches, red: impacts of human activities). See the complete lists in Appendices 1 and 2, respectively.

National Contribution and Affiliation Patterns

Table 1 and Figures 5 and 6 present the number of articles by country and by affiliation type. A total of 17 countries were represented based on the primary affiliation of the lead author. Of the 168 articles published in *LAJAM* over the period 2002-2010, over one half were from Brazil (n = 87; 51.7%), followed by Argentina (n = 16; 9.5%), México (n = 11; 6.5%), Uruguay (n = 9; 5.4%) and USA (n = 9; 5.4%). New Zealand appeared three times, while Canada, Italy, Portugal and Spain appeared only once as country of first affiliation (Table 1).

Of the total, 49.4% (n = 83) of the articles were by researchers whose first affiliation was a university, 26.2% (n = 44) were from NGOs, 17.3% (n = 29) were from government agencies, and 7.1% (n = 12) were from other organization types (*i.e.* private associations, consulting firms, or independent scientists). While in some countries there was at least one occurrence of the four affiliation types (Fig. 5), NGOs were the only affiliation type in Ecuador, Costa Rica, and Venezuela, and a university was the only affiliation type in Uruguay and Puerto Rico. Government agencies were absent in Colombia and Chile, but were the dominant

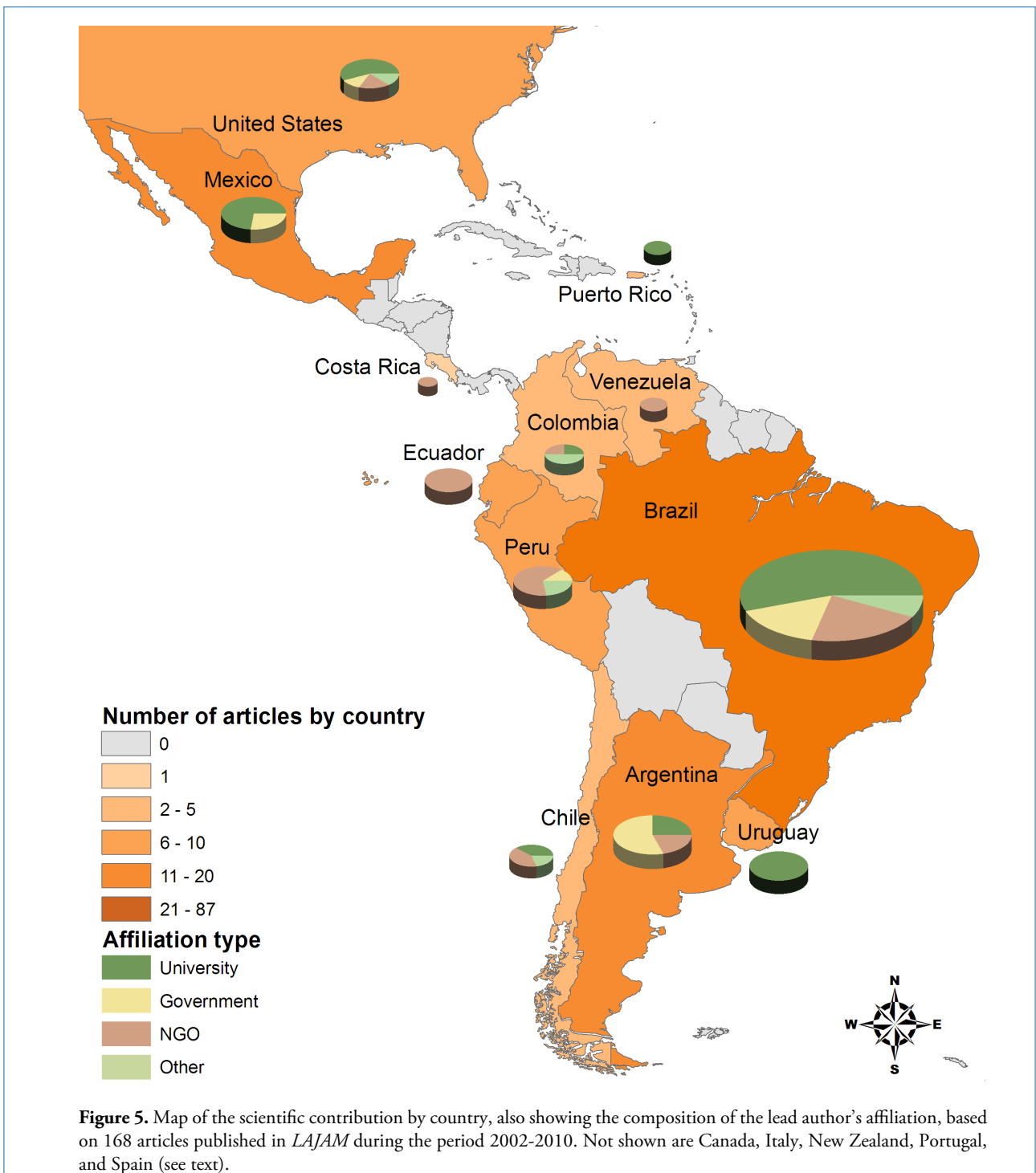


Table 1. List of institutions given as the primary affiliation by the first author for each of the 168 articles published in *LAJAM* for the period 2002-2010. Also included are: country, state, acronym, and institution (inst.) type. Totals are given for number of articles by institution, state, and country.

Country	State	Institution	Acronym	Inst. Type	Total Inst.	Total State	Total Country
Argentina							16
		Fundación AquaMarina	CECIM	NGO	2		
		Fundación Cethus	CETHUS	NGO	1		
		Secretaría de Recursos Naturales y Política Ambiental	SRNPA	Government	1		
		Universidad Nacional de Mar del Plata	UNMP	University	4		
		Centro Nacional Patagónico	CENPAT/ CONICET	Government	4		
		Museo Argentino de Ciencias Naturales 'Bernardino Rivadavia'	MACN/ CONICET	Government	4		
Brazil							87
	Amazonas (AM)					8	
		Instituto Nacional de Pesquisas da Amazônia	INPA	Government	6		
		Museu Paraense 'Emílio Goeldi'	GEMAA	Government	1		
		Universidade Federal do Amazonas	UFAMI	University	1		
	Bahia (BA)					5	
		Instituto Baleia Jubarte	IBJ	NGO	3		
		Instituto de Pesquisa e Conservação dos Mamíferos Aquáticos	CRMA	NGO	1		
		Instituto Mamíferos Aquáticos	IMA	NGO	1		
	Ceará (CE)					8	
		Associação de Pesquisa e Preservação de Ecossistemas Aquáticos	AQUASIS	NGO	5		
		Universidade Estadual do Ceará	UECE	University	1		
		Universidade Federal do Ceará	UFC	University	2		
	Espírito Santo (ES)					3	
		Everest Tecnologia em Serviços, Ltda.	ETS	Other	2		
		Organização Consciência Ambiental	ORCA	NGO	1		
	Minas Gerais (MG)					1	
		Pontifícia Universidade Católica de Minas Gerais	PUCMG	University	1		
	Pernambuco (PE)					3	
		Centro Golfinho Rotador	CGR	NGO	1		
		Other		Other	1		
		Universidade Federal de Pernambuco	UFPE	University	1		
	Paraná (PR)					1	
		Universidade Federal do Paraná	UFPR	University	1		
	Rio de Janeiro (RJ)					12	
		Fundação Oswaldo Cruz	FIOCRUZ	Government	5		
		Other		Other	1		

		Universidade Estadual do Norte Fluminense	UENF	University	2		
		Universidade Estadual do Rio de Janeiro	UERJ	University	3		
		Universidade Federal do Rio de Janeiro	UFRJ	University	1		
	Rio Grande do Sul (RS)					27	
		Fundação Universidade Federal do Rio Grande	FURG	University	11		
		Grupo de Estudos de Mamíferos Aquáticos do Rio Grande do Sul	GEMARS	NGO	6		
		Pontifícia Universidade Católica do Rio Grande do Sul	PUCRS	University	2		
		Universidade Federal de Pelotas	UFPEL	University	2		
		Universidade Federal do Rio Grande do Sul	UFRGS	University	6		
	Santa Catarina (SC)					5	
		Centro Nacional de Pesquisa & Conservação de Mamíferos Aquáticos	ICMBio	Government	2		
		Instituto de Pesquisa & Conservação de Golfinhos	IPCG	NGO	1		
		Universidade Federal de Santa Catarina	UFSC	University	2		
	São Paulo (SP)					14	
		Aquario de Ubatuba	AQUB	Other	1		
		Instituto Terra & Mar	ITM/SOS	NGO	1		
		Projeto BioPesca	BioPesca	NGO	1		
		Universidade de São Paulo	USP	University	6		
		Universidade Estadual Paulista 'Júlio de Mesquita Filho'	UNESP	University	5		
Canada							1
	British Columbia (BC)					1	
		Simon Fraser University	SFU	University	1		
Chile							5
		Centro de Conservación Cetacea	CCC	NGO	1		
		Eutropia - Centro de Investigación de Aves y Mamíferos Marinos de Chile	EUTROPIA	NGO	1		
		Other		Other	1		
		Universidad Andrés Bello	UAB	University	1		
		Universidad de Antofagasta	UA	University	1		
Colombia							4
		Fundación Omacha	OMACHA	NGO	1		
		Other		Other	2		
		Universidad de Bogotá 'Jorge Tadeo Lozano'	UJTL	University	1		
Costa Rica							1
		Fundación Keto	KETO	NGO	1		

Ecuador							6
		Fundación Ecuatoriana para el Estudio de Mamíferos Marinos	FEMM	NGO	3		
		Fundación Natura	NATURA	NGO	1		
		Wildlife Conservation Society/ Ecuador	WCS	NGO	2		
Italy							1
		Other		Other	1		
México							11
	Baja California (BC)					1	
		Universidad Autónoma de Baja California	UABC	University	1		
	Baja California Sur (BCS)					8	
		Centro de Investigación Científica y de Educación Superior de Ensenada	CICESE	University	1		
		Instituto Politécnico Nacional Secretaría de Medio Ambiente y Recursos Naturales	CICIMAR SEMARNAT	University Government	3 1		
		Universidad Autónoma de Baja California Sur	UABCS	University	2		
		Centro de Investigaciones Biológicas del Noroeste	CIBNOR/ CONACYT	Government	1		
	Quintana Roo (QROO)					1	
		El Colegio de la Frontera Sur	ECOSUR	Government	1		
	Veracruz (VER)					1	
		Universidad Veracruzana	UVER	University	1		
New Zealand							3
		University of Auckland	UAUCK	University	2		
		University of Otago	UOTAGO	University	1		
Perú							9
		Centro Peruano de Estudios Cetológicos	CEPEC	NGO	6		
		Instituto del Mar del Perú	IMARPE	Government	1		
		Other		Other	2		
Portugal							1
		Universidade do Algarve	UALG	University	1		
Puerto Rico							2
		Universidad Metropolitana	UMET	University	1		
		University of Puerto Rico	UPR	University	1		
Spain							1
		Universidad de Valencia	UVAL	University	1		
United States of America							9

	California (CA)					1	
		National Oceanic and Atmospheric Administration	NOAA	Government	1		
	Hawaii (HI)					2	
		Pacific Whale Foundation	PWF	NGO	1		
		University of Hawaii	UH	University	1		
	New York (NY)					1	
		Columbia University	COLU	University	1		
	Oregon (OR)					1	
		Oregon State University	OSU	University	1		
	Texas (TX)					2	
		Geo-Marine, Inc.	GEO-MARINE	Other	1		
		Texas A&M University	TAMU	University	1		
	Virginia (VA)					1	
		Pew Oceans Commission	PEW	NGO	1		
	Washington (WA)					1	
		Western Washington University	WWU	University	1		
Uruguay							9
		Universidad de la República	UDELAR	University	9		
Venezuela							2
		Centro de Investigación de Cetáceos	CIC	NGO	1		
		Sociedad Ecológica Venezolana Vida Marina	Sea Vida	NGO	1		
Grand Total							168

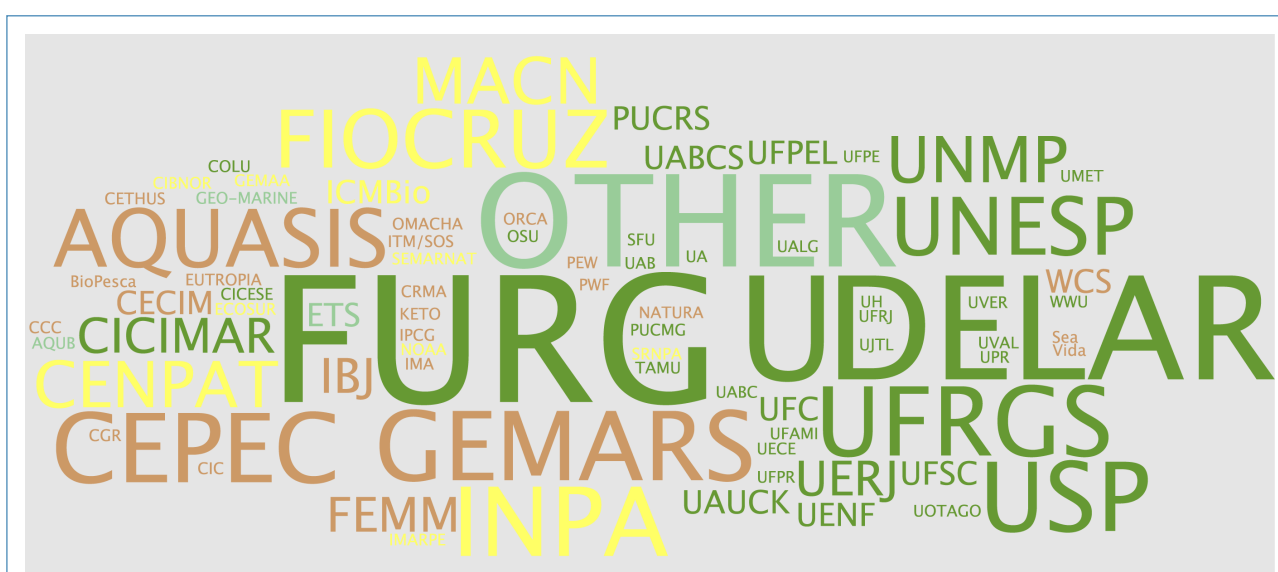
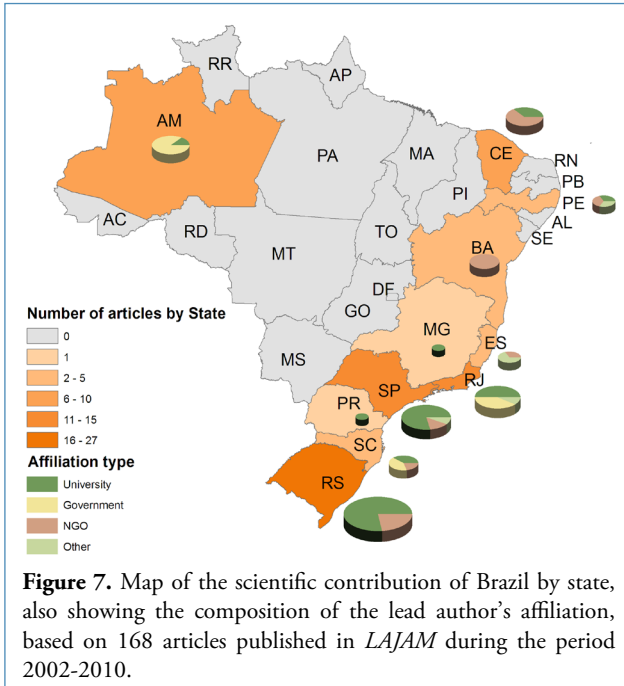
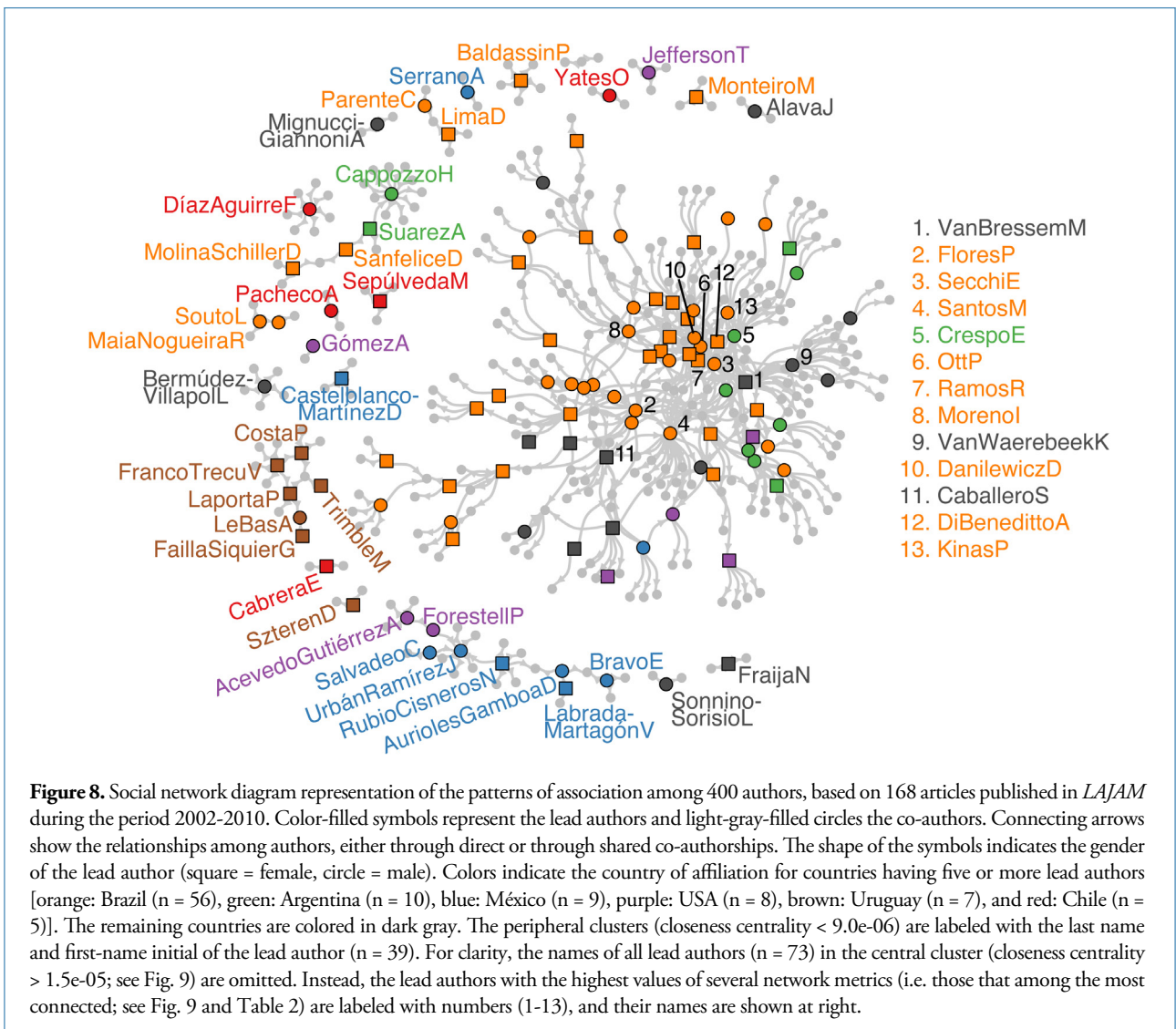


Figure 6. Word cloud representation of the primary affiliation of the lead authors of the 168 articles published in *LAJAM* during the period 2002-2010 (see Table 1 for a list of acronyms). Colors indicate institution type (dark green: university, yellow: government agency, brown: non-governmental organization, light green: other).



affiliation type in Argentina. NGOs were not represented in México and no universities were represented in Perú. Thirty-six universities from 12 different countries were declared as the primary affiliation of the lead author (Table 1, Fig. 6), but just five universities accounted for 44% of the articles: *Fundação Universidade Federal do Rio Grande* (FURG, Brazil; $n = 11$), *Universidad de la República* (UDELAR, Uruguay; $n = 9$), *Universidade de São Paulo* (USP, Brazil; $n = 6$), *Universidade Federal do Rio Grande do Sul* (UFRGS, Brazil; $n = 6$), and *Universidade Estadual Paulista 'Júlio de Mesquita Filho'* (UNESP, Brazil; $n = 5$). Overall, Brazilian universities were responsible for 56.6% of the articles (Table 1, Fig. 6).

The large contribution of articles from Brazil allowed an analysis by state for this country. The research contribution by each state and the composition of the affiliations are shown on the map in Figure 7. Eleven Brazilian states were represented in the affiliation analysis (Table 1). Most of the articles originated from coastal states, with the exception of Minas Gerais and Amazonas. States in the south (Rio Grande do Sul, Santa Catarina, and Paraná) and southeast (São Paulo,



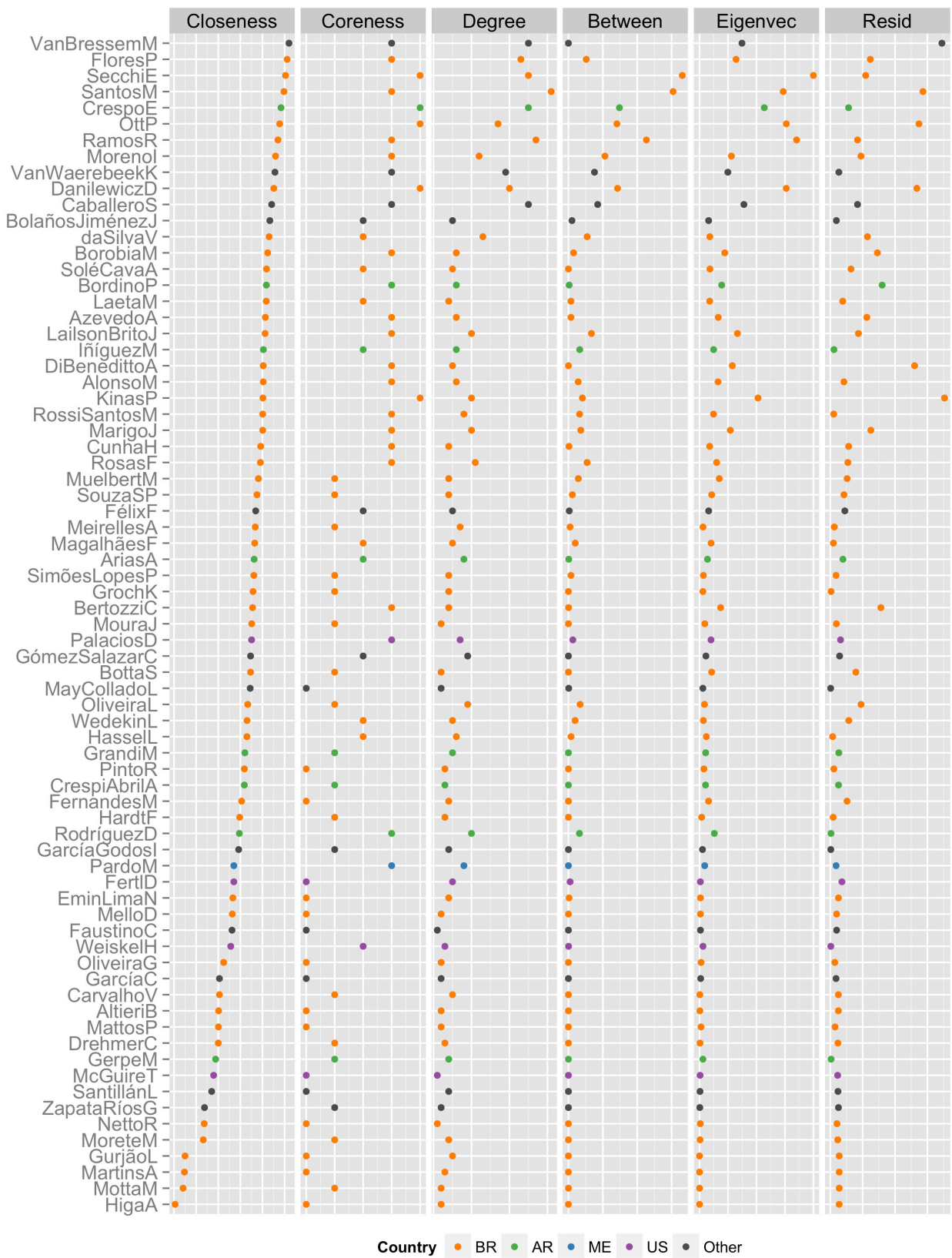


Figure 9. Dotplot representation of six network metrics for the 73 lead authors in the central cluster in Figure 8 (closeness centrality $> 1.5e-05$). Authors are sorted in descending order by closeness centrality. The scale on the x -axis has been omitted for clarity (ranges are: closeness [$1.77e-05$ - $1.80e-05$], coreness [1-5], degree [1-31], betweenness [0-1656], eigenvector [0.0002-1], residual [0.0009-0.3531]). Dots are colored by country of affiliation as in Figure 8. Legend abbreviations are: BR = Brazil, AR = Argentina, ME = México, US = USA (no lead authors from Chile were represented in the central cluster).

Table 2. Social network metrics for 13 authors in the main cluster (see Figs. 8 and 9) with the highest centrality values. For each author, the metrics reported include: closeness, coreness, degree centrality, betweenness centrality, eigenvector centrality, and residual (values > 0.25 are in bold). Also given are gender (F = female, M = male) and country of affiliation.

Author	Gender	Country	Closeness	Coreness	Degree	Betweenness	Eigenvector	Residual
1. VanBressemM	F	Perú	1.8010e-05	4	25	0.0	0.373	0.35
2. FloresP	M	Brazil	1.8006e-05	4	23	259.4	0.321	0.12
3. SecchiE	M	Brazil	1.8002e-05	5	25	1655.7	1.000	0.11
4. SantosM	M	Brazil	1.7999e-05	4	31	1521.2	0.735	0.29
5. CrespoE	M	Argentina	1.7992e-05	5	25	741.4	0.568	0.06
6. OttP	M	Brazil	1.7989e-05	5	17	704.8	0.762	0.27
7. RamosR	F	Brazil	1.7985e-05	4	27	1133.5	0.852	0.08
8. MorenoI	M	Brazil	1.7979e-05	4	12	531.0	0.280	0.09
9. VanWaerebeekK	M	Perú	1.7978e-05	4	19	378.6	0.249	0.03
10. DanilewiczD	M	Brazil	1.7976e-05	5	20	714.1	0.762	0.27
11. CaballeroS	F	Colombia	1.7971e-05	4	25	425.6	0.390	0.08
12. DiBenedittoA	F	Brazil	1.7952e-05	4	5	0.0	0.288	0.26
13. KinasP	M	Brazil	1.7951e-05	5	10	203.1	0.513	0.35

Rio de Janeiro, Minas Gerais and Espírito Santo) parts of the country accounted for more than 70% of the articles. Bahia and Amazonas were the only states where universities were not reported as first affiliation (Table 1, Fig. 7). For Amazonas, government agencies accounted for almost all the contribution. In contrast, in spite of being the state with the highest contribution, government agencies were not represented in Rio Grande do Sul (Table 1, Fig. 7).

Social Network Analysis

The 168 articles were authored by total of 404 unique authors, of which 118 were lead authors and the remainder were co-authors. There were 16 single-authored articles, but of these only four authors did not appear in other multi-authored articles. Thus, there were 400 authors (nodes) and 533 pairwise relations (edges) to build the social network with. The resulting network diagram (Fig. 8) consisted of a large, well-connected cluster of 263 authors (73 lead authors), and a number of small, peripheral clusters containing 137 authors (39 lead authors). The main cluster, primarily dominated by authors from Brazil and Argentina, was distinguished by high closeness centrality values (>1.5e-05), while the peripheral

clusters were characterized by low closeness values (< 9.0e-06). The largest two of the peripheral clusters corresponded to authors from México and Uruguay, respectively, and the remainder represented smaller clusters corresponding to insular groups of authors from Argentina, Brazil, Chile, USA and other countries.

Centrality measures were used to characterize the main cluster. The lead authors with the highest values of closeness centrality also generally (but not always) had the highest values of the other centrality measures (Fig. 9), so we arbitrarily selected the top 11 authors (those with closeness values $\geq 1.7971e-05$) for further investigation. In addition, the residuals from the regression of eigenvector centrality on betweenness centrality identified six authors with high residual values (> 0.25), two of which had not been identified by the centrality measures (Fig. 9). The combined 13 authors with highest network metrics are shown in Figure 8, and their respective values are given in Table 2. These authors were located toward the central parts of the network and were among the most connected, either through direct or through shared co-authorships. The majority was from Brazil, but a few were from Perú, Argentina, and Colombia.

Table 3. List of the most contributive authors based on authorship or co-authorship in three or more articles in *LAJAM* for the period 2002-2012. For each author, the number of articles in order of authorship is given, as well as the gender and country of affiliation.

Author	1st	2nd	3rd	4th	5th+	Total	Gender	Country
Secchi, E.R.	7	3	2	0	5	17	Male	Brazil
Santos, M.C.O.	8	0	0	4	2	14	Male	Brazil
Siciliano, S.	0	4	3	2	5	14	Male	Brazil
Danilewicz, D.	2	2	1	2	1	8	Male	Brazil
Flores, P.A.C.	5	0	1	0	2	8	Male	Brazil
Ramos, R.M.A.	2	0	1	2	3	8	Female	Brazil
Bastida, R.O.	0	2	3	1	1	7	Male	Argentina
Crespo, E.A.	2	0	2	0	3	7	Male	Argentina
Palacios, D.M.	2	2	1	0	2	7	Male	USA
Rosas, F.C.W.	4	2	1	0	0	7	Male	Brazil
Van Waerebeek, K.	2	4	0	0	1	7	Male	Perú
Caballero, S.	2	1	1	2	0	6	Female	Colombia
Cremer, M.J.	0	2	0	1	3	6	Female	Brazil
Di Benedetto, A.P.M.	1	2	0	0	3	6	Female	Brazil
Lailson-Brito, Jr. J.	1	0	2	0	3	6	Male	Brazil
Marigo, J.	1	2	0	1	2	6	Female	Brazil
Moreno, I.B.	2	0	1	0	3	6	Male	Brazil
Oliveira, L.R.	2	2	0	1	1	6	Female	Brazil
Ott, P.H.	1	1	1	1	2	6	Male	Brazil
Rossi-Santos, M.R.	2	0	0	1	3	6	Male	Brazil
Trujillo, F.	0	2	2	1	1	6	Male	Colombia
Bazzalo, M.	0	3	0	1	1	5	Female	Brazil
Bordino, P.	2	1	0	0	2	5	Male	Argentina
Félix, F.	3	0	1	1	0	5	Male	Ecuador
Kinas, P.G.	2	1	0	1	1	5	Male	Brazil
Meirelles, A.C.O.	2	1	1	0	1	5	Female	Brazil
Rodríguez, D.	3	1	0	0	1	5	Male	Argentina
Azevedo, A.F.	1	1	0	0	2	4	Male	Brazil
Bertozzi, C.P.	1	0	1	0	2	4	Female	Brazil
Bolaños-Jiménez, J.	1	0	0	0	3	4	Male	Venezuela
Molina-Schiller, D.	4	0	0	0	0	4	Female	Brazil
Muelbert, M.M.C.	1	1	1	0	1	4	Female	Brazil
Simões-Lopes, P.C.A.	1	0	1	1	1	4	Male	Brazil
Urbán-Ramírez, J.	1	1	0	2	0	4	Male	México
Utreras B., V.	1	1	0	0	2	4	Male	Ecuador
Wedekin, L.L.	1	2	0	0	1	4	Male	Brazil
Zerbini, A.N.	0	1	1	0	2	4	Male	USA
Alvarenga, F.S.	0	0	0	1	2	3	Male	Brazil
Barrios-Garrido, H.	0	0	0	1	2	3	Male	Venezuela
Beltrán-Pedreiros, S.	0	0	1	0	2	3	Female	Brazil
Borobia, M.	1	0	1	0	1	3	Female	Brazil
Cappozzo, H.L.	2	0	0	1	0	3	Male	Argentina
Cunha, H.A.	1	0	0	1	1	3	Female	Brazil
da Silva, V.M.F.	1	2	0	0	0	3	Female	Brazil
Dalla Rosa, L.	0	1	1	1	0	3	Male	Brazil
Flach, L.	0	0	0	1	2	3	Male	Brazil
Fragoso, A.B.L.	0	1	0	0	2	3	Female	Brazil
Furtado-Neto, M.A.A.	0	2	1	0	0	3	Male	Brazil
Iñiguez, M.A.	1	0	1	0	1	3	Male	Argentina
Laeta, M.	1	0	1	0	1	3	Female	Brazil
Le Bas, A.E.	1	1	0	1	0	3	Male	Uruguay
Magalhães, F.A.	1	0	1	0	1	3	Male	Brazil
Montiel-Villalobos, M.G.	0	0	0	0	3	3	Female	Venezuela
Pardo, M.A.	3	0	0	0	0	3	Male	Mexico
Pinedo, M.C.	0	3	0	0	0	3	Female	Brazil
Praderi, R.	0	3	0	0	0	3	Male	Uruguay
Sanino, G.P.	0	0	0	1	2	3	Male	Chile
Vicente, A.F.C.	0	1	0	0	2	3	Male	Brazil
Zampirolli, E.	0	0	1	0	2	3	Male	Brazil

Author Contribution and Gender Patterns

The number of occurrences by author in the database ranged between 1 and 17. Those authors with three or more occurrences, regardless of order of authorship, are listed in Table 3. This list contained 59 of the 404 authors in the database, and was dominated by Brazil (n = 38; 64.4%), followed by Argentina (n = 6; 10.1%), Venezuela (n = 3; 5.1%), Colombia (n = 2; 3.4%), Ecuador (n = 2; 3.4%), México (n = 2; 3.4%), Uruguay (n = 2; 3.4%), USA (n = 2; 3.4%), Chile (n = 1; 1.7%), and Perú (n = 1; 1.7%).

Analysis by gender of the lead author for the 168 articles indicated that the ratio of females (n = 64; 38.1%) to males (n = 104; 61.9%) was 1:1.6. However, among the list of most contributive authors (Table 3) this ratio was 1:2.1 (19 females, 40 males), and of these, only five females were the lead of more than one article, compared to 16 males (1:3.2). There were four females and nine males (1:2.3) among the lead authors with the highest centrality measures in the main cluster of the social network diagram (Table 2). Finally, females were lead authors of five (33.3%) of the 15 most cited articles in *Google Scholar*[™] (see Table 4 and 'Citation Analysis' section below).

Citation Analysis

Based on 91 articles with citation data in *Google Scholar*[™] as of 7 January 2012, the average number of times a *LAJAM* article has been cited was 7.5 (range = 1-51, mode = 1, median = 4). However, we note that these statistics would be much lower if the 77 articles with no citations were included in the calculations. The list of the top 15 articles with most citations is given in Table 4. These articles were cited between 13 and 51 times, and the vast majority came from Brazil. The majority of these articles were long-term studies of species commonly found in coastal waters (e.g. *Sotalia guianensis*, *Pontoporia blainvillei*, *Trichechus manatus*), and addressed aspects such as distribution, habitat use, ecology, diet, morphology, toxicology, strandings, and interactions with fisheries. One article reported on recent trends for a population of a species of large whale (*Eubalaena australis*), and two were comprehensive reviews of issues of growing concern such as cetacean diseases and vessel collisions with cetaceans.

Discussion

This study represents a snapshot of the scientific endeavors undertaken by Latin American aquatic mammal researchers in the 2000s, as reflected by the content published in *LAJAM* (for an example of a similar analysis with the journal *Conservation Biology* see Harrison, 2006). In many cases, members of *SOLAMAC* and *SOMEMMA* conducted the research, and it is our hope that the results of this meta-analysis will provide these scientific communities with insights regarding the level of engagement of their members, as well as their impact within the Latin American and global contexts. We also hope that this exercise will be useful to the individual researchers,

their institutions, and the national programs as a tool to assess their efforts and resource allocation.

Before discussing the results, however, we consider several limitations of the data and of the analyses that should be borne in mind when interpreting the study. Importantly:

- The analyses were based on a relatively small sample size (n = 168 articles). Further, the results are only representative of the subset of researchers that chose to publish in *LAJAM* during the period covered by the study. Latin American scientists certainly publish their work in many other outlets, and there may well be prominent researchers that have never published in *LAJAM*. The same may have been the case for species or research topics that had a low representation in this study.
- Because *LAJAM* was begun as a grassroots effort and because it is operated by organizations with very low operating budgets, it does not have the well-developed infrastructure of more established scientific journals. Specifically, *LAJAM* does not yet have wide indexation coverage or an impact factor, and this affects the material and authors that it attracts because of the growing pressure on researchers to publish in top-tier journals.
- The analysis of national contributions reporting the number of articles contributed by country as a percentage of the total does not factor in country population size or other relevant measure. Adequate weighting would require additional knowledge about the composition of the scientific community relative to the total population within these countries which beyond the scope of this study.
- The analysis of affiliation patterns was done using only the first affiliation reported by the lead author. However, it was often the case that authors provided more than one affiliation (a university and an NGO were a common combination), and this could confound the results of the contributions by the different institution types, or give an imperfect picture of how resources are allocated in the different countries (or states in the case of Brazil).
- Similarly, in the social network and author contribution analyses, for lead authors with multiple articles we used the most recent country of affiliation reported. In a few cases this may have resulted in some bias in the totals by country, especially for countries with few occurrences.
- Finally, in the citation analysis we did not separate citations of an article by the same author ('self-citation') from those by other authors because we felt that such a level of analysis was beyond the scope of our study. While the statistics reported in this section are probably influenced by self-citation to some extent, by focusing on the top 15 articles with the most citations this effect is likely reduced.

Content Analysis

Two of *LAJAM*'s issues have been specials devoted to particular species: *Pontoporia* (Vol. 1, No. 1, 2002) and *Sotalia* (Vol. 8, Nos. 1-2, 2010), respectively. This undoubtedly biased the content analysis toward these three species (*P. blainvillei*, *S. guianensis*, *S. fluviatilis*). But that aside, the fact that the majority of the research was conducted on species that have coastal habits (or that come ashore, in the case of pinnipeds) is not surprising, considering that this is where they are most accessible to the researcher. These species also tend to be the ones more affected by human activities, and therefore it is also not surprising that health, interactions with fisheries, and management were recurring topics in many of the studies. However, it is interesting that other species that are similarly accessible like some large whales (*Eschrichtius*, *Eubalaena*, *Megaptera*), or that occur in riverine habitats (*Inia*, *Pteronura*, *Trichechus*) had a disproportionately low representation in the sample. Since most of these species are the subject of active research programs (e.g. Urbán *et al.*, 2003; Hucke-Gaete *et al.*, 2004; Martin and da Silva, 2004; Leaper *et al.*, 2006; Acevedo *et al.*, 2007; Andriolo *et al.*, 2010; Arraut *et al.*, 2010), we surmise that researchers studying these species have tended to favor other publication outlets.

Studies related to distribution, prey and feeding, strandings, and morphology were the most common research topics, whereas studies involving population assessment, demographics, and abundance estimation were much fewer. Studies in the fields of genetics and acoustics were the least common. To some extent this situation reflects the areas and levels of expertise of researchers in Latin America, and also the resources available to them. But it is also important to point out that Latin American scientists submit their best research to higher-tier journals (e.g. Vianna *et al.*, 2006; Campagna *et al.*, 2007; Olavarría *et al.*, 2007; Sousa-Lima *et al.*, 2008; Salvadeo *et al.*, 2010; Garaffo *et al.*, 2011; Franco-Trecu *et al.*, 2012; Lailson-Brito *et al.*, 2012; Oliveira *et al.*, 2012; Riet-Sapriza *et al.*, 2013), because of the expectations by the national funding agencies.

National Contribution and Affiliation Patterns

The predominance of Brazil, Argentina, México and Uruguay in terms of contribution has a historical basis. Research on aquatic mammals in Latin America began to surge in the 'Southern Cone' region of South America (Argentina, Chile, Uruguay, and southern/southeastern Brazil) and in México during the 1970s and 1980s (Rosas *et al.*, 1994³;

Oliva, 2012⁴). These countries traditionally have had the most experts and resources, and therefore it is not surprising that several of them were well represented in the national contribution. Further, *LAJAM* originated in Brazil and it drew strong Brazilian participation from the outset. Interestingly, however, Chile was poorly represented in the national contribution, perhaps because of a strong researcher reliance on this country's government funding agency (*Comisión Nacional de Investigación Científica y Tecnológica, CONICYT*), which requires publication in indexed journals. Similarly, considering its long-standing tradition and expertise in marine mammal research, it was somewhat surprising that México had a relatively low representation. In this case, in addition to similar expectations from funding agencies, this also may have been due to regional separation (given the geographic distance to the other centers of production; see Figs. 5 and 8), and to the fact that *SOMEMMA* became involved with *LAJAM* only recently. Finally, the almost complete lack of representation from countries in Central America and the Caribbean in the sample should point *SOLAMAC* and *SOMEMMA* to a need to deploy outreach efforts aimed at promoting and integrating researchers from these countries within the societies.

In terms of patterns of affiliation, the fact that no universities or government agencies were represented in Ecuador, Costa Rica and Venezuela is suggestive of the level of support that aquatic mammal science has received in these countries. It is very common for researchers in Latin American nations to create their own NGOs as a way to remain active in the field, and it is possible that this is the most (or only) viable alternative for scientists from these and neighboring countries like Colombia and Panamá. A more in-depth analysis and discussion of these patterns is beyond the scope of this study, but we note that research activities and output can be strongly influenced by the policies and mission of the funding sources. Ultimately, the level of support of scientific and technological activities is a reflection of the national socio-economic and political climate, which is highly variable throughout Latin America (e.g. Dabène, 2009; Cárdenas *et al.*, 2010⁵). But given the at-risk conservation status of several aquatic mammal species in the region, vigorous support from the government and academic sectors are crucial to the successful management of human activities that harm these natural resources (e.g. Vidal, 1993; Truda Palazzo 1994; Vidal, 1994; Costa *et al.*, 2005).

³Rosas, F.C.W., Marmontel, M. and Castello, H.P. (1994) Reuniões de Trabalho de Especialistas em Mamíferos Aquáticos da América do Sul: histórico e evolução dos 10 primeiros anos. Pages 1-4 in Abstracts, 6a Reunión de Trabajo de Especialistas en Mamíferos Acuáticos de América del Sur, 24-28 October 1994, Florianópolis, Brazil.

⁴Oliva, D. (2012) Desarrollo de la investigación sobre mamíferos acuáticos en América del Sur: avances y perspectivas. In Abstracts, 15ª Reunión de Trabajo de Expertos en Mamíferos Acuáticos de América del Sur y 9º Congreso SOLAMAC, 16-20 September 2012, Puerto Madryn, Argentina.

⁵Cárdenas, M., Levy-Yeyati, E. and Henao, C. (2010) Brookings Latin America Economic Perspectives. Latin America Initiative at Brookings, The Brookings Institution, 1775 Massachusetts Avenue NW, Washington, DC 20036, USA. [Available from: <http://www.brookings.edu/research/reports/2010/09/1006-latin-america-economy-cardenas>].

Table 4. List of the top 15 articles in *LAJAM* for the period 2002-2012, according to the number of times they have been cited in *Google Scholar*TM as of 7 January 2012. Only the name of the lead author is given; the complete citations are given in the References. Also provided are the article type, as well as the gender and country of affiliation of the first author. Article types are: ART = article, REV = review, WKS = workshop report.

Lead Author	Title	Year	Type	# Cites	Gender	Country
Flores, P. A. C.	Home ranges and movement patterns of the marine tucuxi dolphin, <i>Sotalia fluviatilis</i> , in Baía Norte, southern Brazil	2004	ART	51	Male	Brazil
Rodríguez, D.	Feeding ecology of the franciscana (<i>Pontoporia blainvillei</i>) in marine and estuarine waters of Argentina	2002	ART	29	Male	Argentina
Van Bresseem, M-F.	A preliminary overview of skin and skeletal diseases and traumata in small cetaceans from South American waters	2007	REV	26	Female	Perú
Van Waerebeek, K.	Vessel collisions with small cetaceans worldwide and with large whales in the Southern Hemisphere, an initial assessment	2007	REV	23	Male	Perú
Groch, K. R.	Recent rapid increases in right whale (<i>Eubalaena australis</i>) population off southern Brazil	2005	ART	22	Female	Brazil
Rosas, F. C. W.	Incidental catches of franciscana (<i>Pontoporia blainvillei</i>) on the southern coast of São Paulo state and the coast of Paraná state, Brazil	2002	ART	20	Male	Brazil
Di Benedetto, A. P. M.	Interactions between gillnet fisheries and small cetaceans in northern Rio de Janeiro, Brazil: 2001-2002	2003	ART	19	Female	Brazil
Gerpe, M. S.	Accumulation of heavy metals in the franciscana (<i>Pontoporia blainvillei</i>) from Buenos Aires province, Argentina	2002	ART	18	Female	Argentina
Santos, M. C. O.	Ecological aspects of marine tucuxi dolphins (<i>Sotalia guianensis</i>) based on group size and composition in the Cananéia estuary, southeastern Brazil	2007	ART	18	Male	Brazil
Ramos, R. M. A.	Morphology of the franciscana (<i>Pontoporia blainvillei</i>) off southeastern Brazil: sexual dimorphism, growth and geographic variation	2002	ART	16	Female	Brazil
Secchi, E. R.	Report of the fourth workshop for the coordinated research and conservation of the franciscana dolphin (<i>Pontoporia blainvillei</i>) in the Western South Atlantic	2002	WKS	15	Male	Brazil
Parente, C. L.	Strandings of Antillean manatees, <i>Trichechus manatus manatus</i> , in northeastern Brazil	2004	ART	15	Male	Brazil
Flores, P. A. C.	Ecology of marine tucuxi, <i>Sotalia guianensis</i> , and bottlenose dolphin, <i>Tursiops truncatus</i> , in Baía Norte, Santa Catarina state, southern Brazil	2006	ART	15	Male	Brazil
Santos, M. C. O.	Records of franciscana (<i>Pontoporia blainvillei</i>) from the coastal waters of São Paulo state, southeastern Brazil	2002	ART	13	Male	Brazil
Rossi-Santos, M. R.	Distribution and habitat use of small cetaceans off Abrolhos Bank, eastern Brazil	2006	ART	13	Male	Brazil

Within Brazil, the dominance of the southern and southeastern states in the national contribution is likely a reflection of the prosperous economic situation of these regions, and more specifically of the fact that the academic study of marine sciences originated there in the 1970s. This contrasts with the situation in the northern and northeastern states, with the notable exception of Amazonas (Fig. 7), where significant government involvement likely reflects active management efforts for the conservation of populations of several riverine species (*Inia*, *Pteronura*, *Sotalia*, *Trichechus*). One general consideration within the Brazilian context (but also relevant to other countries) is that, even in states where government agencies had a low representation, many fellowships and grant awards to universities come from government sources like the *Conselho Nacional de Desenvolvimento Científico e Tecnológico* (CNPq), or the *Fundação de Amparo à Pesquisa do Estado de São Paulo* (FAPESP).

Author Contribution, Gender Bias and Scientific Impact

The patterns of author contribution and connectivity generally paralleled those of national contribution, with some particularities. While authors from Brazil and Argentina still had a predominant role, there was more representation of authors from other countries (Table 3). Also, a few authors from Perú and Colombia had a disproportionately high importance in the community in terms of their level of collaboration (Figs. 8 and 9), and of the impact of the science they produced (Table 4).

In terms of gender composition, while the overall ratio of females to males among lead authors (1:1.6) did not appear inordinately skewed, this ratio was more strongly skewed among the most contributive authors (1:3.2). Because our assessment of author contribution was intended to gauge tenure in the field, one possible interpretation is that a lower recurrence might possibly indicate that women were less likely than men to continue their careers (or at least that they were less likely to choose *LAJAM* as a regular outlet for their work). We emphasize, however, that the patterns identified in this section need to be interpreted with great caution because of the limitations highlighted at the beginning of the Discussion.

These caveats notwithstanding, women have made important contributions to aquatic mammal science in Latin America, as demonstrated by the fact that a female was the lead author in five of *LAJAM*'s 15 most cited articles (Table 4). Gender bias arising from cultural attitudes toward women in the sciences is a pervasive issue in many disciplines and parts of the world (e.g. Laird *et al.*, 2007; Goulden *et al.*, 2009⁶; Hill

et al. 2010⁷; Holmes *et al.*, 2011; West *et al.*, 2013). Being a tapestry of many nations and cultures, these attitudes can vary among Latin American countries, and therefore we encourage our societies to further this discussion to obtain a better understanding of the situation. Specifically, *SOLAMAC* and *SOMEMMA* could to adopt proactive policies to (a) encourage female scientists to publish more, (b) provide more leadership roles to women, and (c) monitor the tenure patterns of their members to ensure women stay in aquatic mammal careers.

The greatest scientific impact of the science published in *LAJAM*, as indicated by the most cited articles (Table 4), has been by studies presenting synthetic reviews or significant advances in a specific topic arising from extensive research efforts. Additionally, the two special issues devoted to *Pontoporia* and *Sotalia*, while requiring major efforts to put together, have mobilized and integrated the researcher community, resulting in the generation of cutting-edge knowledge. Collectively, these special issues represent the most comprehensive publications available on these three species.

Conclusion

This meta-analysis has allowed to us paint a portrait of the production and authorship patterns of the first eight years of *LAJAM*. These patterns are likely to evolve as the science progresses and as the two societies, *SOLAMAC* and *SOMEMMA*, continue to grow. Also, as more emphasis is placed on publishing in the peer-reviewed literature in Latin America, we can hope that the quantity and quality of the articles appearing in the journal will improve. As we enter the electronic era, *LAJAM* is also evolving by adopting an online-only publication model that uses modern technological tools to make it more broadly accessible (see: <http://lajamjournal.org/>). Additionally, the journal continually strives to improve itself by recruiting well-recognized scientists from the region as Editors, and by drawing from a global reviewer pool.

We celebrate the accomplishments of our colleagues, who have devoted significant efforts to advancing the science while also supporting the journal. Given the number of aquatic mammal species facing vexing conservation issues in the region (Reeves *et al.*, 2002; Schipper *et al.*, 2008; Kovacs *et al.*, 2012), it is our hope that the results of this study will not only help identify research gaps, but that they also will galvanize the scientific community. We call for Latin American scientists to redouble their efforts to generate the best possible knowledge regarding population status and the impact of human activities on the most threatened species. Many of these issues are common to several countries, and to be most efficient, these goals will require the establishment of regional networks of experts working beyond national boundaries.

⁶Goulden, M., Frasn, K. and Mason, M.A. (2009) Staying Competitive: Patching America's Leaky Pipeline in the Sciences. Center for American Progress and Berkeley Center on Health, Economic and Family Security, UC Berkeley School of Law, University of California. Washington, DC, USA. 48 pp. [Available from: <http://www.americanprogress.org/issues/>

⁷Hill C., Corbett C. and St. Rose, A. (2010) Why so few? Women in science, technology, engineering and mathematics. American Association of University Women (AAUW). [Available from: <http://www.aauw.org/learn/research/whysofew.cfm>].

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Appendix 1. List of aquatic mammal species included in the 168 articles published in *LAJAM* for the period 2002-2010.

Order	Family	Species
Cetacea*	Balaenidae	<i>Eubalaena australis</i>
	Eschrichtiidae	<i>Eschrichtius robustus</i>
	Balaenopteridae	<i>Balaenoptera acutorostrata</i> <i>Balaenoptera bonaerensis</i> <i>Balaenoptera borealis</i> <i>Balaenoptera edeni</i> <i>Balaenoptera musculus</i> <i>Balaenoptera physalus</i> <i>Megaptera novaeangliae</i>
	Physeteridae	<i>Physeter macrocephalus</i>
	Kogiidae	<i>Kogia breviceps</i> <i>Kogia sima</i>
	Platanistidae	<i>Platanista gangetica</i>
	Pontoporiidae	<i>Pontoporia blainvillei</i>
	Lipotidae	<i>Lipotes vexillifer</i>
	Phocoenidae	<i>Neophocaena phocaenoides</i> <i>Phocoena phocoena</i> <i>Phocoena sinus</i> <i>Phocoena spinipinnis</i>
	Delphinidae	<i>Cephalorhynchus commersonii</i> <i>Cephalorhynchus eutropia</i> <i>Cephalorhynchus hectori</i> <i>Delphinus capensis</i> <i>Delphinus delphis</i> <i>Feresa attenuata</i> <i>Globicephala macrorhynchus</i> <i>Globicephala melas</i> <i>Grampus griseus</i> <i>Lagenodelphis hosei</i> <i>Lagenorhynchus albirostris</i> <i>Lagenorhynchus australis</i> <i>Lagenorhynchus obliquidens</i> <i>Lagenorhynchus obscurus</i> <i>Orcaella brevirostris</i> <i>Orcinus orca</i> <i>Peponocephala electra</i> <i>Pseudorca crassidens</i> <i>Sotalia fluviatilis</i> <i>Sotalia guianensis</i> <i>Sousa chinensis</i> <i>Stenella attenuata</i> <i>Stenella clymene</i> <i>Stenella coeruleoalba</i> <i>Stenella frontalis</i> <i>Stenella longirostris</i> <i>Steno bredanensis</i> <i>Tursiops truncatus</i>

	Ziphiidae	<i>Berardius arnuxii</i> <i>Berardius bairdii</i> <i>Hyperoodon planifrons</i> <i>Mesoplodon bowdoini</i> <i>Mesoplodon europaeus</i> <i>Mesoplodon ginkgodens</i> <i>Mesoplodon grayi</i> <i>Mesoplodon hectori</i> <i>Mesoplodon layardii</i> <i>Mesoplodon mirus</i> <i>Mesoplodon peruvianus</i> <i>Tasmacetus shepherdi</i> <i>Ziphius cavirostris</i>
Carnivora	Otariidae	<i>Arctocephalus australis</i> <i>Arctocephalus galapagoensis</i> <i>Arctocephalus tropicalis</i> <i>Callorhinus ursinus</i> <i>Otaria byronia</i> <i>Zalophus californianus</i>
	Phocidae	<i>Hydrurga leptonyx</i> <i>Lobodon carcinophaga</i> <i>Mirounga angustirostris</i> <i>Mirounga leonina</i> <i>Phoca vitulina</i>
	Mustelidae	<i>Pteronura brasiliensis</i>
Sirenia	Trichechidae	<i>Trichechus manatus</i>

*Note that while we follow the traditional nomenclature, marine mammal taxonomy is currently undergoing important revisions. For the most updated taxonomical status, see: Committee on Taxonomy (2012) *List of marine mammal species and subspecies*. Society for Marine Mammalogy, <http://www.marinemammalscience.org>, consulted on 20 December 2013.

Appendix 2. List of descriptive terms for research topics by area, extracted from the 168 articles published in *LAJAM* for the period 2002-2010.

Area	Term
Ecology	Behavior Distribution Feeding Habitat Movements Oceanography Strandings
Biology	Coloration Evolution Life History Morphometrics Osteology Physiology Reproduction Taxonomy
Population assessment approaches	Abundance Acoustics Demographics Genetics Photo-Identification Population Assessment Population Identity
Impacts of human activities	Bycatch Captivity Collisions Conservation Toxicology Exploitation Fisheries Gillnets Health Management Noise Regulations Tourism