

1 **A data-based guide to the North American ecology faculty job market**

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Abstract

25 Every year for three years (2016 to 2018), I tried to identify every single person hired as a
26 tenure track prof in ecology or an allied field (e.g., fish & wildlife) in N. America. I identified a
27 total of 566 hires. I used public sources to compile various data on the new hires and the
28 institutions that hired them (e.g., number of publications, teaching experience, hiring institution
29 Carnegie class). I also compiled data provided by anonymous ecology faculty job seekers on
30 ecoevojobs.net (e.g., number of positions applied for, number of publications, numbers of
31 interviews and offers). And I polled readers of the Dynamic Ecology blog to get information
32 about applicant and search committee behavior (e.g., regarding customization of applications to
33 the hiring institution). These data address some widespread anxieties and misunderstandings
34 about the ecology faculty job market, and also speak to gender diversity and equity in recent
35 ecology faculty hiring. They complement, and in some cases improve on, other sources of
36 information, such as anecdotal personal experiences.

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Introduction

48 Academia is among the common career paths for Ph.D.-holding ecologists in North
49 America (Hampton and Labou 2017).¹ Some additional fraction of Ph.D.-holding ecologists
50 presumably seek a faculty position at some point.

51 Ecology faculty job seekers want information about the ecology faculty job market.
52 Indeed, there's a widespread perception that they already have it. That because academia was
53 traditionally seen as the "default" career path for ecology Ph.D.s, good information about that
54 career path is widely and easily available. But in fact, good systemic information either doesn't
55 exist, or exists only for fields that are unlike ecology in important ways. So all ecology faculty
56 job seekers have to go on are their own and others' anecdotal personal experiences, and advice
57 from others that itself is based on anecdotal experiences. Anecdotes, and advice based on them,
58 can be useful sources of information. But they also can be unrepresentative or otherwise
59 misleading, like any small and non-random sample. The competitiveness of the ecology faculty
60 job market combined with the lack of good systemic information creates a fertile breeding
61 ground for rumors and misplaced anxiety.

62 Both ecology faculty job holders and job seekers care about diversity and equity in
63 faculty hiring. Overt and subconscious discrimination, and systemic forces that shape individual
64 decision-making, can prevent the best people from applying, and can prevent the best people
65 from being hired if they apply. Further, academic departments, and the colleges and universities
66 comprised of them, are institutional wholes that are greater than the sum of their parts. Those
67 institutional wholes are best able to teach and inspire the full range of students who come
68 through their doors, and best able to pursue new knowledge, if they're comprised of diverse,

¹ Throughout, I restrict attention to North America. These results should not be assumed to generalize to other places.

69 complementary mixtures of people. However, the most oft-cited data on faculty diversity
70 concern the diversity of current faculty. Such data are informative about the ongoing legacy of
71 past inequitable hiring. But they are uninformative about diversity and equity in current hiring
72 because most current faculty were hired a decade or more ago. Available data on faculty
73 diversity also are aggregated into broad fields such as biology, and so are uninformative about
74 ecology specifically. We need data on recent faculty hiring in ecology to evaluate whether
75 current faculty hiring in ecology is diverse and equitable at a systemic level, and to focus
76 solutions on problems that exist in ecology rather than on problems specific to other fields.

77 Here I present a statistical profile of the North American ecology tenure-track faculty job
78 market. I provide systemic data on the available positions, hiring institutions, applicants, and
79 new hires.

80 **Data sources**

81 Data about positions and applicants came from ecoevojobs.net. It is a crowdsourced
82 spreadsheet which links to and summarizes advertised faculty positions in ecology and allied
83 fields. A new spreadsheet is produced annually for each “job year”, starting in the early summer
84 of the calendar year. The listing of tenure-track North American assistant professor positions in
85 ecology and allied fields is nearly comprehensive. Unless otherwise noted, all my data come
86 from the 2015-16, 2016-17, and 2017-18 spreadsheets. Ecoevojobs.net also allows anonymous
87 ecology faculty job seekers to publicly share information about themselves and the positions for
88 which they applied, including but not limited to year of Ph.D., current position, gender,
89 race/ethnicity, number of publications (first-authored and other), number of applications
90 submitted, number of interviews received (phone/skype and on campus), and number of offers
91 received.

92 To obtain data on new hires, each year from 2016 to 2018, in the summer and fall
93 following the end of the “job year”, I attempted to identify everyone hired into a North American
94 tenure-track assistant professor position in ecology or an allied field. Starting from the
95 ecoevojobs.net position list of tenure-track positions, I first culled any position that seemed
96 unlikely to be filled by an ecologist, based on the job title (e.g., genomics, cell biology, anatomy
97 & physiology). The retained positions were in areas such as ecology, fisheries, wildlife, natural
98 resources, forestry, conservation, botany, zoology, entomology, and biology. I also culled any
99 job that couldn’t be filled at the assistant professor level (e.g., ads for department chairs). Each
100 year, that left me with approximately 300 tenure-track assistant professor positions that could
101 potentially be filled by ecologists. I attempted to determine who, if anyone, was hired into those
102 jobs by looking at department websites, emailing colleagues and department chairs, posting
103 requests for information on the Dynamic Ecology blog and the Ecolog-L listserv, and searching
104 the web and social media. I included any spousal hires I was told about.

105 For every position I was able to identify, I recorded if it was filled by an ecologist at the
106 assistant professor level, filled in some other way (e.g., filled by a non-ecologist, filled at the
107 associate level), or not filled. Who to count as an “ecologist” (as opposed to, say, an evolutionary
108 biologist, taxonomist, or applied mathematician) is a judgment call. But the vast majority of
109 cases were clear-cut, and the results don’t change appreciably if the borderline cases are
110 discarded

111 I recorded each newly hired ecologist’s gender (man or woman), as judged from name,
112 photographs, and pronouns in social media profiles if available. A few new hires also
113 volunteered their gender, unasked for, in emails to me. Using a gender binary, and judging
114 gender from names and photographs, is an imperfect approach, but there was no alternative, and

115 the error rate should be low. I did not attempt to judge race/ethnicity, because that can't be
116 reliably determined from names and photographs.

117 I also compiled other various pieces of information about each new hire and the hiring
118 institution. For instance, in the final two years I recorded Carnegie class of US institutions, with
119 Canadian institutions being assigned to the most appropriate Carnegie class when that was clear
120 (e.g., the University of Toronto is the equivalent of an R1 institution). The precise additional
121 information recorded varied from year to year. Some information was compiled only for a subset
122 of new hires because it was time-consuming to compile or could not be determined for all hires.

123 One year, I read a sample of tenure-track ecology faculty job ads, recording information
124 about the job requirements.

125 Finally, I compiled information on number of applicants per position from
126 ecoevojobs.net, and by inviting readers of the Dynamic Ecology blog to anonymously share
127 firsthand knowledge. And I compiled information on applicant and search committee behavior
128 by polling readers of the Dynamic Ecology blog on their firsthand knowledge. These polls are
129 not random samples from any well-defined statistical population, but they comprise a usefully-
130 large set of anecdotes from a reasonably diverse set of people.

131 I present the results as a series of questions and answers. For the answer to each question,
132 I briefly summarize the data source and sample size. For links to the underlying data, deeper
133 analysis, and further discussion, see <https://dynamicecology.wordpress.com/ecology-faculty-job->
134 market-data/.

135

136 **What fraction of ecology faculty job seekers obtain TT faculty positions?**

137 *Data: Data on the post-Ph.D. career trajectories of thousands of ecologists, compiled by the US*
138 *National Science Foundation (NSF), analyzed by Hampton and Labou (2017), and further*
139 *analyzed by the author*

140 At least 1/3 of ecology faculty job seekers obtain TT faculty positions; the true fraction
141 may be appreciably higher than that. Hampton and Labou (2017) reported data from the NSF
142 Survey of Doctoral Recipients, a huge stratified random sample of doctoral recipients in all
143 scientific and engineering fields, including ecology. According to Hampton and Labou (2017),
144 4826 people got US PhDs in ecology from 2000-2011. As of 2013, 10.8% of those 4826 people
145 were postdocs, 3.5% were involuntarily unemployed, and 40.6% of the remainder were in
146 tenured or tenure-track faculty positions. That implies that 1/3 of US ecology Ph.D. recipients
147 from 2000-2011 were in tenured or tenure-track faculty positions as of 2013. The fraction who
148 eventually obtained TT faculty positions will be a bit higher than that, because some of those
149 Ph.D. recipients surely obtained TT faculty positions after 2013.

150 Further, some unknown fraction of Ph.D. recipients who did not obtain TT faculty
151 positions presumably never wanted or sought a TT faculty position. So the fraction of ecology
152 Ph.D. recipients who want TT faculty positions and go on to obtain them is even higher than 1/3.
153 This may seem surprisingly high, but it is consistent with other sources of information. As
154 discussed later in this paper, self-reported data from ecology faculty job seekers indicates that
155 >42% of them receive at least one TT job offer.

156 Widely quoted data from other sources indicate that a much smaller fraction of biology
157 Ph.D. recipients go on to TT faculty positions. But data for the field of biology as a whole are not
158 representative of ecology specifically. Many biology Ph.D.s are granted in biomedical and
159 biotechnological fields. Recipients of Ph.D.s in those fields often go on to private sector

160 employment, leaving a smaller fraction to go on to TT faculty positions. Annual rates of Ph.D.
161 production and TT faculty job openings also vary greatly among fields of biology.

162 The take home message here is not that the ecology faculty job market is uncompetitive.
163 It is competitive: TT ecology faculty job seekers outnumber ecology faculty jobs, and so a
164 substantial fraction of TT ecology faculty job seekers will never obtain a TT faculty position. But
165 the ecology faculty job market is not *as* competitive as one might think.

166

167 **How many ecology faculty job ads welcome or require applicants who collect their own
168 field data? How many welcome or require applicants with quantitative skills?**

169 *Data: 75 tenure-track ecology faculty job ads listed on ecoevojobs.net as of Sept. 6, 2017.*

170 Ecology faculty job ads vary widely in their job requirements. Contrary to some
171 anecdotal speculation on social media, most ecology faculty job ads continue to welcome or even
172 require applicants who collect their own field data, and only a small minority require advanced
173 quantitative skills beyond the typical training of North American Ph.D. holders in ecology. 64%
174 of ads welcomed, encouraged, or required applicants who collect their own field data. Only 40%
175 mentioned any quantitative skill, most commonly the ability to teach introductory undergraduate
176 biostatistics. Only 21% of ads mentioned or required “strong” quantitative skills, or specified
177 specific advanced quantitative skills such as Bayesian state space modeling.

178

179 **How many TT ecology faculty hires are there at different types of institution?**

180 *Data: 344 TT assistant professor positions in ecology and allied fields filled in 2016-17
181 and 2017-18.*

182 35% of TT ecology hires were at R1 universities (the most research-intensive Carnegie
183 category), 25% were at R2 or R3 universities, 24% were at M1-M3 universities (“master’s”
184 universities lacking substantial Ph.D. programs), 16% were at bachelor’s colleges (colleges
185 lacking substantial graduate programs), and one was at a tribal college. These data reflect
186 variation in the numbers of institutions in different Carnegie categories, and the fact that research
187 universities tend to employ more faculty than other institutions.

188

189 **How many applications does the typical TT faculty position in ecology receive?**

190 *Data: 86 TT positions filled from 2014-15 to 2017-18 (48 from anonymous information
191 on ecoevojobs.net, 38 from readers of Dynamic Ecology).*

192 Number of applicants per position varies widely: median 100 applicants, middle 50% 61-
193 175, range 12-1,000 (note that the position that received 1,000 applicants was a broad cluster
194 hire). Positions on the coasts (especially the Pacific Northwest), and at R1 universities, tend to
195 receive more applicants than others. Presumably at least in part for the same reasons why most
196 people live in coastal states, in the urban areas in which most R1 universities are located.
197 Fisheries/wildlife/natural resources positions tend to receive fewer applicants than others,
198 perhaps because Ph.D. holders in those fields often go to work for government agencies, NGOs,
199 or environmental consultancies, leaving fewer to pursue academic careers.

200

201 **How many positions does the typical TT ecology faculty job seeker apply to each year?**

202 **Does it vary by gender?**

203 *Data: 364 anonymous ecology faculty job seekers on ecoevojobs.net from 2009-10 to 2017-18.*

204 The typical ecology faculty job seeker applies to 10.5 TT faculty positions annually
205 (median; mean=15.8), but there is wide and highly skewed variation. Many job seekers reported
206 only a few applications annually, but a minority reported many (middle 50% 4-21.8 applications
207 annually, range 1-100).

208 Men and women ecology faculty job seekers reported submitting similar numbers of
209 applications annually (means of 17.1 for men, 16.8 for women).

210

211 **What types of positions do TT ecology faculty job seekers apply to?**

212 *Data: anonymous reports of 242 ecology faculty job seekers on ecoevojobs.net from 2015-16 to*
213 *2017-18.*

214 81% of ecology faculty job seekers said or implied that they applied to faculty positions
215 at research universities (e.g., by saying that they applied to “everything” or “broadly”), with 55%
216 explicitly saying they’d applied to R1 universities. In contrast, less than half said or implied that
217 they applied for faculty positions at bachelor’s colleges.

218 These data are consistent with the fact (discussed elsewhere in this piece) that faculty
219 positions at R1 universities tend to receive more applications than positions at other types of
220 institution. However, these data do not necessarily indicate a widespread preference among
221 ecology faculty job seekers for research-intensive careers, for two reasons. First, as noted
222 elsewhere in this piece, there are many more jobs at research universities than at bachelor’s
223 colleges. Second, there are many reasons why research university jobs might attract more
224 applicants. For instance, research universities tend to be concentrated in urban areas where many
225 job seekers might prefer to live for various reasons.

226

227 **How do ecology faculty job applicants typically customize their applications? How do**
228 **ecology faculty search committees expect them to be customized?**

229 *Data: survey of 102 current or former ecology faculty job seekers, and 35 recent ecology faculty*
230 *search committee members, on the Dynamic Ecology blog*

231 50% of ecology faculty job seekers tailored their applications to the hiring institution.

232 32% tailored their application to the hiring institution only when it was a job they really wanted.

233 17% tailored their applications to the *type* of institution, but not to individual hiring institutions.

234 Job seekers using all levels of customization reported receiving offers, with those doing less
235 customization reporting slightly more offers on average. I suspect that applicants who do less
236 customization of each application may apply to more positions and so receive more interviews
237 and offers. Applicants who do less customization may also be stronger applicants, and so not
238 need to do as much customization in order to get interviews and offers.

239 72% of search committee members preferred applications tailored to the hiring
240 institution, with many of those viewing such tailoring as an “honest signal” of the applicant’s
241 seriousness of interest in the position. That preference for applications tailored to the hiring
242 institution was appreciably more common, and was more likely to be seen as “essential”, among
243 search committee members at non-R1 institutions. Perhaps because smaller, less well-known
244 institutions have more reason to worry that applicants will not understand the job requirements or
245 the mission of the institution.

246 Drilling down, large majorities of ecology search committee members prefer applications
247 that respond to the specifics of the job ad, briefly mention how the applicant would use the
248 institution’s facilities, and describe how the applicant’s teaching and research would be tailored
249 to the institution’s students and mission. The latter is an especially desired form of customization

250 among search committee members at non-R1 institutions. About half of search committee
251 members also want applicants to read the course catalog and identify specific courses they could
252 teach or develop. Applicants most often report using the same forms of customization that search
253 committee members want to see. The exception was that a substantial minority of applicants
254 reported identifying specific faculty members at the hiring institution with whom they'd hope to
255 collaborate, a form of customization that only 17% of search committee members wanted to see.

256 The take-home messages here for applicants is that it's common, and worth your while,
257 to tailor your application at least to the type of hiring institution. Tailoring to the individual
258 institution might be warranted if it's a job you really want or it's a not a large research university
259 job. But don't waste time proposing collaborations with specific faculty. And if you feel you
260 need to make a choice between submitting fewer, more heavily customized applications or more,
261 less heavily customized applications, you should probably choose the latter (see below for data
262 demonstrating the importance of submitting many applications).

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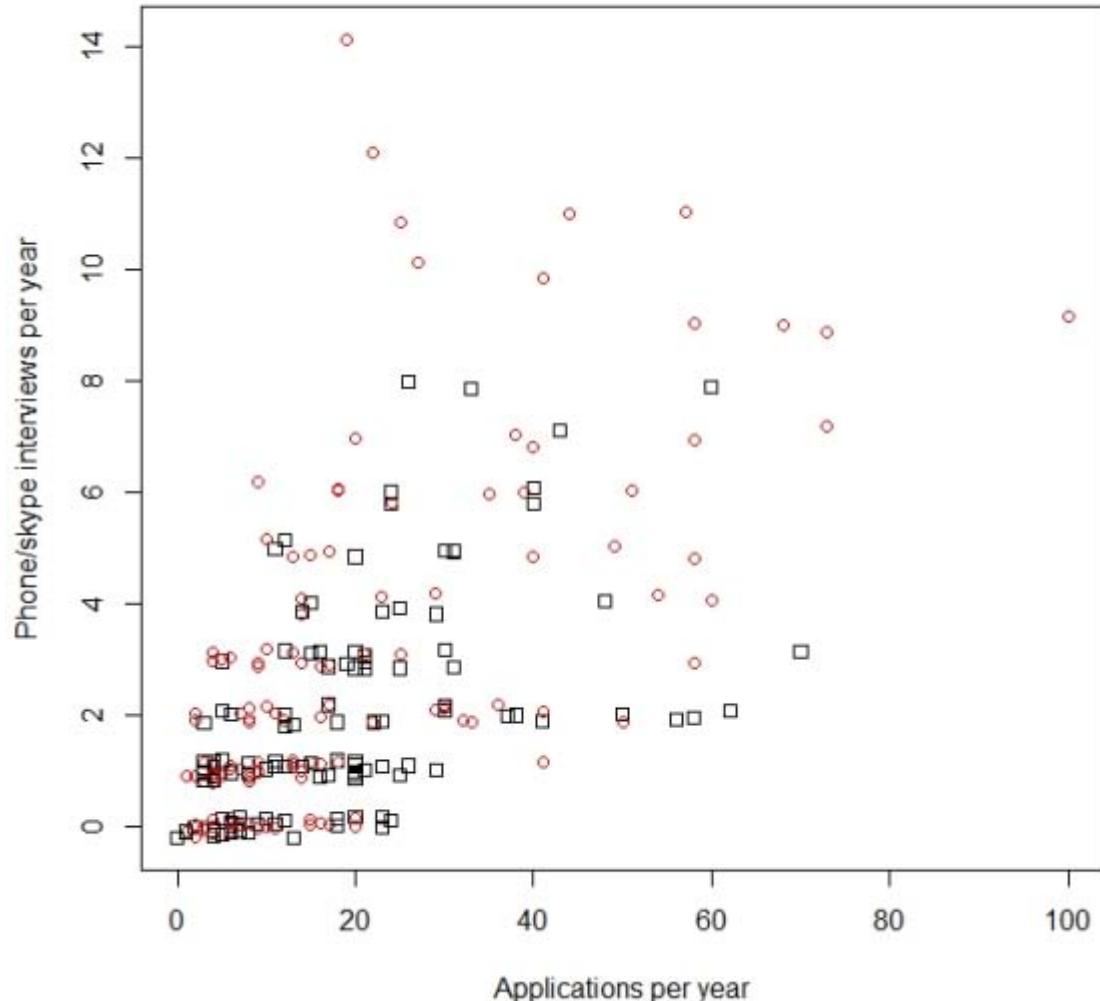
264 **How many interviews and offers can the typical TT ecology faculty job seeker expect to
265 receive in a given year? Are there any variables that predict the number of interviews and
266 offers a faculty job seeker will receive?**

267 *Data: 215 anonymous ecology faculty job seekers on ecoevojobs.net from 2009-10 to 2017-18.*

268 Ecology faculty job seekers typically report receiving 0-3 phone/skype interviews
269 annually, with those who submitted more applications reporting more phone/skype interviews on
270 average, and women reporting more phone/skype interviews than men on average (Fig. 1).
271 Women reported receiving a mean of 3.0 phone/skype interviews annually, vs. 2.0 for men
272 (medians were 2 and 1, respectively). Among applicants who reported 5 or more phone/skype

273 interviews in a single year, women outnumbered men 30 to 14. The increase in number of
274 interviews with number of applications appears to level off beyond ~30 applications/year,
275 presumably because applying for more positions than that often means applying for positions for
276 which you are a poor fit.

277 Note that these data likely slightly underestimate the frequency of job seekers receiving
278 no phone/skype interviews. A minority of job seekers did not report the number of interviews
279 they received, and non-reporters tended to be job seekers who applied to few positions and so
280 may have been unlikely to receive any interviews.



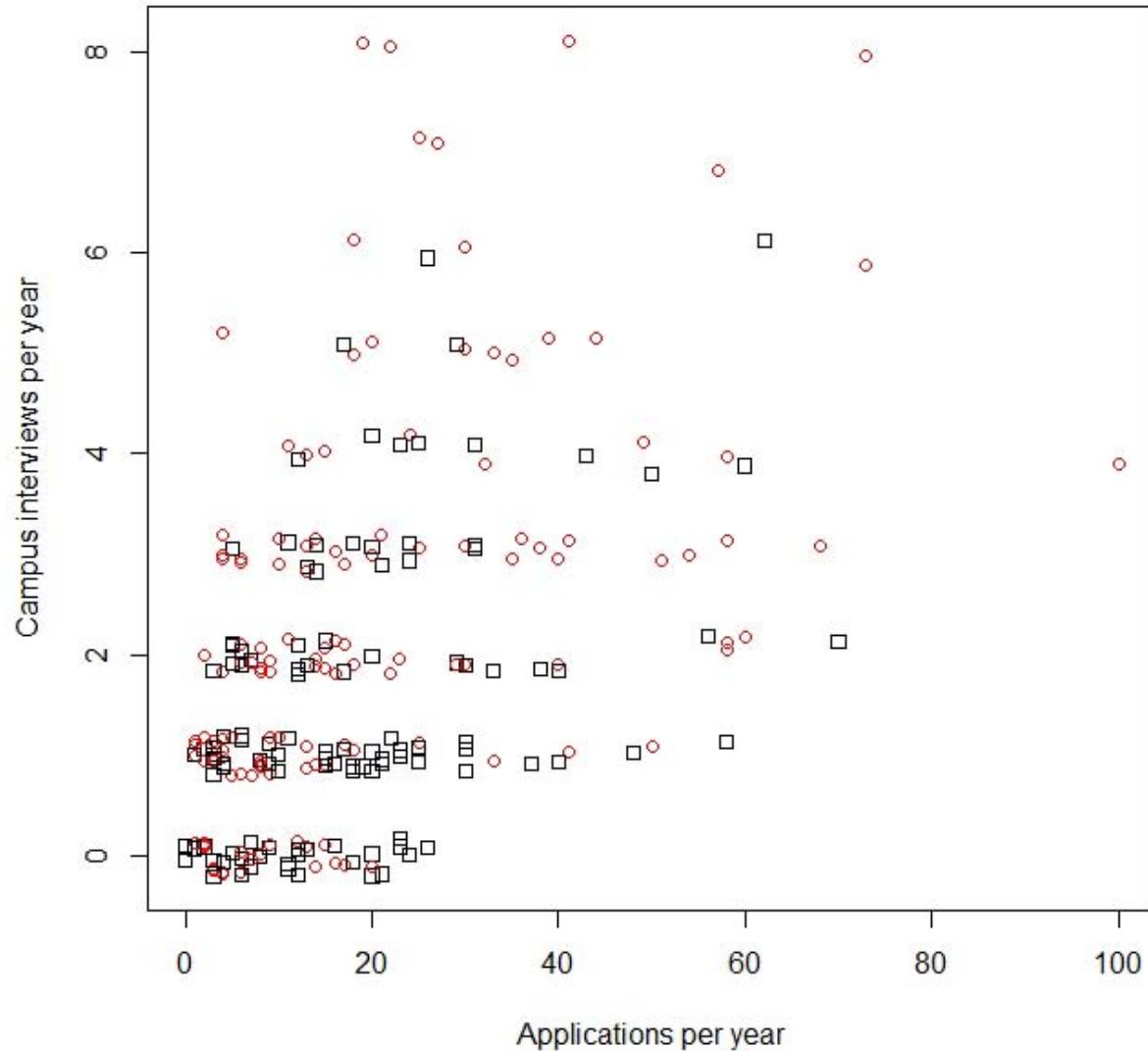
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282 **Figure 1.** Number of phone/skype interviews received annually by ecology faculty job seekers,
283 as a function of number of applications and gender. Each point gives data for one job seeker in
284 one year. Red circles denote women, black squares denote men. Points are slightly jittered for
285 visibility.

286

287 Data for number of campus interviews tell a similar story as the data for phone/skype interviews,
288 save that the relationship with number of applications is noisier because campus interviews are

289 rarer than phone/skype interviews (Fig. 2). Women reported receiving an average of 2.4 campus
290 interviews/year (median 2), men reported an average of 1.5 (median 1). 85% of women reported
291 receiving at least one campus interview in a given year, vs. 75% of men. Among applicants who
292 reported receiving at least four campus interviews in a given year, women outnumbered men 26
293 to 12. The relationship with number of applications again appeared to level off at ~30
294 applications. Note that, as with phone/skype interviews, these data may slightly underestimate
295 the frequency of job seekers receiving no campus interviews, due to non-reports.

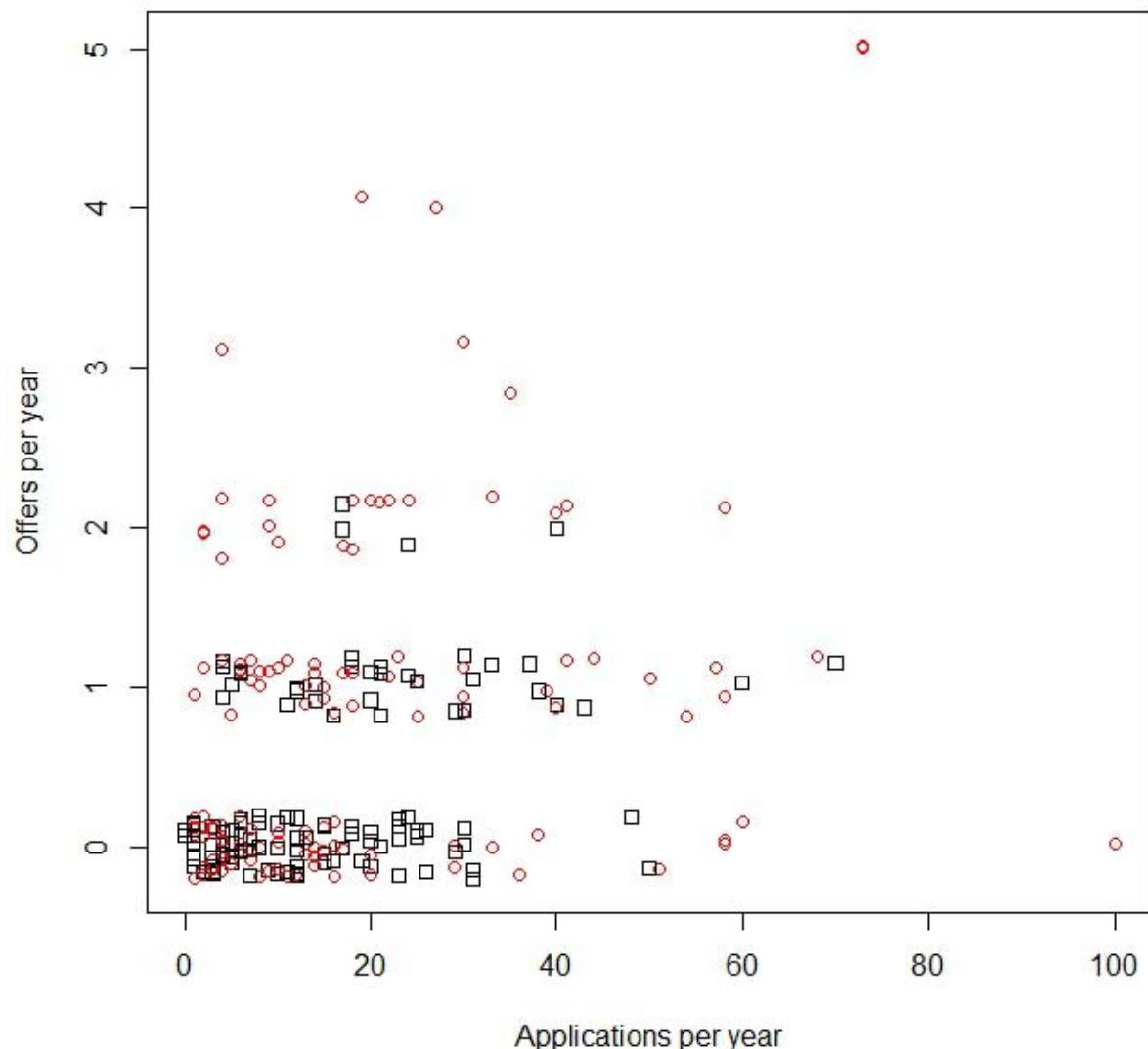


296

297 **Figure 2.** Number of campus interviews received annually by ecology faculty job seekers, as a
298 function of number of applications and gender. Each point gives data for one job seeker in one
299 year. Red circles denote women, black squares denote men. Points are slightly jittered for
300 visibility.

301

302 42% of ecology faculty job seekers reported receiving at least one faculty job offer in a
303 given year, and 12% reported receiving multiple offers, counting non-reports of offers as zeroes
304 (Fig. 3). An appreciably higher percentage of women than men reported receiving at least one
305 offer in a given year, and reported receiving multiple offers. The association between number of
306 applications and number of offers is positive but extremely noisy.



307

308 **Figure 3.** Number of TT offers interviews received annually by ecology faculty job seekers, as a
309 function of number of applications and gender. Each point gives data for one job seeker in one
310 year. Red circles denote women, black squares denote men. Points are slightly jittered for
311 visibility. Non-reports of offers were coded as zeroes.

312

313 The results line up with the fact (discussed next) that recently hired TT ecology faculty
314 are 57% women. They reflect the fact that, at a systemic level, most faculty search committees in
315 ecology now take diversity and equity seriously. They want to hire the best people, and the best
316 mix of people, to ensure that their departments and universities are places where all students and
317 faculty can flourish.

318 No other easily-measurable variables predict the number of interviews or offers ecology
319 faculty job seekers receive, not even if those variables are considered in combination. Variables
320 unrelated to number of interviews or offers include years of post-Ph.D. experience, number of
321 publications, number of first-authored publications, number of major grants received, and
322 number of classes taught.

323 The take-home lesson for faculty job seekers is that it is to your advantage to apply
324 widely. Although if you find yourself applying for more than ~30 faculty positions annually, you
325 may wish to consider if some of those applications are long

326

327 **What is the gender balance of recently hired TT assistant professors of ecology? Does it
328 vary among types of institution? Is it associated with any measurable gender differences in
329 qualifications? How does it compare to the gender balance of the applicant pool?**

330 *Data: Gender of 566 TT assistant professors of ecology hired from 2015-16 to 2017-18. Data on*
331 *institution type and qualifications was collected for those hired in 2016-17 and 2017-18. Also*
332 *self-reported gender of 401 anonymous ecology faculty job seekers on ecoevojobs.net from 2009-*
333 *10 to 2017-18.*

334 Recently hired TT assistant professors of ecology are 57% women. The 566 new hires on
335 which that number is based comprise a large sample of all TT assistant professors of ecology
336 hired in that period, but they're not a census. If we assume, plausibly, that 750 TT assistant
337 professors of ecology were hired in N. America during that time, then the two-tailed 95%
338 confidence interval ranges from 55-59% women (normal approximation to the binomial
339 distribution for a sample of 566 observations from a finite population of 750). The width of this
340 95% confidence interval does not widen by more than a percentage point in either direction for
341 any other plausible assumption about the true population size. It is possible that 57% might be a
342 slight underestimate because it proved more difficult to identify hires at small, teaching-intensive
343 institutions, and as shown below those institutions are more likely to hire women than are other
344 types of institution. However, this or any other possible sampling bias would have to be
345 implausibly large to shift the 57% estimate by more than a couple of percentage points in either
346 direction. The fact that this sample comprises a large fraction of all recently hired TT ecology
347 assistant professors leaves little scope for sampling biases to alter the results.

348 Breaking the gender balance down by year, new hires were 54% women in 2016-16, 59%
349 women in 2016-17, and 58% women in 2017-18. This means that the results are not driven by a
350 single unusual year. The modest year-to-year variation in the gender balance of ecology faculty
351 hires reflects the fact that I was able to identify an average of almost 190 new hires per year, a
352 reasonably large sample. It also reflects the fact that the factors shaping the gender balance of

353 new hires, such as the gender balance of the applicant pool, don't change much from one year to
354 the next.

355 The gender balance of recently hired TT ecology faculty covaries with research
356 intensiveness of the hiring institution, although the effect size is modest. Over the three years
357 from 2015-16 to 2017-18, new hires were 54% women at R1 universities or their Canadian
358 equivalents, and 59% women at other types of institution. From 2016-17 to 2017-18 (the only
359 years over which I compiled full Carnegie classification data for all hiring institutions, rather
360 than just R1 vs. non-R1), new hires were 55% women at Ph.D.-granting research universities
361 (i.e. R1, R2, and R3 institutions), with no obvious difference between R1 vs. R2-3, and 63%
362 women elsewhere. These results echo data from other fields. In almost all scholarly fields,
363 women comprise a higher proportion of faculty at more teaching-intensive institutions. They also
364 echo the fact that women comprise a high percentage of school teachers in all OECD countries.
365 Because these trends are not ecology-specific, the reasons for them seem unlikely to be ecology-
366 specific.

367 Recently hired men and women TT ecology faculty were equally experienced on average.
368 For instance, in 2017-18, the median Ph.D. year for newly hired ecology faculty was 2014 for
369 both men and women, and the means differed by only five months (mean Ph.D. year 2013.4 for
370 men, 2013.8 for women). Recently hired women and men differed a bit on average in some
371 measurable indices of research productivity, such as h-index, but these differences mostly
372 vanished after controlling for the research intensiveness of the hiring institution. Combining data
373 from 2016-17 and 2017-18, men and women hired at bachelor's colleges had mean Google
374 Scholar h-indices at the time of hiring of 6.9 and 6.6, respectively. At master's institutions
375 (Carnegie categories M1-M3), the means were 7.7 for men and 6.7 for women. At research

376 universities (Carnegie categories R1-R3), the means were 10.3 for men and 9.4 for women. The
377 remaining small differences in mean h-index have many potential explanations having nothing to
378 do with how well-qualified recent hires are.

379 Recent TT ecology faculty hires are 57% women even though the applicant pool is a bit
380 short of gender parity. US ecology postdocs were 46% women as of 2013 (Hampton and Labou
381 2017). And anonymous ecology faculty job seekers on ecoevojobs.net were 47% women over
382 the last decade.

383 My interpretation of these data is that these days in ecology, multiple excellent women
384 and men apply for most N. American TT faculty positions (a state of affairs that of course
385 reflects everything that shapes people's career choices and outcomes at the pre-faculty stages).
386 So search committees for most ecology faculty positions will have the opportunity to choose
387 between strong men and women candidates. To help them choose well, search committees these
388 days get trained about bias, diversity, and equity, and have to obey HR rules designed to ensure
389 fairness (e.g., rules obliging search committees to ask all candidates the same questions in the
390 same order during interviews). And many search committees these days are keen for their
391 departments to become more diverse on various dimensions, including but by no means limited
392 to gender. Which is a good thing for them to want. After all, individual faculty don't exist in
393 isolation from one another. Departments, and the colleges and universities comprised of them,
394 are institutional wholes that are greater than the sum of their parts. Those institutional wholes are
395 best able to teach and inspire the full range of students who come through their doors, and best
396 able to pursue new knowledge, if they're comprised of diverse, complementary mixtures of
397 people. So gender and other personal attributes are among the many things that search
398 committees consider when they get down to making difficult judgment calls about whom to hire

399 from among (typically) 3-5 well-qualified candidates, each of whom would be an asset to the
400 hiring department in their own unique way (i.e. there's often not a single "best" candidate on all
401 dimensions). The net outcome is that, at an aggregate statistical level, the proportion of women
402 among recently-hired TT N. American ecology faculty ends up being modestly higher than the
403 proportion of women in the applicant pool, without any appreciable differences in average on-
404 paper qualifications between men and women recently hired at the same type of institution. This
405 is good news, and represents important systemic progress that ecologists should seek to maintain
406 and build upon in order to create a climate in which all ecologists can flourish.

407

408 **Where did recent hired ecology professors get their bachelor's degrees? Did most get their
409 bachelor's degrees from "top" institutions? Do bachelor's colleges tend to hire people with
410 bachelor's degrees from bachelor's colleges?**

411 *Data: 75 TT assistant professors in ecology and allied fields hired in 2017-18. Those 75 people
412 include all 23 identified hires at bachelor's colleges that year, plus 52 randomly-chosen hires at
413 other types of institution.*

414 Those 75 recent hires got their bachelor's degrees from 66 different institutions. Only 6
415 of 75 got bachelor's degrees from liberal arts colleges or national universities ranked in the 2019
416 US News and World Report top 30 (a crude proxy for "top" institutions). 84% got their
417 bachelor's degrees in the US. The remainder received bachelor's degrees from one of eight other
418 countries. My interpretation of these results is that there good undergraduate students
419 everywhere, some of whom go on to become academic ecologists.

420 Contrary to what you may have heard, bachelor's colleges showed no strong tendency to
421 hire graduates of bachelor's colleges. Only 7/23 bachelor's college hires received their

422 bachelor's degrees from bachelor's colleges. As discussed below, bachelor's colleges do indeed
423 want to hire faculty who understand their students and their unique institutional missions—but
424 they don't do that by hiring graduates of bachelor's colleges.

425

426 **Where did recently hired ecology professors get their Ph.D.s? Did most get their Ph.D.s
427 from “top” institutions? Do “top” institutions tend to hire people with Ph.D.s from “top”
428 institutions?**

429 *Data: 321 TT assistant professors in ecology and allied fields hired in 2016-17 or 2017-18.*

430 Recently hired ecology professors got their Ph.D.s from a wide range of places: 147
431 different institutions. No single institution granted more than 3% of the Ph.D.s held by recently
432 hired TT N. American assistant professors of ecology. The diversity of institutions from which
433 recently hired TT ecology faculty received their Ph.D.s is comparable to the tropical tree species
434 diversity on Barro Colorado Island in Panama, as measured by Simpson's index. This makes
435 ecology very different from the fields of computer science, business, and history, in which the
436 top 10 US Ph.D. programs train >70% of all US TT faculty (Clauset et al. 2015).

437 86% of recent ecology faculty hires received Ph.D.s from US institutions, 8% from
438 Canadian institutions, the rest received their Ph.D.s from one of ten other countries. Presumably,
439 the rarity of hires with Ph.D.s from outside North America primarily reflects the rarity of
440 applicants from outside North America.

441 In contrast to the fields of computer science, business, and history (Clauset et al. 2015),
442 highly ranked ecology programs show no obvious tendency to only hire graduates of other highly
443 ranked programs. This is good news, and presumably reflects the fact that faculty search
444 committees have many lines of evidence with which to evaluate applicants—cv's, publications,

445 research and teaching statements, reference letters, etc. They don't need to rely on graduate
446 program reputation as a crude proxy to evaluate applicants.

447

448 **Do you have to have a paper in Science, Nature, or PNAS to be hired as a TT ecologist?**

449 **Does the answer depend on whether you're seeking a position at an R1 university?**

450 *Data: 314 TT assistant professors of ecology hired in 2016-17 or 2017-18.*

451 Only 25% of recently hired TT ecology professors had papers in Science, Nature, or
452 PNAS at the time they were hired, and only 12% had first-authored papers in those journals.
453 Even at the most research-intensive institutions, papers in those journals are far from essential to
454 be hired into a TT ecology faculty position. Among recent hires at R1 institutions or their
455 Canadian equivalents, 45% had Science, Nature, or PNAS papers at the time of hiring, and 27%
456 had first-authored papers in those journals.

457

458 **Do you have to have a famous Ph.D. supervisor to be hired as a TT ecologist at a research-
459 intensive institution?**

460 *Data: Attributes of the Ph.D. supervisors of 39 TT assistant professors of ecology hired at R1
461 universities in 2017-18, and 20 TT assistant professors of ecology hired at bachelor's colleges in
462 2017-18.*

463 Online discussions of the ecology faculty job market occasionally suggest that having had
464 a famous Ph.D. supervisor is common or even essential among recent faculty hires at R1
465 universities. This is incorrect, for any plausible operational definition of "famous". The Google
466 Scholar h-indices of the Ph.D. supervisors of recently hired TT ecology faculty at R1 universities
467 vary widely (median 47, range 7-153), do not differ appreciably from the h-indices of the

468 supervisors of recent hires at bachelor's colleges (median 44, range 29-77), and resemble the h-
469 indices of a representative sample of tenured R1 university ecology professors. That is, these
470 data look more or less as would be expected if recently-hired ecology faculty at all types of
471 institutions had done their Ph.D.s with a random sample of tenured ecology faculty at research
472 universities.

473 Other operational definitions of “famous” lead to the same conclusion. For instance, only
474 7% of R1 hires, and no bachelor's college hires, were supervised or co-supervised by a member
475 of the US National Academy of Sciences.

476

477 **How many years of post-Ph.D. experience did recently hired TT ecology professors
478 typically have? How does that compare to the experience level of the applicant pool?**

479 *Data: 306 TT assistant professors of ecology hired in 2016-17 or 2017-18. For purposes of
480 calculating years post-Ph.D., those hired in 2016-17 were coded as 2017 hires; those hired in
481 2017-18 were coded as 2018 hires. Also 441 anonymous ecology faculty job seekers on
482 ecoevojobs.net from 2009-10 to 2017-18.*

483 Recently hired TT assistant professors of ecology typically were about 4 years post-Ph.D.
484 at the time of hiring (mean 4.2 years, median 4). 69% had anywhere from 2-6 years of post-Ph.D.
485 experience, with a range from 0-11 years of post-Ph.D. experience. The majority of ecology
486 faculty job seekers also are 2-6 years post-Ph.D.

487 These data are consistent with a job market in which most hiring institutions prefer
488 applicants with at least a year or two of post-Ph.D. experience. But once you have a few years of
489 post-Ph.D. experience, the marginal value of additional post-Ph.D. experience appears to be low
490 at best.

491

492 **How were recently hired TT ecology professors employed at the time of hiring?**

493 *Data: 144 TT assistant professors of ecology hired in 2017-18.*

494 65% of recently hired ecology faculty were postdocs at the time of hiring. 13% were TT
495 or (much more rarely) tenured professors at another institution. 8% were in a non-tenured
496 research-focused position such as “research professor” or “scientist”. 4% were in a non-tenured
497 teaching-focused position such as “teaching fellow” or “instructor”. 3% were visiting assistant
498 professors. The remainder were in other employment, though two of those were also adjunct
499 professors.

500 One take-home message here for faculty job seekers is that TT faculty positions rarely are
501 filled by people in non-academic employment. You can’t leave academia and expect to return
502 later. Another take-home message for faculty job seekers is not to worry too much about
503 competition from candidates who already hold tenured or TT positions elsewhere. In my
504 experience, applicants who already hold tenured or TT positions comprise only a small fraction
505 of all applicants, are judged according to higher standards than more junior applicants, are more
506 expensive to hire, and are less likely to accept any offer they might receive. For all these reasons,
507 the TT faculty job market in ecology is not dominated by existing TT faculty playing “musical
508 chairs.”

509 Another take-home message for faculty job seekers is that it’s actually not common for
510 TT faculty to have previously served as visiting assistant professors or in some other exclusively
511 teaching-focused non-TT position. As a faculty job seeker, don’t assume that you “have” to take
512 a full-time non-TT teaching position in order to eventually land a TT faculty position, not even a
513 TT position at a teaching-intensive institution. Teaching-intensive institutions do indeed expect

514 their TT faculty to have substantial teaching experience (see below). But most recently hired
515 ecologists acquired that experience in some other way besides taking full-time non-TT teaching
516 positions.

517

518 **What teaching experience did recently hired TT assistant professors of ecology have?**

519 *Data: 29 TT assistant professors of ecology hired at R1 universities in 2017-18, and 16 TT
520 assistant professors of ecology hired at bachelor's colleges in 2017-18.*

521 Almost all recently-hired TT ecology professors had some form of teaching experience
522 and/or pedagogical training. Only two R1 university hires listed no teaching experience or
523 pedagogical training on their cv's. However, I suspect that even they likely served as teaching
524 assistants. 23/29 R1 hires and 12/16 bachelor's college hires listed teaching assistant experience
525 on their curriculum vitae, and I suspect that most or all of the others had it but didn't bother to
526 list it.

527 Experience as an instructor of record is almost essential to be hired for a TT faculty
528 position at the most teaching-intensive institutions. 14 of 16 recent hires at bachelor's colleges
529 served as instructors of record before being hired, often for multiple courses. Of the other two,
530 one served as a co-instructor. The other designed and taught a course for high school students, an
531 unusual but substantial form of teaching experience. Experience as an instructor of record was
532 rarer but far from unheard of among recent R1 university hires: 12/29 had it.

533 Guest lecturing is a common form of teaching experience among R1 hires; 16/29 listed
534 guest lecturing on their cv's. Only 4/16 bachelor's college hires did so, perhaps because
535 experience as an instructor of record makes guest lecturing experience redundant.

536 Guest lecturing and teaching assistant experience are the most common forms of teaching
537 experience among R1 hires. But only 9/29 R1 hires had teaching experience limited to teaching
538 assistantships and/or guest lecturing.

539 Only 3/16 bachelor's college hires and 4/29 R1 hires listed any formal pedagogical
540 training on their cv's.

541 Based on these data, I would strongly advise faculty job seekers to obtain experience as
542 an instructor of record if they plan to seek a teaching-intensive faculty position, and not to bother
543 applying for teaching-intensive faculty positions unless they have that experience or equivalent
544 experience. However, faculty job seekers seeking TT faculty positions at research universities
545 should carefully consider whether serving as an instructor of record would take too much time
546 away from research, relative to the benefit to their pedagogical skills and job prospects.

547 Attending pedagogical training workshops and short courses might be a less time-intensive way
548 to acquire some teaching skills and signal to future employers that you take teaching seriously.

549

550 **Are many TT ecology faculty positions filled by “inside” candidates?**

551 *Data: 35-326 TT assistant professors of ecology hired in 2016-17 and 2017-18.*

552 A common worry among faculty job seekers who comment on ecoevojobs.net is that they
553 will lose out to “inside” candidates whose current or past connections to the hiring department
554 will work in their favor, even if they are not the best candidates. Faculty job seekers who have
555 this worry may wish to consider that they're worrying about a very unlikely possibility. Very few
556 TT assistant professor positions in ecology and allied fields are filled by a candidate with any
557 current or previous connection to the hiring department:

558 • 3% of new hires got a bachelor's degree from the hiring institution (sample size: 77 new
559 hires in 2017-18)

560 • 0.3% of new hires got a Ph.D. from the hiring institution (sample size: 307 new hires in
561 2016-17 and 2017-18)

562 • 4% of new hires were employed by the hiring institution at the time of hiring (sample
563 size: 326 new hires in 2016-17 and 2017-18)

564 • No new hires were employed by the hiring institution sometime after obtaining their
565 Ph.D.s, but not employed by the hiring institution at the time of hiring (sample size: ~150
566 new hires in 2017-18)

567 • No new hires lacking a previous educational or employment connection to the hiring
568 institution had ever co-authored a paper with someone in the hiring department (sample
569 size: 35 new hires in 2017-18).

570 These data indicate that faculty job seekers rarely obtain a TT faculty position by first
571 developing an educational or professional connection with the hiring department. This is
572 consistent with my own experience. My own experience is that it is extremely rare for TT faculty
573 positions to be intended for a specific “inside” candidate from the get-go. For other faculty
574 positions, “inside” candidates are a small fraction of all applicants at most, and are evaluated on
575 a level playing field with the other applicants.

576

577 **What is the typical Google Scholar h-index of recently hired TT assistant professors of
578 ecology?**

579 *Data: Google Scholar h-indices of 264 TT assistant professors of ecology hired in 2016-17 or
580 2017-18.*

581 The Google Scholar h-index is a crude summary measure of publication productivity and
582 the frequency with which those publications are cited. It has numerous flaws and limitations, for
583 instance weighting co-authored publications the same as sole- or first-authored publications. And
584 it is not used by ecology faculty search committees to evaluate applicants, as far as I am aware.
585 But it may be loosely correlated with attributes that search committees do consider, and it might
586 be useful to prospective faculty job seekers to know if their own h-indices fall within the typical
587 range for new hires. Looking at h-index data also is a convenient way to test the widespread
588 impression that you have to have many publications in order to be competitive for a TT faculty
589 position in ecology. Your h-index cannot exceed your number of publications.

590 Recently hired TT assistant professors of ecology typically have an h-index of 8 (median;
591 mean=8.7), but the values range widely. The middle 50% of the distribution ranges from 6-11,
592 and the full range is 1-24. Some of this variation reflects the fact that h-indices run higher on
593 average among new hires at Ph.D.-granting research universities compared to new hires at other
594 institutions (though the distributions do overlap). But h-indices often vary by a factor of two
595 even among new hires of similar experience levels who were hired into the same department.

596 Note that the wide spread of h-indices does not primarily reflect variation among recent
597 hires in years of post-Ph.D. experience. H-index is only loosely positively correlated with years
598 of post-Ph.D. experience among these 264 recent hires.

599 Note as well that not all new hires have Google Scholar pages, and those who don't are
600 concentrated at less research-intensive institutions. For that reason, these data likely slightly
601 overestimate the typical h-index of recently hired TT assistant professors of ecology.
602

603 **How many first-authored publications do you need to have to be hired as a TT ecologist at**
604 **an R1 university? How many of those first-authored publications need to be in “leading”**
605 **journals? How do the first-authored publication counts of recent hires at R1 universities**
606 **compare to those of the applicant pool? Do first-authored publication counts of applicants**
607 **vary by gender?**

608 *Data: First-authored peer-reviewed paper counts of 39 TT assistant professors of ecology hired*
609 *at R1 universities or their Canadian equivalents in 2017-18. “Leading” journals were*
610 *operationally defined as those with a 2-year impact factor ≥ 3 , regardless of the journal’s field.*
611 *Book chapters, government technical reports, book reviews, letters to the editor, comments, etc.,*
612 *were not counted. Also first-authored publication counts of 442 anonymous ecology faculty job*
613 *seekers on ecoevojobs.net from 2009-10 to 2017-18.*

614

615 Ecology faculty search committees at research universities don’t base their hiring
616 decisions on crude quantitative metrics like publication counts. But they do want to hire faculty
617 who will lead high quality, high impact research programs. One line of evidence for the ability to
618 do that is the applicant’s record of first-authored publications. Publication count data are time-
619 consuming to compile, so I compiled them only for recent hires at R1 universities. These counts
620 should provide an upper bound on the publication counts of ecologists hired at less research-
621 intensive institutions.

622 Recently hired TT assistant professors of ecology at R1 universities varied widely in how
623 many first-authored papers they’d published at the time of hiring, and how many of those first-
624 authored papers were in “leading” journals. The typical recent R1 hire had 7 first-authored
625 papers (median; mean=9.5), with a wide spread around the typical value (middle 50% =5-11,

626 range=3-38). The typical recent R1 hire had 4 first-authored papers in leading journals (median;
627 mean 4.4), again with a wide spread around the typical value (middle 50% 2-6, range 0-14). No,
628 that last range is not a typographical error. There were actually multiple ecology faculty hired
629 into TT assistant professor positions at R1 universities in 2017-18 with no first-authored papers
630 in journals with two-year impact factors ≥ 3 .

631 Note that this wide spread does not primarily reflect variation among recent R1 hires in
632 years of post-Ph.D. experience. Counts of first-authored publications, and first-authored
633 publications in leading journals, were only loosely positively correlated with years of post-Ph.D.
634 experience among these 39 recent R1 hires.

635 Part of the explanation for why some recent hires had few or no first-authored papers in
636 “leading” journals is because some work in specialized subfields in which there are few or no
637 journals with two-year impact factors ≥ 3 (e.g., ecological entomology, fisheries). However, that
638 is only part of the explanation; some recent hires with < 2 first-authored publications in “leading”
639 journals were hired into faculty positions in “ecology” or broad subfields.

640 The first-authored publication counts of ecology faculty job seekers as a group are similar
641 to those of recently hired TT ecology faculty at R1 universities (median 7, mean 8.6, middle 50%
642 5-10, range 0-50). Women ecology faculty job seekers have fewer first-authored publications
643 than men on average (mean 6.8 for women, 10.5 for men; medians 6 and 9, respectively).

644 The take-home message here for faculty job seekers is not that first-authored publications
645 and publication venue don’t matter for faculty hiring decisions at research universities, but that
646 many other factors matter as well.

647 **Concluding advice for ecology faculty job seekers**

648 **Variability is the rule.** Recently hired ecology faculty vary a lot on every easily-
649 measurable dimension. The range of qualifications that makes an applicant “competitive” for any
650 given position is wider than many ecology faculty job seekers—and even many ecology
651 faculty—probably realize. So if there’s a faculty position you think you might want, go ahead
652 and apply for it. Don’t take yourself out of the running by assuming that you’re not
653 “competitive”.

654 **Fit matters.** Most easily-measurable attributes of faculty job seekers have no predictive
655 power for how many interviews or offers they will receive. That’s because faculty search
656 committees don’t decide who to interview or hire based on crude quantitative metrics like years
657 of experience, publication count, h-index, etc. Rather, they evaluate applicants holistically,
658 paying great attention to attributes that can’t be measured, particularly fit to the position. This
659 doesn’t mean hiring decisions are arbitrary, of course; some applicants really do fit any given
660 position better than others.

661 **Don’t be more pessimistic than the data warrant.** The ecology faculty job market is
662 competitive, and being on the market can be very stressful. But in polls conducted on Dynamic
663 Ecology, I’ve noticed a consistent pattern: ecologists are consistently more pessimistic about the
664 ecology faculty job market than is warranted by the data. As a group, ecologists seriously
665 underestimate the percentage of women among recently hired ecology faculty (the modal guess
666 is 40% women). They vastly overestimate the minimum number of first-authored publications
667 required to be hired as an ecology professor at an R1 university. Substantial pluralities think that
668 most recently hired ecology faculty got their Ph.D.s from a relatively small number of “elite”
669 institutions, and that “elite” institutions only hire ecology faculty with Ph.D.s from “elite”
670 institutions. And most overestimate the fraction of ecology faculty positions filled by current

671 employees of the hiring institutions. This misdirected pessimism seems unfortunate. Data can't
672 tell anyone how to feel, and there absolutely are good reasons why anyone on the ecology faculty
673 job market might feel stressed. But hopefully these data will reassure some job seekers and help
674 them avoid baseless sources of stress.

675 **All faculty job seekers are in the same boat.** In a competitive faculty job market, it's
676 easy to fall into the trap of believing that people like you—people with your interests, skills,
677 experience, and connections—aren't getting many or even any offers. But here's the thing:
678 everybody thinks that—and everybody is right. On a competitive job market, everybody has it
679 tough. Women. Men. Quantitative ecologists. Field ecologists. People with connections to the
680 hiring department. People with no connections to the hiring department. More experienced
681 people. Less experienced people. Etc. So try not to resent faculty job seekers who differ from
682 you in some way; they're all in the same, competitive boat as you.

683

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