

Evaluating networks of a Teacher-Research Experience program with social network analysis

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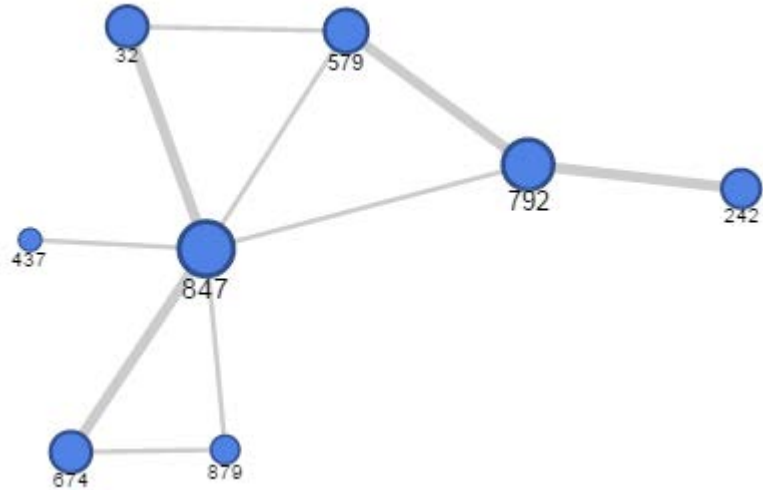
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What is Social Network Analysis?

Social network analysis is the mapping and measuring of relationships between people, groups, organizations, or other entities.

The **nodes** in the network are the people while the **ties** show relationships between the nodes.

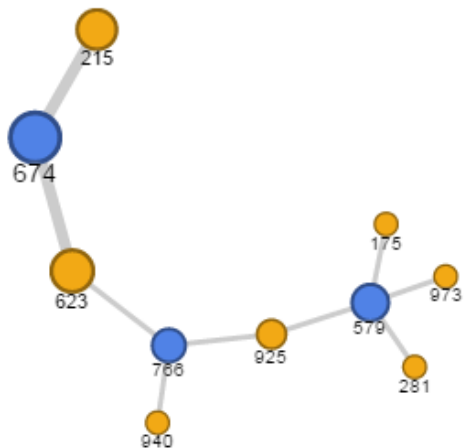
Teacher at Sea Alumni Network (n=11)



# ties	density	avg value
10	36%	1.4

● = Teacher at Sea

Teachers at Sea, NOAA Scientists, Educators & Corps (n=11)

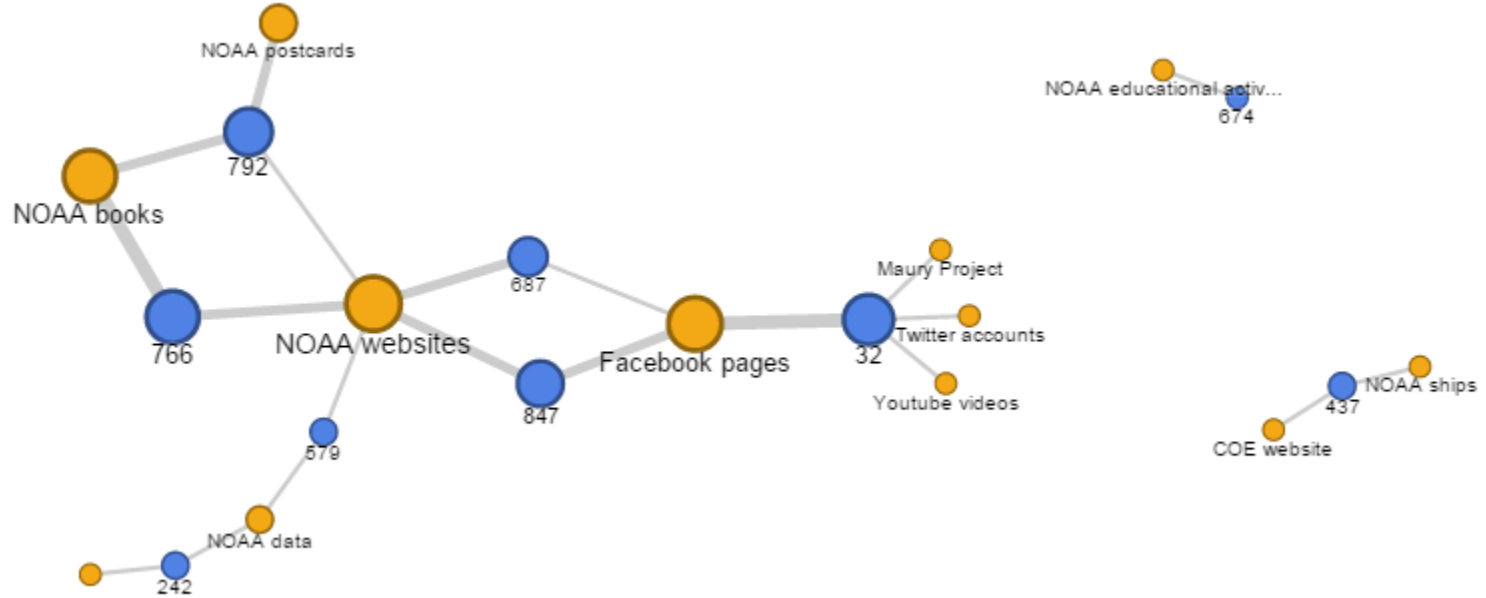


# ties	density	avg value
20	7%	1.3

● = Teacher at Sea ● = NOAA Scientist, Educator, Corps

Teachers at Sea & NOAA Resources

(n=1)



# ties	density	avg value
20	10%	1.4

● = Teacher at Sea ● = NOAA Resource

Evaluation Questions

To what extent are Teachers at Sea continuing to work with scientists and use NOAA resources?

To what extent are Teachers at Sea connected with fellow TAS alumni?

Hypothesis: Sustained network membership is more likely to support the development of long-term impacts stemming from the TRE.

Objectives & Actions

Improve network structure

- Increase membership in the network

Improve network health

- Support opportunities to forge connections
- Provide a communications infrastructure to sustain connections

Resources

1. [Online repository](#) on github with step-by-step instructions, datasets, survey instrument
2. [Google Fusion Tables](#); [Network Charts](#)
3. [The State of Network Evaluation](#)
4. Schroyer, M. M., Abd-El-Khalick, F., Martin, A., & Haythornthwaite, C. (2014, April). *A longitudinal, district-wide social network analysis of the impact of science teacher leaders*. Presented at the annual meeting of the National Association of Research on Science Teaching, Pittsburgh, PA.
5. Christakis, N. A. & Fowler, J. A. (2009). [*Connected: The surprising power of our social networks and how they shape our lives*](#). New York: Little, Brown and Company.



Thanks!

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How to Capture Data

One-page paper survey at alumni workshop with these open-ended questions:

1. List the names of NOAA scientists and/or staff you have interacted with in the last year. Do not include NOAA TAS staff. Put a star next to the ones you have communicated with most.
1. List the names of TAS alumni you have interacted with in the last year and write next to each name how you met her/him. Put a star next to the ones you have communicated with most.
1. Write the names of all NOAA educational and science resources you have used in the last year. Put a star next to the ones that you have found to be most valuable.

Calculating Statistics

For undirected networks:

Number of ties = count the number of ties between each node

Density = number of ties/total possible number of ties, $N * (N-1)/2$

e.g. $8*7/2=28 \Rightarrow 10/28 = 36\%$

Avg value = count the total value of the ties/number of ties

e.g. $14/10 = 1.4$