Comparing Metropolitan Governance in Germany and the US: A Social Network Analysis

Alexander Masser, Alan E. Alvarez, David C. Prosperi, Diana Mitsova

(Alexander Masser, TU Kaiserslautern, alexander.masser@googlemail.com)
(Alan E. Alvarez, Florida Atlantic University, alan.alvarez25@gmail.com)
(Professor Dr. David C. Prosperi, Florida Atlantic University, prosperi@fau.edu)
(Assistant Professor Diana Mitsova, Florida Atlantic University, dmitsova@fau.edu)

1 ABSTRACT

The context for this paper is a comparison of metropolitan governance of specific metropolitan regions in Germany and the United States. In Germany, the Academy for Spatial Research and Planning (ARL) describes metropolitan regions or spaces as high-density locations, which are centers of the global network of goods, capital, information and migration flows. In the United States, metropolitan regions or metropolitan statistical areas are based on the concept of a core area with a large population nucleus, plus adjacent communities that have a high degree of economic and social integration with that core. On the surface, the German definition appears to focus more squarely on building social capital and creating metropolitan governance structures capable of achieving "centeredness".

In this paper, we compare aspects of metropolitan governance for the metropolitan areas of Hamburg, Germany and South Florida, USA. To simplify the empirical analysis, we focus on a single governance function – planning for adaptation to climate change. UCINET network analysis software is used to examine the pattern of interaction among stakeholders. The software returns indicators of size, connectivity, and cluster. Each of these indicators tells us about different attributes of the governance structure. The formal null hypothesis is that all three types of measures (representations of metropolitan governance) will be identical for both metropolitan regions. The formal null hypothesis is mostly rejected. The two regions demonstrate markedly different planning networks in dealing with adaptation to climate change. The final part of the paper reflects on the general method of using social network analysis to characterize metropolitan governance structures.

2 THE QUESTION OF GOVERNANCE IN METROPOLITAN REGIONS

The first question is "what is metropolitan governance?". Most would define "governance" in relation to the "government". Government is a formal administrative structure; governance is more than that – it includes the voluntary sector, NGOs, private organizations, and intergovernmental (and multi-scalar) linkages. Williams (1971) distinguished between "systems maintenance" issues and "lifestyle" issues; the former are best accomplished at the metropolitan scale. Yet, metropolitan governance continues to elude both the public eye and the academic lens (Feiock, 2004).

The metropolitan governance literature articulates two competing or different schemes that, for the sake of simplicity, can be termed "centralized" and "decentralized". Centralized governance schemes rely on a central government. Decentralized governance schemes are witnessed by a lack of a central government. The assumption in this paper is that German cities are more likely to have central governmental structures, while the US metropolitan areas are typically devoid of such mononucleated institutions. It is an empirical question as to which system of governing is better; it is likely that there is no clear answer. For example, Salet, Kreukels and Thornley (2003) argue that there is no one best method; governance systems are idiosyncratic and contextual. The proponents for any governance system – be they public choice theorists (Ostrom, 2005, Bickers and Stein, 2002), metropolitan reformers (Oakerson, 2002), or new regionalists (Savitch and Vogel, 2000, Wheeler, 2002) are simply making pronouncements. Empirical verification is sorely missed.

To simplify matters, we have chosen to focus on the governance of a single issue: planning for adaptation to issues raised by climate change (this is, we believe a systems maintenance issue and thus appropriately organized and governed at the metropolitan scale). Our approach is to compare how planning is accomplished in two metropolitan areas similar in most regards with the exception of how planning functions are organized. In Hamburg, Germany, such planning is accomplished at the regionwide scale by a central authority; in South Florida, the planning is organized as a decentralized network of stakeholders.

This paper is organized as follows. The next section provides both the development of the comparison methodology and context including some descriptive statements about the Hamburg and South Florida metropolitan regions. This is followed by a exposition of the social network analysis approach, including a discussion of its methodology and measures. The fifth part reports results in terms of data collection, data preparation, and computation. This is followed by a discussion of the results in terms of preliminary expectations and a reflection of the method and general conclusions about how social network analysis enhances understanding of metropolitan governance.

3 DESIGN OF THE COMPARATIVE CASE STUDY

3.1 The Design of the Comparative Case Study

There are a number of similarities and differences between the two metropolitan areas. Similarities include: rough equivalencies in terms of location (on major water bodies), function (ports trying to become knowledge centers), administrative and political complexity (multiple jurisdictions), and size (roughly equivalent). Differences include:distinct variations in both how governance is organized and in functional approach. The Hamburg region has a metropolitan wide planning agency, wherein the planning for adapation to climate change is accomplished in a “top down” fashion; while the South Florida region does not and thus such planning could be characterized as “bottoms up”. Moreover, planning in Germany continues to function along technological lines; while the South Florida region seems to function along process lines. The essence of the comparative study is to calibrate and discuss differences in social network attributes between the planning systems.

The two systems are the KLIMZUG-NORD project in Hamburg and the SOUTHEAST FLORIDA REGIONAL CLIMATE CHANGE COMPACT in South Florida. Both are described more fully below.

3.2 Hamburg Metropolitan Region

The Conference of Ministers for Spatial Planning designated the Hamburg Metropolitan Region as a European Metropolitan Region in 1995. It is defined as a dense populated area with a surrounding region, which has global integration, as a result of its economic, political and traffic and international importance (Heimpold, 2006). The spatial boundary of the Hamburg Metropolitan Region is defined in the treaty from 2005 between the Freie und Hansestadt Hamburg, Niedersachsen, and Schleswig-Holstein (Grotheer 2011). It consists of fourteen administrative districts (6 within the Federal State of Schleswig-Holstein and 8 within the Federal State of Niedersachsen) and the entirety of the Federal State of Hamburg

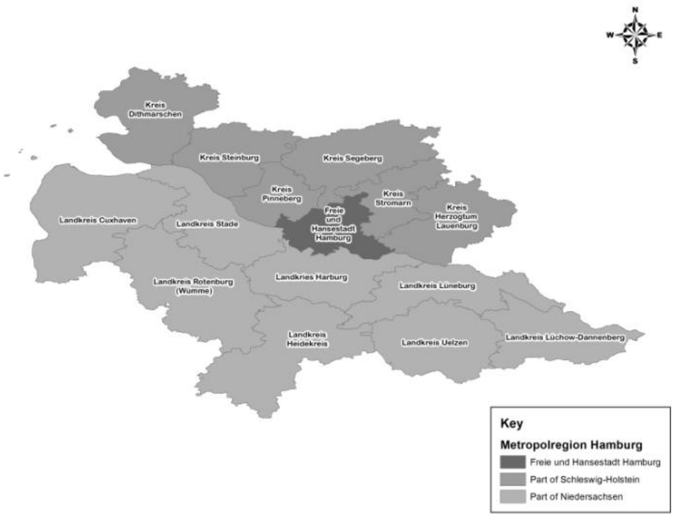

Fig. 1: The Hamburg Metropolitan Region

Overall, the Hamburg Metropolitan Region has a total population of 4,301,920, with a population density of 207 persons per km² (Statistikportal der Metropolregion Hamburg, 2012). The region extends over a large area in the North of Germany and includes very different structured sub-spaces: from the prosperous subspaces of Hamburg and its direct environs to rural and structurally weak sub-regions such as the administrative district Lüchow-Dannenberg.

The region offers a high standard of living and diversity, with a defined urban core and rural areas. The international airport, the port of Hamburg with cruise ships and international train connections define the role of the Metropolitan region in the international network. These international traffic functions are all concentrated in the core, or the city of Hamburg (Grotheer, 2011). The region has qualified specialist companies prepared to innovate, and highly qualified research centers. For example, the 9,000 researchers and 85,000 students at 27 universities emphasize the position of the region as an academic/scientific location.

3.2.1 The KLIMZUG-NORD Project

KLIMZUG (Klimawandel in Regionen zukunftsfähig gestalten) is a funding initiative of the Bundesministerium für Bildung und Forschung (BMBF), which supports the preparation for adapting to climate change. The purpose of this funding initiative is to embed the awareness of the need for adaptation to climate change in our society. The BMBF is supporting seven model regions, from 2009 through 2014, with a total of approximately €83 million.

The KLIMZURD-NORD project, one of the seven national pilot projects, is focused in the Hamburg Metropolitan Region. The project is described (KLIMZUG-Nord Strategische Anpassungsansätze zum Klimawandel in der Metropolregion Hamburg, 2012) as:

“Partners of KLIMZUG-NORD are going to research the consequences of climate changes to urban areas, agricultural sites and the tidal riverbed of the Elbe within the city of Hamburg. Taking into account research data, environmental planning, city law, and economic plans, a range of action plans are going to be recommended. The target entails a coordinated action plan for the city regions, including a master plan which reaches to the year 2050.”

The overall KLIMZURG-NORD project is focused on three topics – estuary river management, integrated urban development, and sustainable cultivated environment. The overall project is coordinated by “TuTech Innovation” and has a total of 76 partners and supporters. There are 25 sub-projects.

3.3 South Florida Metropolitan Region

The U.S. Office of Management and Budget and the US Census designate metropolitan areas in the United States. The area designated as the South Florida Metropolitan Region is made up of three counties (Broward, Miami-Dade and Palm Beach), and had a 2010 population of 5,564,635 (8th largest in the US).

The MSA itself is separated into three distinct divisions that fall along county lines. The Miami-Miami Beach-Kendall divison (Miami-Dade County) has a population of 2,496,435, the Fort Lauderdale-Pompano Beach-Deerfield Beach division (Broward County) has a population of 1,748,066 and the West Palm Beach-Boca Raton-Boynton Beach (Palm Beach County) divsion has a population of 1,320,134. The OMB also designates principal cities; these are: Miami, Fort Lauderdale, Pompano Beach, West Palm Beach, Miami Beach, Kendall, Boca Raton, Deerfield Beach, Boynton Beach, Delray Beach and Homestead.

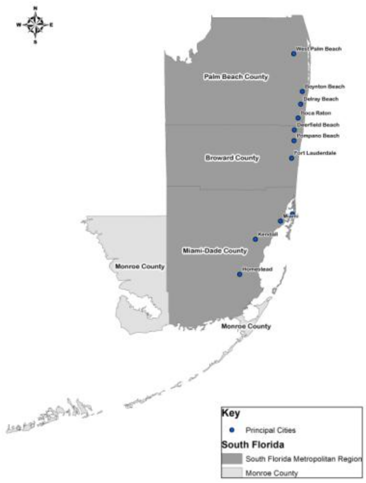

Fig. 2: South Florida Metropolitan Region.

3.3.1 Southeast Florida Regional Climate Change Compact

The Southeast Florida Regional Climate Change Compact was the principal result of the Southeast Florida Climate Leadership Summit, held in 2009. The compact’s principal members are the four counties that make up the Southeast Florida region (Broward, Miami-Dade, Monroe, and Palm Beach; Monroe is the county that includes the famous Florida Keys). The compact became official with the signing in January 2010. This compact allows the counties a framework and structure for working together by developing a coordinated response to any proposed climate legislation policies, to dedicate staff time and resources towards the creation of a Southeast Florida Regional Climate Change Action Plan, which would include mitigation and adaptation strategies, and to meet annually in Regional Climate Summits to mark progress and identify emerging issues. (SOUTHEAST FLORIDA REGIONAL CLIMATE CHANGE COMPACT, 2012)

The Draft Regional Climate Action Plan was released on December 9th, 2011 (open for public comment until March 16th, 2012). This plan is both a summary of work done and an update on what is still left to accomplish. Among the completed highlights are the establishment of a Greenhouse gas Emission base line for Southeast Florida and the creation of a unified methodology among all four counties in regards to sea level rise.

There are 91 nodes (actors) involved in three major work groups (tasked with data collection and eventual recommendations). These are: Built Environment, Transportation, and Land and Natural Systems. To date, recommendations are grouped in six categories: (1) Sustainable Communities and Transportation Planning; (2) Water Supply, Management and Infrastructure; (3) Natural Systems and Agriculture; (4) Energy and Fuel; (5) Risk Reduction and Emergency Management; and (6) Outreach and Public Policy.

4 SOCIAL NETWORK ANALYSIS: WHAT IS IT?

Social network analysis (SNA) is not new; indeed, the idea has been around for over a century. Its use as a systematic tool dates from the mid 20th century (A.J. Barnes, 1954). What began as a "metaphor" has morphed into an "approach" and is approaching "paradigmatic" status. The key difference between SNA and traditional social science analysis is the focus of measurement. In SNA, the key attribute to be measured are "links" between actors (called nodes); in traditional social science analysis, the key attributes to be measured are aspects of the nodes (income, race, gender, etc.).

This section relies on two major sources – Knoke's (1982) introduction to social network analysis and Hanneman and Riddle's (2005) manual for the UCINET program. The discussion is structured into methodological perspectives and a discussion of the specific measures and their operational versions.

4.1 Methodological Perspective(s)

Freeman (2006) and Wellman & Berkowitz (1988) distinguish major analytic tendencies. These are: (1) there is no assumption that groups are the building blocks of society; (2) a focus on the structure of ties rather than treating individuals (persons, organizations, states) as discrete units of analysis; and (3) a focus on how the network affects ties.

Generally, the shape of the social network determines a network's usefulness to its individuals. For example, prevailing wisdom suggests that: (1) smaller, tighter networks can be less useful to their members than networks with lots of loose connections (weak ties) to individuals outside the main network; (2) more open networks, with many weak ties and social connections, are more like to introduce new ideas and opportunities to their members than closed networks with many redundant ties. In terms of environment, centralized structures may perform better when there is not much in the way of upheaval or change, but when there is a lot of change, a less centralized structure may be preferrable (Knoke and Kuklinski, 1982).

4.2 Measures

SNA analysts generally focus on a number of attributes of the network, including size and core component, connectivity, and centrality and cluster analysis. We discuss each below. We used UCINET to calculate these parameters of the network. The specific measures produced by UCINET are also listed below.

4.2.1 Size

The size of the network is critical in defining the social structure. Larger networks require greater resources for developing and maintaining social relationships (Hanneman & Riddle, 2005). Focusing on the number of actors – size of the network, the number of possible ties and the number of actual ties – is the first step in analyzing a network. The size of a network and the number of ties is directly related, as Hanneman and Riddle note, 2005, p. 80).

"Imagine a group of 12 students in a seminar. It would not be difficult for each of the students to know each of the others fairly well, and build up exchange relationships (e.g. sharing reading notes). Now image a large lecture class of 300 students. It would be extremely difficult for any student to know all of the others, and it would be virtually impossible for there to be a single network for exchanging reading notes. Size is critical for the structure of social relations because of the limited resources and capacities that each actor has for building and maintaining ties."

This data gives us the first critical information about the network and about the actors, specifically how many ties are possible compared to how many are present and also how many ties each actor has (Hanneman and Riddle, 2005).

4.2.2 Connectivity

Going a step further in analyzing a network, examining the connectivity and the distance gives a more detailed insight of the network.

The distance is the amount of steps is needed to move information from one node to another. It shows us how embedded a stakeholder is (Hanneman and Riddle, 2005). If the distance is 1 between two stakeholders, then these are directly connected and the information flow is the shortest and does not have to go through anyone else. This short path between two nodes is called a geodesic (Knoke and Kuklinski, 1982).

The maximum number of steps or "largest geodesic distance" defines the diameter of the network (Hanneman and Riddle, 2005). The average distance is the mean of all geodesic distances and gives us on average the shortest distance needed to move from one node to another.

According to Hanneman and Riddle (2005) the distance-based cohesion or "compactness" coefficient is in the range of values from 0 to 1, whereby closer to 1 the network is more cohesive or "well connected".

The density of a network is easily derived. It is the number of the present ties (a) divided by the amount of possible ties (N2-N, self-directed relations are not permissible in our case) (Knoke and Kuklinski, 1982). The dependence of the number of stakeholders, or the size of the network itself, is trivial. Thus, a large network with the same number of relationships has a lower density than it is the case in a smaller network (Schnegg and Lang, 2002).

4.2.3 Cluster Analysis

The clustering coefficient is a measure of the likelihood that two associates of a node are associated themselves. A higher clutering coefficient indicates a greater "cliquishness". UCINET gives us two alternative measures for clustering. Again quoting from Hanneman and Riddle, 2005, p 105,

"The "overall" graph clustering coefficient is simply the average of the densities of the neighborhoods of all of the actors. The "weighted" version gives weight to the neighborhood densities proportional to their size; that is, actors with larger neighborhoods get more weight in computing the average density."

Centrality is a rough indication of the social power of a node based on how well they "connect" to the network. The Bonacich Power coefficient measures the power of the actors. The idea is that stakeholders who have more ties than others may have a good position. But following Bonacich, a stakeholder does not have power through it is the amount of connections but due to its position in its neighborhood. If your neighbors are dependent on you, that puts you in a powerful position. Here, the amount of connections is not as important as having the right connections.

Example:	Stakeholder A	Stakeholder B	Stakeholder C
Stakeholder A		1	0
Stakeholder B	1		1
Stakeholder C	0	1	

Figure 3: How the Matrix is filled

5 DATA COLLECTION AND PROCESSING

In order to best encapsulate and capture the relationship of the actors, a matrix was used to map the connections. The matrix is a straightforward way to present the relationship among (between) stakeholders. The UCINET software uses the matrices to perform its calculations. The matrix consists of n rows and m columns. The number of stakeholders determines the size of "n" and "m". The matrix shows the relationship between the members of the project by using the number 1 to represent a connection and the number 0 to represent no connection. This is done regardless of the degree of intensity of the relationship, see Figure 3.

The example matrix consists of three rows and three columns. Stakeholder B has a connection to stakeholder A and C, and thus has a "1" in its cell. Relationships between stakeholders and themselves are excluded.

5.1 Preparing the Matrix for Hamburg

The first step was to collect all stakeholders that are part of the project KLIMZUG-NORD. The project website had a subsection labeled "Partner" in which there were lists of the partners and supporters of the project, those were already briefly discussed above. These names were used to create the framework of the matrix.

After this step all sub-projects of KLIMZUG-NORD were analyzed looking for the relationships between stakeholders. If the stakeholders work together on a project, like for example the Technische Univeristät Hamburg-Harburg (TUHH) and the company Wasserbau River and Coastal Engineering, like they do in the project Hochwasserschutz an tidebeeinflussten Nebengewässern der Elbe, then there is a connection and this was recorded in the matrix. Actors that were not listed in the partner list described above but were listed as stakeholders in a specific sub-project were added to the matrix. TuTech Innovation is the coordinator of the whole project, and because of this, they appeared in every sub project. This was also true for the Bundesministerium für Bildung und Forschung, the Freie und Hansestadt Hamburg and the Hamburg Metropolitan Region. These institutions finance the project by way of the KLIMZUG funding initiative.

5.2 Preparing the Matrix for South Florida

The data collection for the creation of the matrix was done by examining the documents that the Compact had created, much in the same manner as the Hamburg portion of this analysis, and seeing which organization and/or governmental agency had collaborated on a project. The first step was to see if the counties themselves had created units for collaboration on this project. Broward County created the Broward County Climate Change Task Force (BCCCTF) and was a mix of private and public organizations. The other counties also created units but those were made up of solely county groups and did not have the diversity that Broward County did. The next step was to look at the Draft Regional Climate Action Plan, which had been put up for public review on December 9th, 2011 and is open for review until March 16th, 2012. This plan included a section titled, Contributing technical and Staff Experts. This part of the appendix broke down the contributors into three groups: Built Environment Work Group Participants, Land and Natural Systems Work Group Participants, and Transportation Work Group Participants. These three groups along with the Broward Climate Change Task Force were used as the basis for the analysis.

Organizations and/or groups were deemed to be connected if they resided on the same list of members. So everybody in the BCCCTF would be connected to everyone else in that group and would be represented with a 1 in the matrix. A member on that list would only be considered as connected to someone in another list if they were also on the other list. So if the South Florida Water Management District (SFWMD) was present in the BCCCTF and the Land and Natural Systems Work Group Participants list, then the SFWMD would be connected to every member in both of those groups. Care was taken to leave departments within a county as separate if they were listed as separate entities. So if example if both Broward County and Broward County Planning and Zoning were listed, then they would both have separate entries into the matrix. This was done as it would also allow for mapping of interdepartmental connections.

6 RESULTS

Perhaps the most compelling result from the UCINET program is a graphic representation of the SHAPE of the social network. We show this first (Figure 4), and then examine in more detail the results of the more "numeric" parameters (Table 1).

The shape of the network also gives insight into how the network functions. The results of the UCINET program for the two planning for adaption to climate change reveal vastly different shapes. The KLIMZUG-NORD network resembles a star. We believe that this result is due to the influence of both the coordinating stakeholder and the financing stakeholder that are connected to every member of the network. Indeed, an interview with the public relations office of TuTech Innovation confirms the need for a coordinating stakeholder – the face in front of the funders.

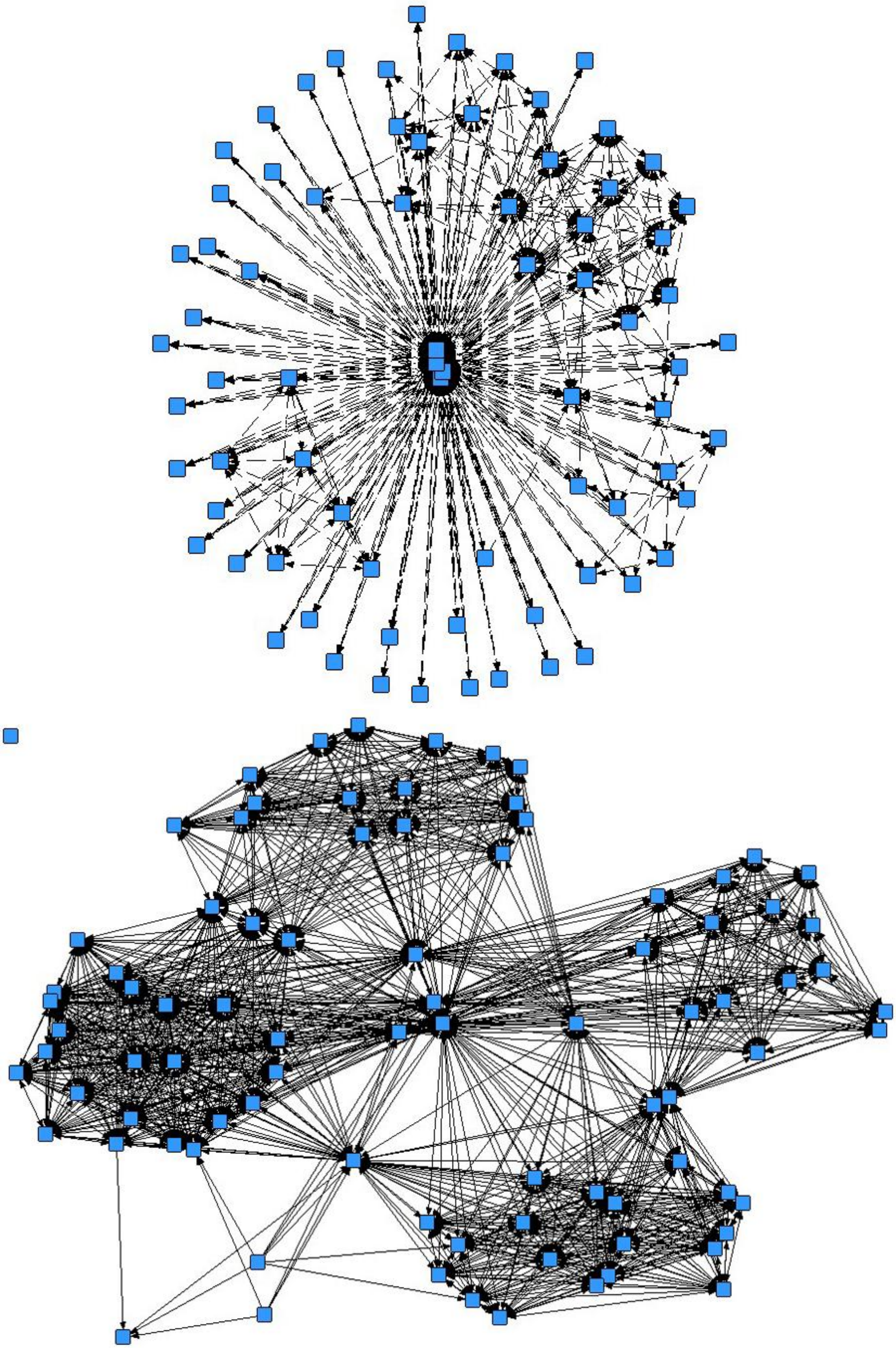

Fig. 4: Network Maps for Hamburg and South Florida

The shape of the Southeast Florida Regional Climate Change Compact network resembles a spider web with four big sub-webs connected through the main stakeholders – the individual counties. The four sub-groups represent the three technical work groups (Built Environment, Transportation, and Land and Natural Systems) but also the Broward County Climate Change Task Force. The shape shows that each group is a relatively self-contained entity.

6.1 Size Results/Analysis

The size of both planning networks is roughly similar. KLIMZUG-NORD (hereafter KN in the remainder of section 6) has 76 partners/stakeholders. The Southeast Florida Regional Climate Change Compact (herafter

ISBN: 978-3-9503110-2-0 (CD-ROM); ISBN: 978-3-9503110-3-7 (Print)
Editors: Manfred SCHRENK, Vasily V. POPOVICH, Peter ZEILE, Pietro ELISEI

SFRCCC in the remainder of section 6) has 91 identified institutional partners. While these numbers are not exactly the same, they are in some sense roughly proportional. This reduces one of the sources of variation between the two case study networks.

South Florida				Hamburg		
91			Number of Stakeholders	76		
8190			Number of possible Ties	5700		
2358			Number of Ties	845		
29.44%			Density	15.23%		
1.713			average Distance	1.848		
0.622			Distance-based cehesion (Compactness)	0.576		
0.378			Distance-weighted fragmentation (Breadth)	0.424		
5			longest Distance	2		
0.896			Overall graph clustering coefficent	0.917		
0.767			Weighted Overall graph clustering coefficient	0.273		
Institution	Clus Coef	nPairs	Clustering Coefficients	Institution	Clus Coef	nPairs
BC NRPMD	0.400	1953		Stadt Hamburg	0.129	2701
Broward County	0.461	1431		Bundesministerium für Bildung und Forschung	0.129	2701
Palm Beach County	0.504	1128		Metropolregion Hamburg	0.129	2701
Monroe County	0.496	1128		TuTech Innovation GmbH	0.129	2701
Maimi-Dade County	0.872	435		Universität Hamburg-Harburg	0.532	325
Institution	Power	Normal	Bonacich Power	Institution	Power	Normal
BC NRPMD	63	2.225		Stadt Hamburg	74	3.856
Broward County	50	1.766		Bundesministerium für Bildung und Forschung	74	3.856
Palm Beach County	45	1.589		Metropolregion Hamburg	74	3.856
Monroe County	45	1.589		TuTech Innovation GmbH	74	3.856
Miami-Dade County	27	0.953		Universität Hamburg-Harburg	26	1.355

Table 1: Coefficient and Parameter Results for Hamburg and South Florida Networks

6.2 Connectivity and Density Results/Analysis

The possible number of ties is based in part on the number of participants in the network. In our two examples, the SFRCCC network has 2,358 possible ties; the KN network has 845 possible ties.

UCINET computes a number of connectivity and density parameters. The average distance of the KN network is 1.848 compared to 1.713 for the SFRCCC network. This indicates that the average number of steps between individual stakeholders is shorter in South Florida than in Hamburg. On the other hand, the longest distance between stakeholders is longer in South Florida than in Hamburg, 5 steps to 2 steps. This might indicate that the connections in the South Florida network tend to be more local and not network wide. This can be seen in the visualization and reinforces the notion that the sub groups are self-contained.

The compactness coefficient measures how "well" the network is connected. This coefficient has a value of .622 for the SRFCCC network and a value of .576 for the KN network. This is also reinforces the fact that sub-groups in South Florida are more connected within.

The density coefficient measures how "solid" the network is. The SFRCCC has a density coefficient of 29.44% compared to the KN network derived coefficient of 15.23%. This measure reinforces the visual graphic representation of the two planning networks. The KN network operates in a hub-and-spoke fashion; stakeholders are connected by the fact that all have a common partner, which are coordinating stakeholder and the financers. This cuts down on connections between stakeholders and lowers the density. The SRFCCC network is similar to this but has more interconnectivity between stakeholders within a sub-group, which accounts for the higher density.

6.3 Centrality and Cluster Results and Analysis

UCINET returns both overall and weighted graph clustering coefficients. The weighted overall graph clustering coefficient shows a huge difference between the SFRCCC network coefficient of .767 and KN coefficient of .273. This coefficient indicates the weight densities of their neighborhood proportional to their size. In the KN network they are not dense or big neighborhoods and that's the coefficient is that low. In the case of the overall graph, the KN clustering coefficient is .896 compared to .917 for SFRCCC; these are nearly identical. This is because this value shows us the average of all the actors relating to the densities of their neighborhoods. The coefficient per stakeholder shows us that the technical groups in the SFRCCC network operate in their own neighborhood; we daresay that every technical group has its own sub-network. This is not the case in the KN network as the four most powerful players are only in one neighborhood but are connected to all other stakeholders in the network.

UCINET also computes the relative power of individual stakeholders by calculating Bonacich Power coefficients. The Bonacich results reveal that the most powerful stakeholders in the SFRCCC network are the four counties and the Broward County Office of Natural Resources Planning and Management. This is perhaps an obvious result, but encouraging in methodological terms since it captures the real organization of the SFRCCC effort. The same is also apparent in the KN network. The most important stakeholder is a university – the TuTech Innovation GmbH, which has the mission to connect Hamburg University of Technology with businesses. The TuTech acts as the coordinating stakeholder and because of this has the most power. Only the financing stakeholders – the Freie und Hansestadt Hamburg, the Bundesministerium für Bildung und Forschung and the Hamburg Metropolitan Region have the same power.

7 DISCUSSION OF RESULTS IN TERMS OF EXPECTATIONS IN THE CASE STUDY

Though nearly the same size as expected, the two social network graphic and numerical results show vastly different "shapes" and "values". One is a top-down-structure and one is bottom-up. As we learned, the shape and the institutionalization of a network is based on the genesis, the structure of stakeholders within a governance system, and the reasons why this network was implemented.

The two networks validate the assumption that German metropolitan areas are more likely to have a centralized governmental structure whereas US metropolitan areas have more decentralized structures. The KLIMZUG-NORD project is a metropolitan regional government project while the Southeast Florida Regional Climate Change Compact shows an example of a bottom-up approach. The difference is reflected in the strong suspicion that some parts of the South Florida network existed before the region-wide project. In the case of KLIMZUG-NORD we weren't able to tell if there had been such connections.

However, both networks confirm the idea that municipal governments play an important piece in the governance of metropolitan area. The most connected and powerful stakeholders are "government players". These give the resources and have access to governmental authority. In the case of KLIMZUG-NORD the stakeholders, the Hamburg Metropolitan Region and the Freie und Hansestadt Hamburg, provide the network access to the local metropolitan government or are in fact the metropolitan government. The Bundesministerium für Bildung und Forschung connects the project with the state. In the South Florida Network, the counties are the governmental authorities; this pattern points to the overarching need for interjurisdictional collaboration.

8 REFERENCES

BARNES, A.J. Class and Committees in a Norwegian Island Parish. In: Human Relations, Vol. 7, pp. 39-58. 1954.

BICKERS, K.N., and R.M. STEIN: Interlocal Cooperation and Distribution of Federal Grant Awards: Paper presented at a Dovoe L. Moore Center conference, Decentralized Governance: The Implications of Government Organization in Metropolitan Areas, Tallahassee, Fla., 2002

FEIOCK, Richard C.: Introduction: Regionalism and Institutional Collective Action. In Metropolitan Governance – Conflict, Competition, and Cooperation, Washington, D.C.: Georgetown University Press, 2004.
FREEMAN, L. The Development of Social Network Analysis: A Study in the Sociology of Science. Vancouver: Empirical Press, 2004.
GROTHEER, S. Das Konzept der Europäischen Metropolregionen in Deutsc
rnberg, Kaiserslautern, 2011.
HEIMPOLD, G. Neue Orientierung für eine deutsche Raumentwicklungspolitik? Bericht über einen Workshop im IWH. In: Wirtschaft im Wandel, Vol. 2/2006, pp 60-65. 2006.
KNOKE, D. & J.H. KUKLINSKI: Network Analysis. Beverly Hills: Sage Publications, 1982.
OAKERSON, R J. The Governance Effects of Metropolitan Reform: A Theoretical Inquiry, 2002.
OSTROM, E. Understanding Institutional Diversity. Princeton: Princeton University Press, 2005.
SCHNEGG, M. & H. LANG: Netzwerkanalyse: Eine praxisorientierte Einführung. In: Methoden der Ethnographie, Vol 1. 2002.
SALET, W.A., A. THORNLEY & A. KREUKELS. Metropolitan Governance and Spatial Planning: Comparative Case Studies of European City Regions. London: Spon Press, 2003.
SAVITCH, H.V. & R.K. VOGEL. Introduction: Paths to New Regionalism. In State and Local Government Review, Vol 12 (3), pp. 158-168, 2000.
WASSERMAN, S. & K. FAUST. Social Network Analysis: Methods and Applications. Cambridge: Cambridge University Press, 1994.
WHEELER, S. The New Regionalism: Key Characteristics of an Emerging Movement. In: Journal of the American Planning Association, Vol 68 (3), pp. 267-278, 2002.
WILLIAMS, O.P. Metropolitan Political Analysis. New York: Free Press, 1971.
WELLMAN, B. and S.D. BERKOWITZ. Social Structures: A Network Approach. Cambridge: University of Cambridge, 1988.
BUNDESMINISTERIUM FÜR BILDUNG UND FORSCHUNG
(http://www.bmbf.de/press/3169.php) [2012]
HANNEMAN, R. & M. RIDDLE: Introduction to social network methods. Riverside: University of California,
(published in digital form at http://faculty.ucr.edu/~hanneman/) [2005]
KLIMZUG KLIMAWANDEL IN REGIONEN
(http://www.klimzug.de/de/109.php) [2012]
KLIMZUG-NORD Strategische Anpassungsansätze zum Klimawandel in der Metropolregion Hamburg
(http://klimzug-nord.de/index.php/lang/en/page/2009-07-21-Targets) [2012]
KLIMZUG-NORD Strategische Anpassungsansätze zum Klimawandel in der Metropolregion Hamburg
(http://klimzug-nord.de/index.php/lang/en/page/2009-07-21-KLIMZUG-NORD-Home) [2012]
KLIMZUG-NORD Strategische Anpassungsansätze zum Klimawandel in der Metropolregion Hamburg
(http://klimzug-nord.de/index.php/page/2009-03-30-PARTNER) [2012]
KLIMZUG-NORD Strategische Anpassungsansätze zum Klimawandel in der Metropolregion Hamburg
(http://klimzug-nord.de/index.php/page/2009-03-30-KOORDINATION) [2012]
KLIMZUG-NORD Strategische Anpassungsansätze zum Klimawandel in der Metropolregion Hamburg
(http://klimzug-nord.de/index.php/lang/en/page/2009-07-21-Topics) [2012]
KLIMZUG-NORD Strategische Anpassungsansätze zum Klimawandel in der Metropolregion Hamburg
(http://klimzug-nord.de/index.php/page/2009-03-30-THEMEN) [2012]
KLIMZUG-NORD Strategische Anpassungsansätze zum Klimawandel in der Metropolregion Hamburg
(http://klimzug-nord.de/index.php/lang/en/page/2009-07-21-Subdivision) [2012]
METROPOLREGION HAMBURG
(http://english.metropolregion.hamburg.de/academia/) [2012]
SOUTHEAST FLORIDA REGIONAL CLIMATE CHANGE COMPACT
(http://www.southeastfloridaclimatecompact.org/) [2012]
STATISTIKPORTAL DER METROPOLREGION HAMBURG
(http://metropolregion.hamburg.de/statistikportal-tabellen/) [2012]
TU TECH INNOVATION GmbH (TuTech)
(http://tutech.net/#) [2012]
U.S. CENSUS BUREAU: Census Geographic Glossary
(http://www.census.gov/geo/lv4help/cengeoglos.html) [2012]
U.S. CENSUS BUREAU
(http://www.census.gov/population/metro/) [2012]