

Is applied fisheries research like other science?

Authorship patterns in 30 years of DFO Research Documents



Sampling
(Assumed public domain image)

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Introduction

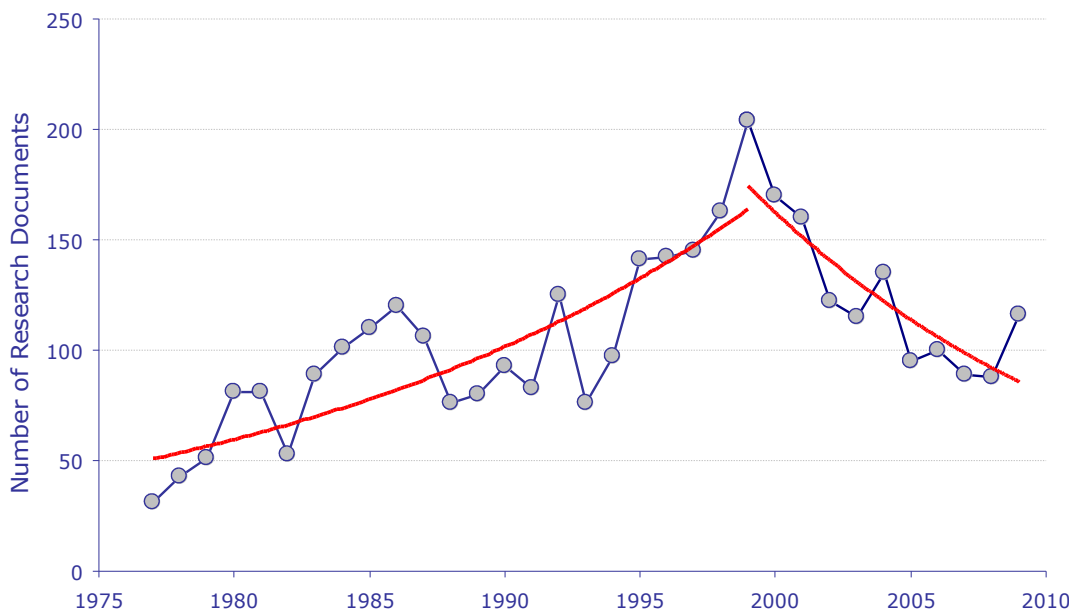
Patterns in scientific activity have been studied extensively, culminating in scientometrics as a distinct discipline. We introduce some empirical laws of scientometrics, based mainly on academic journals, and check them against the applied body of work produced by a fisheries agency.

The size of science (people, journals, papers) has doubled every 10-20 years for the last 300 years, at roughly twice the rate of population growth, so that over 85% of all scientists that ever worked are still active and the body of literature increases tenfold over the course of a professional career. About 25% of the researchers contribute 75% of the published materials, and more recent papers tend to have more authors spanning more specialties. (Price 1986, Rigler and Peters 1995)

Data: Research Documents by the Canadian Science Advisory Secretariat (CSAS) of DFO

- 3,481 Research Documents by 601 distinct First Authors published from 1977 to 2009
- Typically peer-reviewed by an advisory committee, plus 1 internal and 1 external reviewer. Recently added web-broadcasting to increase participation.
- Res. Docs differ from journal papers: often requested by management/policy, more detailed => more directly relevant to specific decisions faced by DFO
- Impressive body of work with three purposes: improved advice through debate, increased transparency, and organizational memory

Overall Trend in Production: Reports / Year



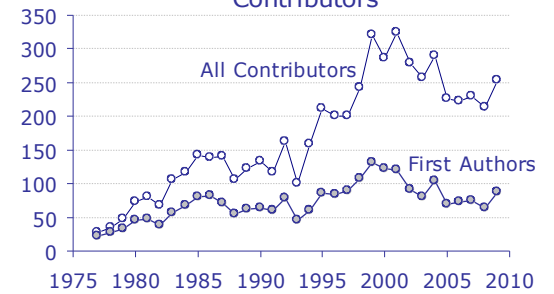
Hypotheses

Change in Number of contributing scientists?

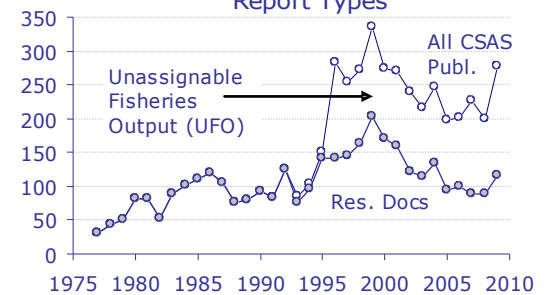
Shift to other publication type?

Change in scope?

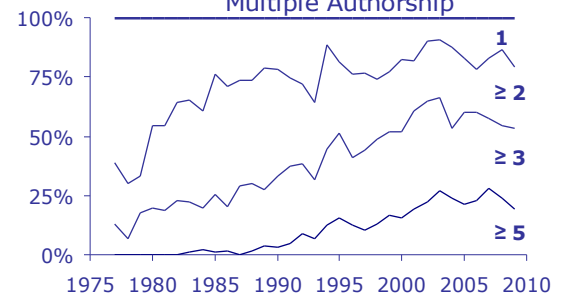
Contributors



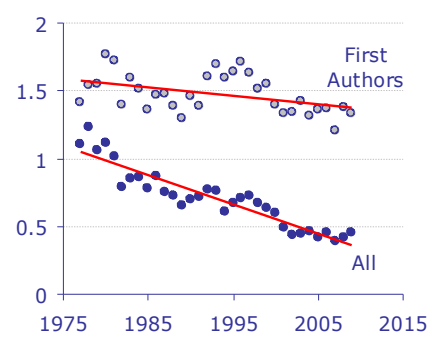
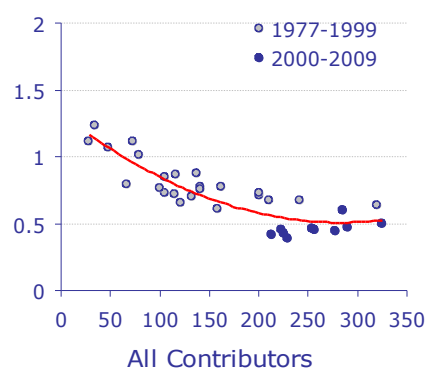
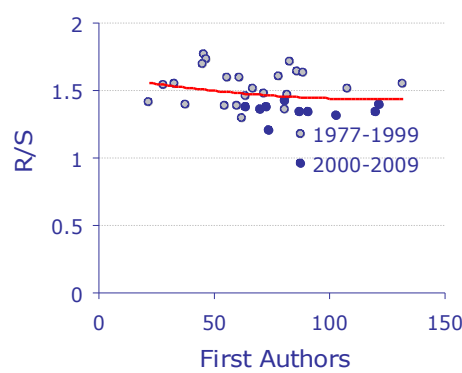
Report Types



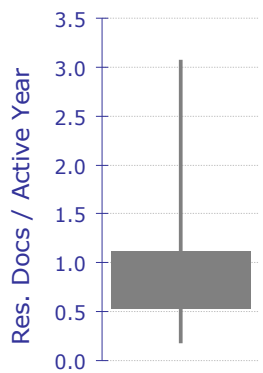
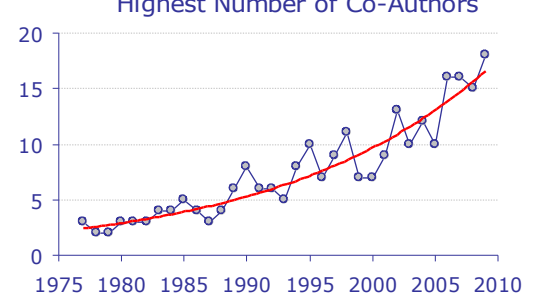
Multiple Authorship



Annual Productivity: Reports / Scientist (R/S)



Highest Number of Co-Authors

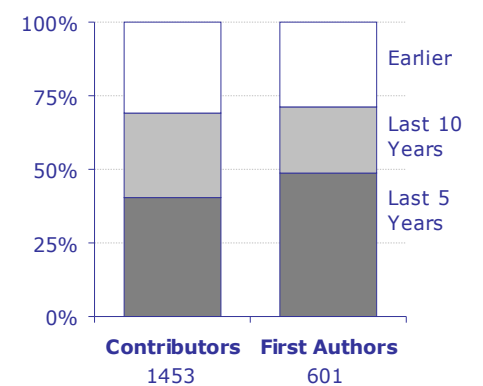


First Authors with 5 or more Res. Docs

Trivia

- 31 First Authors (5%) responsible for 870 Res. Docs (25%)
- 86 First Authors (29%) responsible for 1,740 Res. Docs (50%)
- Top Contributors:
 - 114 Res. Docs (75 as First Author) since 1981
 - 97 RD (44 FA) since 1979
 - 86 RD (29 FA) since 1983

Proportion of Authors with Recent Work



Questions Raised

Observed patterns in the authorship of CSAS Research Documents highlight a changing environment for applied fisheries research, with implications for both the resulting scientific advice and the professional paths of individual scientists. We will further explore the following questions:

- **Changes in scope** – Same pattern for other proxies? => track # of pages, develop qualitative scales of scope and complexity
- **Migration patterns** – Has publication effort shifted to other venues? => Track a subsample of individual authors (e.g. Journals, Commissions, ENGOS)
- **Broader dynamics** – Is CSAS typical of applied fisheries research? => expand the analysis to other agencies (e.g. ADF&G, WDF&W, NMFS, PSC)
- **Costs of increased collaboration** – Do density-dependent declines in productivity persist after accounting for increased scope?
- **Rise of the UFOs** – What are the short-term and long-term effects of increasing corporate authorship (i.e. unassignable fisheries output) ?

References

- CSAS (2010) *Publications Catalogue*. On-line at www.isdm-gdsi.gc.ca/csas-sccs/applications/publications/index-eng.asp
 Price, DJ de Solla (1986) *Little Science, Big Science ... and Beyond*. Columbia University Press, New York
 Rigler, FH and RH Peters (1995) *Science and Limnology*. Ecology Institute, Oldendorf, Germany