Stefano Allesina

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Education

Ph.D. Ecology, University of Parma - Italy, 2005
Dissertation: *Ecological Flow Networks: Topological and Functional Features*
Major Advisor: Dr. Antonio Bodini
Committee: Dr. Luis G. Abarca-Arenas, Prof. Giulio De Leo, Dr. Stefano Leonardi.

B.S. (Laurea) Environmental Sciences, University of Parma - Italy, 2001
Dissertation: *Sviluppo di un modello di simulazione abbinato a un algoritmo qualitativo per lo studio dei sistemi ambientali complessi*
Development of a qualitative algorithm for the study of complex environmental systems. In Italian.
Advisors: Dr. Antonio Bodini, Dr. Alessandro Zaccagnini

Research

Postdoctoral Associate Sept 2007 –
NCEAS *University of California Santa Barbara*
"Reverse Engineering of Ecological Networks: From the Disassembly to the Construction of Robust Networks"

Postdoctoral Fellow Oct 2005 – Sept 2007
Mercedes Pascual *University of Michigan*
Food webs theory, stability analysis, mutualistic networks, food webs evolution, null models.

Postdoctoral Fellow Oct 2004 – Oct 2005
Scott D. Peacor *Michigan State University, NOAA GLERL*
DOVE - Digital Organisms in a Virtual Ecosystem, phenotypic plasticity, adaptive behavior, agent based modeling.

Visiting Scholar Feb 2004 – May 2004
Robert E. Ulanowicz *Chesapeake Biol. Lab. University of Maryland*
Network Analysis, cycling index, species role in food webs, sociometric approaches to ecological networks.

Publications

1. **Allesina, S.**, Bodini, A., Pascual, M. 2008. Functional and redundant connections in food webs. Phil. Trans. Roy. Soc. B. *Accepted*
2. Bodini, A., Bellingeri, M., **Allesina, S.**, Bondavalli, C. 2008. Using food web dominator trees to catch secondary extinctions in action. Phil. Trans. Roy. Soc. B. *Accepted*
3. **Allesina, S.**, Alonso, D., Pascual, M. 2008. A General Model for Food Web Structure. Science, 320(5876):658–661.
   Reviewed for "Faculty of 1000" by J. Bascompte: **"This contribution will certainly pave the road for a deeper understanding of the basic rules shaping the web of life."**
   http://www.f1000biology.com/article/id/1108351
4. Lafferty, K.D., **Allesina, S.**, Arim, M., Briggs, C.J., DeLeo, G., Dobson, A.P., Dunne, J.A., Johnson, P.T.J., Kuris, A.M., Marcogliese, D.J., Martinez, N.D., Memmott, J., Marquet, P.A., McLaugh-

lin, J.P., Mordecai, E.A., Pascual, M., Poulin, R., Thieltges, D.W., 2008. Parasites in food webs: the ultimate missing links. Ecology Letters, 11(6):553–546.

5. **Allesina, S.**, Pascual, M. Network structure, predator-prey motifs, and stability in large food webs. Theoretical Ecology, 1(1):55–64.
   Reviewed for "Faculty of 1000" by M. Holyoak: **"Food web theory just got really interesting again![...]"** *http://www.f1000biology.com/article/id/1104458*
6. Peacor, S.D., **Allesina, S.**, Riolo, R.L., Hunter, T., 2007. A computational system, DOVE (Digital Organisms in a Virtual Ecosystem), to study phenotypic plasticity in ecosystems. Ecological Modelling, 205(1–2):13-28.
7. **Allesina, S.**, Bodini, A., Bondavalli, C., 2006. Secondary Extinctions in Ecological Networks: Bottlenecks Unveiled. Ecological Modelling, 194(1–3):150–161.
8. Peacor, S.D., **Allesina, S.**, Pascual, M., Riolo, R.L., 2006. Phenotypic plasticity increases species coexistence by altering fitness surface. PLoS Biology, 4(11): e372.
9. Bondavalli, C., Bodini, A., Rossetti, G., **Allesina, S.**, 2006. Detecting stress at the whole ecosystem level. The case of a mountain lake: Lake Santo (Italy). Ecosystems, 9(5):768–787.
10. Scotti, M., **Allesina, S.**, Bodini, A., Bondavalli, C., Abarca-Arenas, L.G., 2006. Effective trophic positions in simple networks. Ecological Modelling, 198(3–4):495–505.
11. **Allesina, S.**, Bodini, A., 2005. Food web scaling relation: efficiency revisited. Ecological Complexity, 2(4):323–338.
12. **Allesina, S.**, Bondavalli, C., Scharler, U.M., 2005. The consequences of the aggregation of detritus pools in ecological networks. Ecological Modelling, 189(1–2):221–232.
13. **Allesina, S.**, Bodini, A., Bondavalli, C., 2005. Ecological subsystems via graph theory: the role of strongly connected components. Oikos, 110(1):164–176.
14. **Allesina, S.**, Ulanowicz, R.E., 2004. Cycling in ecological networks: Finn's index revisited. Computational Biology and Chemistry, 28(3):227–233.
15. **Allesina, S.**, Bodini, A., 2004. Who dominates whom in the ecosystem? Energy flow bottlenecks and cascading extinctions. Journal of Theoretical Biology, 230(3):351–358.
16. **Allesina, S.**, Bondavalli, C., 2004. WAND: an Ecological Network Analysis user-friendly tool. Environmental Modelling and Software, 19(4):337–340.
17. **Allesina, S.**, Bondavalli, C., 2003. Steady state of ecosystem flow networks: a comparison between balancing procedures. Ecological Modelling, 165(2–3):231-239.

Other Publications

18. **Allesina, S.**, Bodini, A. Ascendency. For: S.E. Jørgensen (Editor), Encyclopedia of Ecology - Elsevier.
19. **Allesina, S.** Cycling and Cycling indices. For: S.E. Jørgensen (Editor), Encyclopedia of Ecology - Elsevier.
20. Battini, D., Persona, A., **Allesina, S.**, 2007 Towards a use of network analysis: quantifying the complexity of supply chain networks. International Journal of Value Chain Management 1(1):75–90.
21. Battini, D., Regattieri, A., Azzi, A.,**Allesina, S.**, Performance Measurement in Supply Chain: New Network Analysis and Entropic Indexes. *in press*
22. Bodini, A., Bondavalli, C., **Allesina, S.**, 2007. L'ecosistema e le sue relazioni. Idee e strumenti per la valutazione di impatto e ambientale e di incidenza. Franco Angeli, Milan - Italy. (*The ecosystem and its relations. Ideas and tools for environmental impact assessment.*) Textbook - In italian.
23. **Allesina, S.**, Zaccagnini, A., Bodini, A., 2001. Un modello di simulazione abbinato ad un algoritmo qualitativo per lo studio dei sistemi ecologici. (In Italian) S.It.E. (Italian Society of Ecology) Atti 2001 CDROM

Submitted Manuscripts

24. **Allesina, S.**, Jordan, F., Libralato, S., Luckzcovic, J., Quince, C. et al. Mesoscale effects in ecological networks. *in review*
25. Bodini, A., Bondavalli, C., **Allesina, S.**, Draghetti, T. Towards a sustainable use of water resources: testing retrofit devices performance to reduce residential water demand. *in revision*

Manuscripts in preparation

26. **Allesina, S.**, Pascual, M. Asymmetry can promote instability in coevolutionary networks. *in revision*
27. **Allesina, S.** Optimal degree of resolution in food webs using Akaike's AIC. *in preparation*
28. Scotti, M., Bondavalli, C., Bodini, A., **Allesina, S.** The higher the better? Linking trophic position and flows topology in ecosystems. *in preparation*
29. **Allesina, S.**, Alonso, D., Pascual, M. The structure of mutualistic networks: nestedness and beyond. *in preparation*
30. **Allesina, S.**, Pascual, M. Googling food webs: can an eigenvector detect endangered species? *in preparation*
31. **Allesina, S.**, Pascual, M. A simple and adaptive model of food web assembly. *in preparation*
32. **Allesina, S.**, Bodini, A., Dunne, J.A., Pascual, M. Patterns of indirect connectance in food webs. *in preparation*
33. Peacor, S. D., **Allesina, S.** Phenotypic plasticity stabilizes competitive interactions. *in preparation*

Talks

- **Allesina, S.**, Pascual, M. Googling food webs: Measuring species' importance in food webs. *The Ecological Society of America 93rd Annual Meeting* - Aug. 4 2008, Milwaukee, WI.
  Covered by Emma Marris for Nature News: Google tool identifies linchpin species.
  http://www.nature.com/news/2008/080806/full/news.2008.1010.html.
- **Allesina, S.** The spider and the web: inference in ecological networks. *NCEAS Ecolunch*, May 5 2008, Santa Barbara, CA.
- **Allesina, S.** The spider and the web: the structure, robustness and dynamics of ecological networks. *Computer Science Dept. - U. of Chicago*, April 16 2008, Chicago, IL. *Invited*.
- **Allesina, S.** Playing dice with species: how null models can explain the structure of ecological networks. *Early Career Scientists Symposium*, March 15 2008, Ann Arbor, MI. *Invited*.
- **Allesina, S.** & Pascual, M. Assembly and disassembly of ecological networks: Where are we now and where are we going next?. *The Ecological Society of America 92nd Annual Meeting* - Aug. 8 2007, San Jose, CA. *Invited*.
- **Allesina, S.** Alonso, D. & Pascual, M. Potential Niches and Forbidden Links Explain the Structure of Food Webs. *Society of Mathematical Biology Annual Meeting* - Aug. 3 2007, San Jose, CA. *Invited*.
- **Allesina, S.** Null models for food web structure. *University of Parma* - Feb. 20 2007, Parma, Italy. *Invited*.
- **Allesina, S.** The structure of ecological networks. *Niels Bohr Institute - Center for Models of Life* - Feb. 15 2007, Copenhagen, Denmark. *Invited*.
- **Allesina, S.**, Pascual, M. Quasi–Sign stability in large food webs. *The Ecological Society of America 91st Annual Meeting* - Aug. 7-12 2006, Memphis.
- **Allesina, S.** Evolving Democratic Food Webs. *University of Copenhagen* - Jun. 7 2006, Copenhagen, Denmark. *Invited*.

- **Allesina, S.** A random walk in food web stability. *University of Parma* - Jun. 5 2006, Parma, Italy.
- **Allesina, S.** Species Position in Food Webs. *Collegium Budapest, Institute for Advanced Study* - May 26 2006, Budapest, Hungary. *Invited.*
- **Allesina, S.** Structure and Function of Ecological Networks. *Chesapeake Biological Lab. - University of Maryland* - Nov. 28 2005, *Invited.*
- **Allesina, S.**, Bodini, A. Indirect connectance and scaling relations in food webs. *The Ecological Society of America 90th Annual Meeting* - Aug. 7-14 2005, Montreal, Canada.
- Peacor, S.D., **Allesina, S.**, Pascual, M., Riolo, R.L. Phenotypic-plasticity increases species coexistence by changing the steepness of an adaptive landscape. *The Ecological Society of America 90th Annual Meeting* - Aug 7-14 2005, Montreal, Canada.
- **Allesina, S.**, Bodini, A., Bondavalli, C. Secondary Extinctions in Ecological Networks: Bottlenecks Unveiled. *Fourth European Conference on Ecological Modelling* - Sept. 29 - Oct. 1 2004, Bled, Slovenia.
- Zickel, M.J., Ulanowicz, R.E., Allesina, S. Analyzing Fluid Flow Using Ecosystem Network Theory. *European Geosciences Union, 1st General Assembly.* - Apr. 24-30 2004, Nice, France.
- Allesina, S., Ulanowicz, R.E. Trophospecies, Trophic Roles and Diet Distances in Ecological Networks. *Peter Yodzis Colloquium* - Apr. 23-24 2004, University of Guelph, Canada.

Teaching

- Sept 2006
  Linear Algebra for Population Dynamics
  Seminar – Population Dynamics and Ecology (M. Pascual & A. Ostling, EEB 481)
  University of Michigan.
- June 2006
  A random walk in food web modeling
  Ecosystem Networks Modeling - Summer School
  University of Copenhagen, Denmark.
- June 2005
  A gentle introduction to food web modeling
  Ecosystem Modeling - Summer School
  University of Copenhagen, Denmark.
- Sept 2002 - Jan 2004
  IFOA (www.ifoa.it)
  IT Teacher (Programming, Office automation, Visual Basic)
- Oct 2001 - Jan 2004
  Cata1 s.r.l. (www.cata1.net)
  IT Teacher (C and Visual Basic programming, Office automation)

Service

Reviewer:

Biology Letters; Chaos; Ecological Complexity; Ecological Modelling; Ecology; Ecology Letters; Environmental Modelling & Assessment; Environmental Modelling & Software; Estuarine, Coastal and Shelf Science; Fisheries Research; Journal of Theoretical Biology; National Science Foundation; Nature; Oikos; Philosophical Transactions of the Royal Society Series B; Physics Letters A; PLoS Biology; Proceedings of the Royal Society Series B; The Quarterly Review of Biology.

Symposium Organizer:

"The Assembly and Disassembly of Ecological Networks: Restoration and Conservation at Multiple Trophic Levels".

Organizers: **Allesina, S.** and Pascual, M.
Ecological Society of America 92^{th} annual meeting. San Jose (CA) Aug 2007.

"Ecological Networks: Issues, advances and opportunities".
Organizers: Kazanci, C. and **Allesina, S.**
Society for Mathematical Biology Annual Meeting. San Jose (CA) Aug 2007.

Summer School Organizer:
"A primer in ecological networks: theory & data".
University of Parma June 15-20 2008. With Antonio Bodini, Giulio DeLeo & Cristina Bondavalli.

Grants, Awards, Membership

- 2008 - "The Spider and the Web: inference in ecological networks" $636,000
  NSF Grant EF-0827493 From 9/2008 to 9/2010. PIs: M. Pascual and S. Allesina.
- NCEAS postdoctoral associate (3 years funding)
- Italian Ministry of University - PhD Scholarship (3 years).
- International Society for Ecological Modeling young researcher bursary.
- Member of the Ecological Society of America (2005-)

Skills

- Languages: Italian (native speaker), proficient English.
- Computer Skills: C, C++, ObjectiveC, MS Visual Basic, Delphi & Pascal, SWARM Agent Based Modeling, Linux, Windows, SQL Server, Access, MySQL, R, LaTeX, Matlab.

Other Positions

- Sept 2001 - Oct 2004
  Freelance Software Developer
- Dec 2000 - Aug 2001
  FSI srl, Digitel Telephone Company
  Software Developer, Analyst, SQL Server Administrator

Stefano Allesina August 2008 Santa Barbara, CA