Low availability of code in ecology: call for urgent action

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Code is essential part of research

Enables:

- remembering one’s own analysis after a while
- others to understand and trust your work
- others to re-use the code and extend it

Scientific code:

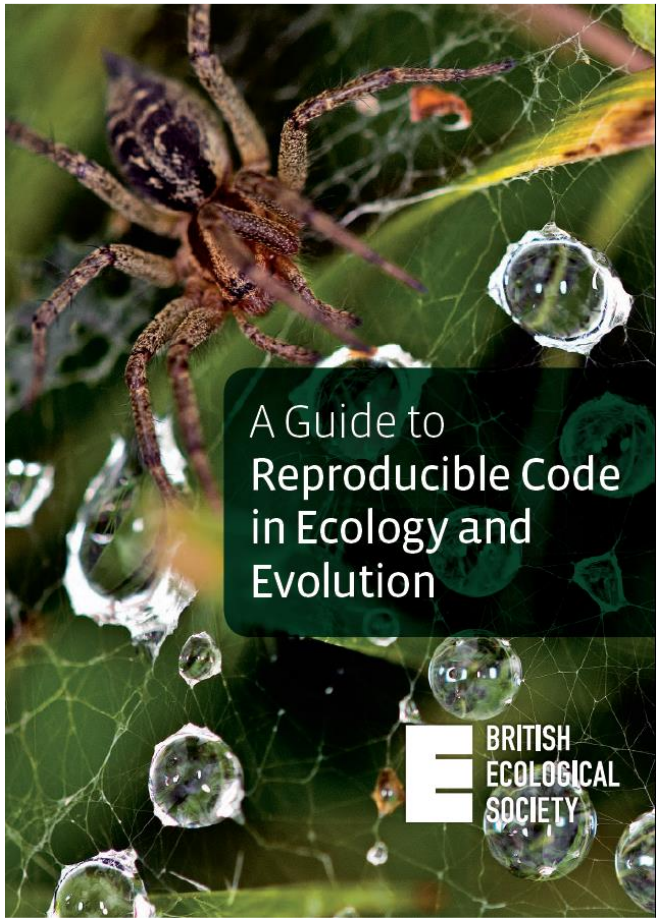
1) **Analysis code**

- used to simulate model results, conduct statistical analyses, (also to correct errors in data, create figures).
- *the majority of code written for ecological studies is analysis code*

2) **Scientific software**

- more general and is designed to be used in many different projects (e.g., R and Python packages).

There are existing guidelines for code in ecology/general



Good Enough Practices in Scientific Computing

Greg Wilson[1,‡*], Jennifer Bryan[2,‡], Karen Cranston[3,‡], Justin Kitzes[4,‡], Lex Nederbragt[5,‡], Tracy K. Teal[6,‡]

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2 University of British Columbia / jenny@stat.ubc.ca
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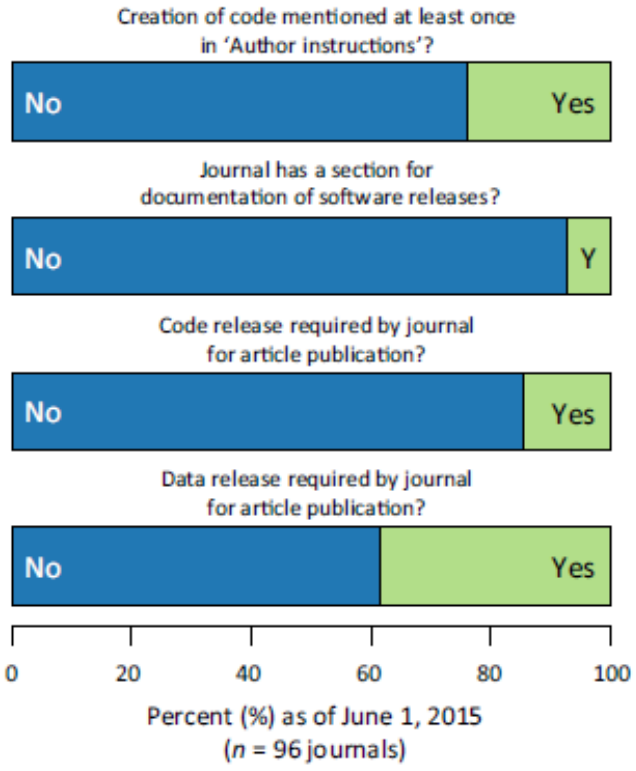
Code policies Ecology journals, as of June 2015

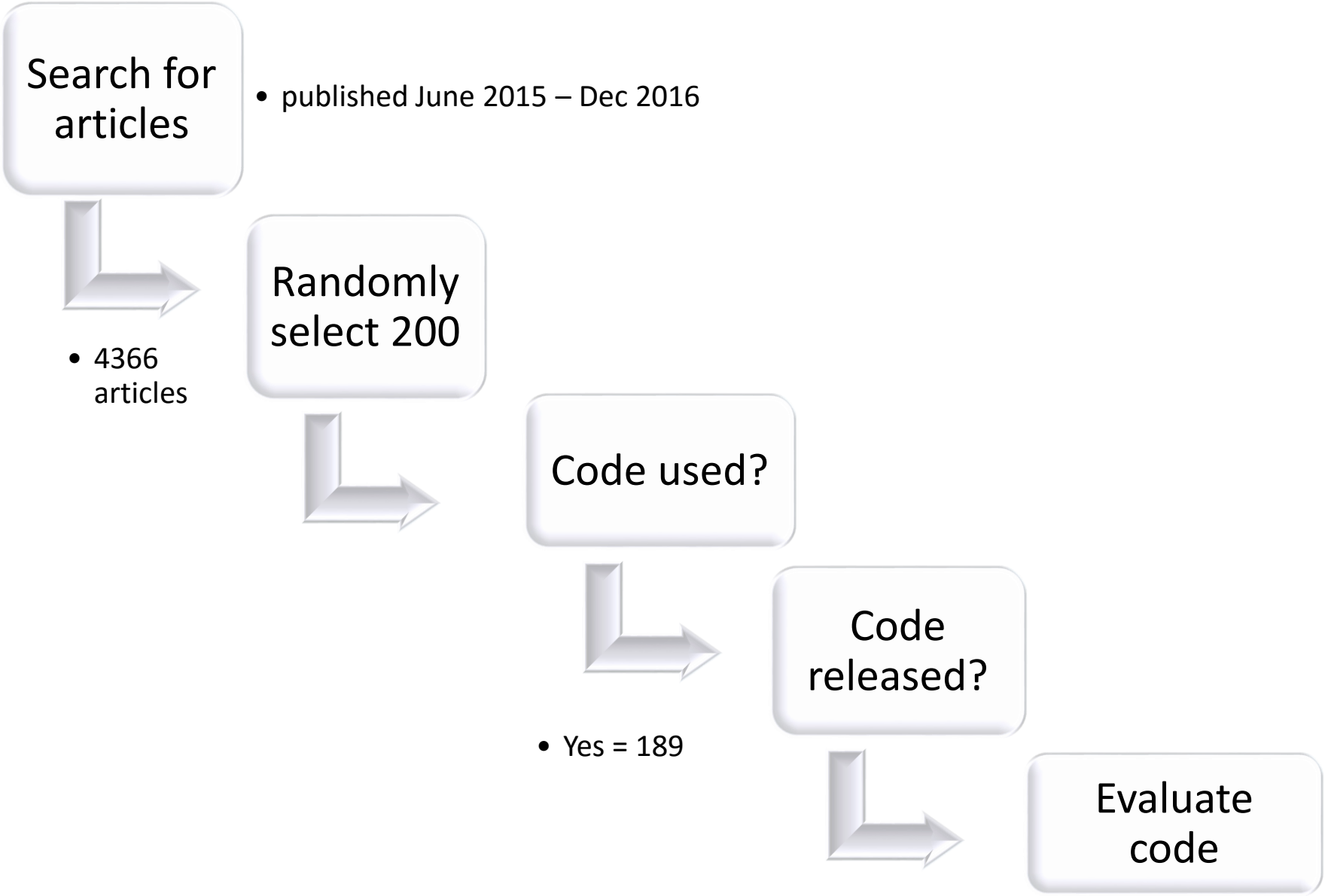
- More than 75% do not mention scientific code in the author guideline.
- Of the journals that mention scientific code, only 14% require code to be made available



from Mislan et al, 2016, Trends in Ecology and Evolution

What did we do?

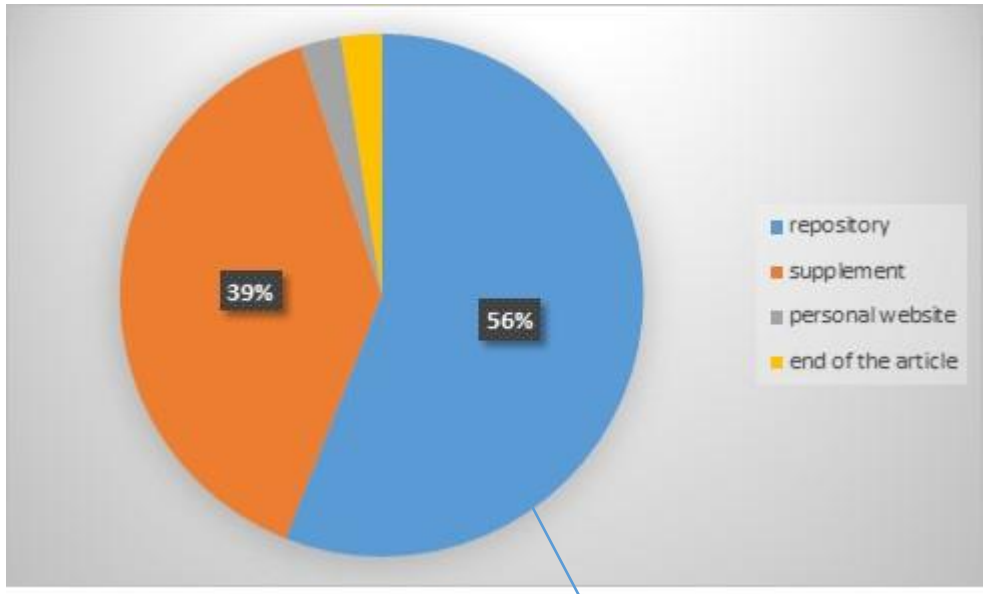
- Looked at code availability in 14 ecological journals with some kind of a code sharing policy / recommendation
- Looked at some aspects of the shared code (where shared, how referred to..)


Search for articles
published June 2015 – Dec 2016
4366 articles
Randomly select 200
Code used?
Yes = 189
Code released?
Evaluate code

How many papers that used code, released that code?

- <u>Only 14%! (36 out of 189 papers)</u>
- This is worrying, as these papers were published in Journals with a code policy (only 14 %of Ecology journals)

Where was code shared?

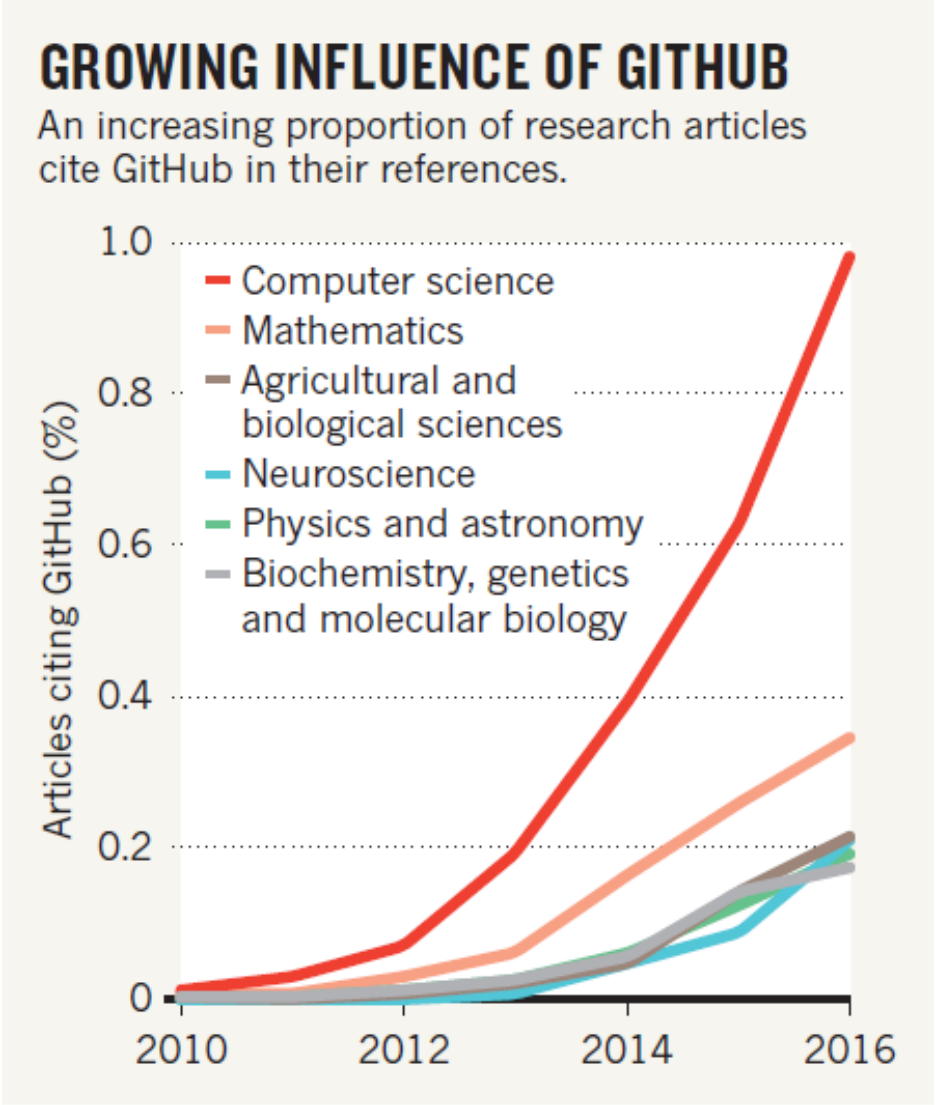


Of this:

- 50% Dryad
- 25% GitHub
- 15% Figshare

Means that:

- Only slightly more than 50% is accessible to all (repository, personal website)
- Long term availability (but not to everyone) for most of the code



As expected, Ecology is lagging behind

Perkel, 2016, Nature

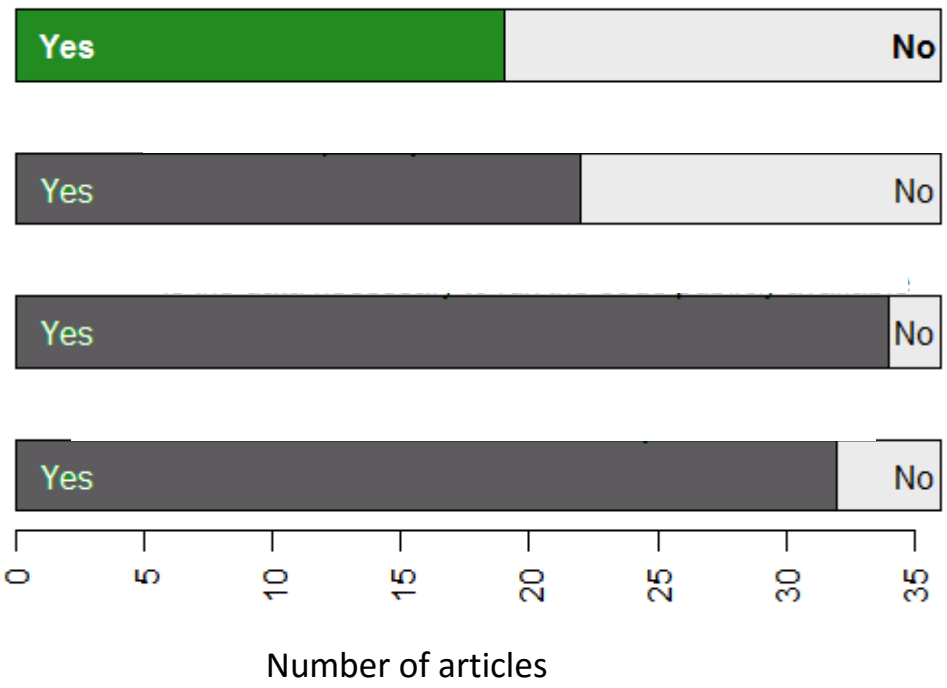
Full access to rerun the analysis:

For articles that shared code, is there a full access to rerun the code?

Is CODE shared vi repository/website?

Is the DATA shared?

Is the SOFTWARE a free source?



Is code easily discoverable from the article?

- 8 out of 36 articles do not explicitly mention that there is code available

- *discoverability of the code on its own (without knowing about the article)– not assessed*

Is code documented and easy to follow?

- Documentation is usually ok: 90% had some kind of documentation

✓ manual

✓ brief how to

✓inline comments

- Around 50% has inline comments – easy to follow

Main Conclusion

Publish your computer code: it is good enough

Freely provided working code — whatever its quality — improves programming and enables others to engage with your research, says **Nick Barnes**.

What next?

- We want to go back to the analysis, and repeat it for 2018

➢Has anything changed since?

Comments and suggestions welcomed!

Watch this space

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