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MEASURING SOCIAL MOVEMENT ORGANIZATION POPULATIONS: A COMPREHENSIVE CENSUS OF U.S. ENVIRONMENTAL MOVEMENT ORGANIZATIONS*

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Population-level analyses of SMOs typically have relied on a single source for data, most commonly the Encyclopedia of Associations (EoA). However, the validity of this procedure has been drawn into question by recent organizational studies. To examine the impact of using different sources to estimate SMO populations, we compile a comprehensive population dataset of national and regional U.S. environmental movement organizations (or EMOs) over a 100-year time period using 155 different sources. We use this data to evaluate the accuracy and selection biases in five major compilations of U.S. EMOs. The analysis shows that all single sources are selective, tapping specific sections of the environmental movement. Multiple sources are needed to capture a comprehensive population of EMOs. Researchers should be aware of the limitations of specific sources before drawing conclusions about population parameters.

The study of social movement organizations (SMOs) is a rapidly growing field. There have been several dozen studies of the population of social movement organizations, typically relying on a single source for data (Baumgartner and Jones 1993; Baumgartner and Leech 1998; Edwards and Marullo 1995; Fligstein and Brantley 1992; Hannan and Freeman 1987; McLaughlin and Khawaja 2000; Minkoff 1994, 1995, 1999; Smith 1997). Recent research, however, suggests that the use of a single source is potentially biased as a measure of SMO populations (Edwards and Andrews 2002; Andrews and Edwards 2004, 2005). In their study of local environmental movement organizations in a single state, Andrews and Edwards (2005) used 27 separate lists, and concluded that no single source could sufficiently capture this SMO field. This raises questions about the validity of studies of SMO populations at the national and regional, as well as the local, level.

The most common source used for SMO research is the *Encyclopedia of Associations (EoA)*, a multiyear directory of national organizations in the United States.¹ The key advantage is that it is readily available, cumulative, and covers a broad set of movement sectors. Moreover, *EoA* staff are rewarded for finding new organizations, a practice that indicates that the directory is fairly comprehensive. Martin et al. (2006) found that the *EoA* has been used in twelve SMO studies, and in nine as a sampling frame of organizations. Detailed comparisons to other data sets on state and local environmental groups (Andrews and Edwards 2004) and peace groups (Edwards and Foley 2003) show, however, that this directory series is biased toward large, Washington D.C. based organizations. Additionally Minkoff (2002) points out that *EoA* is biased towards stable organizations and those that use conventional tactics. In their study of peace SMO deaths, Edwards and Marullo (1995) used the *Grassroots Peace Directory* to insure that they tapped a more diverse set of local and regional, as well as national, organizations. Recently, Martin, Baumgartner, and McCarthy (2006) evaluated the representativeness of the *EoA* for studying national labor unions, finding it to be comparable to data collected by the U.S. Department of Labor. This result may,

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however, reflect the particular movement sector, where national labor unions are subject to federal reporting requirements, are relatively stable, and have offices in Washington, D.C., facilitating their inclusion in the *EoA*.

An unexamined question is the use of the *EoA* or any other single information source to study national and regional environmental movement organizations (EMOs). In comparison to national labor union organizations, the environmental movement is more diverse and geographically dispersed. It likely exhibits higher rates of organizational turnover, which makes estimating populations much more difficult, especially when attempting to study these populations longitudinally. The *EoA* was originally intended to focus on voluntary associations and, although it has expanded coverage to include non-membership charitable and service organizations [501(c)(3) corporations], it may still under-represent that sector and other sectors of the environmental movement.

Our analysis may have implications beyond the study of the environmental movement. Organizational studies have found significant selection biases built into traditional methods for constructing population data sets in non-movement areas (Kalleberg, Marsden, Aldrich, and Cassell 1990). As with the study of riots and protest events (for example, Myers and Caniglia 2004), there may be significant biases from relying on a single, although reputable source. Questioning the validity of a use of a single source for compiling organizational populations, however, is not usually a significant concern. Kalleberg et al. (1990: 658) note that: "Neither investigators themselves nor critics writing review articles feel compelled to say much, if anything, about possible biases in sampling or the extent to which samples are representative of broader populations." To ensure the validity of studies of SMO populations, it is important that the question of possible selection bias be explicitly evaluated.

We assess the adequacy of coverage of U.S. national and regional EMO populations based on a database compiled from a comprehensive review of organizational directories. We start by describing how we constructed a comprehensive EMO population data set that covers the time frame from 1900-2000. We then discuss how specific information was compiled for each organization regarding its founding and disbanding years, discursive frame, and extent of environmental involvement. Using this data set, we then assess the validity of different sources of organizational data in terms of adequacy, accuracy, and bias, and present an analysis of the organizational population dynamics of the national and regional organizational population of the U.S. environmental movement. We conclude with a discussion of the implications of this paper for the further study of SMO populations.

CREATION OF AN ENVIRONMENTAL MOVEMENT ORGANIZATION POPULATION DATASET

We started by compiling a population dataset that aimed to include all U.S. national and regional environmental movement organizations that were in existence during any part of the time period from 1900-2000. The first step was to identify and gather all potentially relevant organizational directories that are currently in existence. To identify the relevant directories, a subject heading search using "'Associations, institutions, etc. - United States - Directories'" was conducted using the WorldCat Data Base. WorldCat is the world's largest library catalog, containing the merged catalogs of over 10,000 major libraries worldwide. Next, the most recent edition of the *Directory in Print* (Gale 2003) was reviewed for any additional organizational directories. Also, a series of other printed sources (for example, books and conference proceedings), online Internet directories, and the 2003 IRS *Master File of Tax-Exempt Organizations*, were identified as potential sources of organizational population information. This yielded a total source list of 155 distinct sources of organizational population listings. The list includes the IRS *Master File of Tax-Exempt Organizations*, 20

serial or multi-year directories, 67 single-year directories, 19 other printed sources, and 48 Internet lists. The complete list of these sources is available from the authors.

The availability of directories was not uniform for all of the years. Only one data source, the *Conservation Directory*, covered the entire time period from 1900-2000. This directory originally started in 1900 as the *Directory of Officials and Organizations Concerned with the Protection of Birds and Game*, and was published on an annual basis by the Department of Agriculture up until 1935, when it was taken over by its current author, the National Wildlife Federation. During the period prior to 1950, there were three additional directory series and fourteen individual sources (directories or other printed sources). Thus coverage prior to 1950 was surprisingly strong. Coverage between 1950 and 1969 was perhaps the weakest period. There was only one new conservation directory series published during this time, and five individual sources. The advent of the *EoA* in 1956, in combination with the *Conservation Directory*, adds to the adequacy of coverage of this time period. Finally, the period from 1970 to 2000 has strong coverage with the addition of 13 additional series and 69 single directories. Additionally, in the post-1995 time period, Internet web directories began to appear, which added significantly to the coverage of smaller and newer EMOs.

This allows the construction of longitudinal data on EMOs from multiple sources for the entire 20th century. Although a high proportion (43%) of the sources were single source (67 one-time directories), these provided very little additional information beyond the serial directories. In total, they only added 15% of the total EMOs identified. While we cannot claim to have captured every national/regional EMO that existed in this period (see our population estimation below), this appears to be the most comprehensive tabulation of EMOs in existence.

Selection of Environmental Movement Organizations

The second step was to review the listings in these directories to identify national and regional EMOs. An EMO was defined as any national or regional organization that seeks to bring about improvement in the natural environment. We deliberately cast a wide net to include organizations with environmental concerns, such as the animal rights movement and public health advocacy. We also coded the discursive frame of each organization so that future researchers can select particular sections of the environmental movement. National and regional organizations were identified, following Andrews and Edwards (2004), as organizations with activities that extend beyond a single state. Additionally, the following types of organizations were excluded:

1. *Organizations with a local focus or foreign organizations.* "Local" is defined as an organization with activity in only one state or community. If, however, a local organization was described with some national activity (either currently or historically), it was included. International environmental organizations without a U.S. chapter were excluded.

2. *Government organizations.* Government organizations are those whose participants are exclusively government officials or government departments. This includes interstate commissions, government advisory boards, or elements of any government agency. If an organization includes government organizations as well as individuals or organizations from the private sector (for example, an umbrella organization or a joint government/non-profit organization membership), we included the organization.

3. *Industry trade associations.* Organizations that represent for-profit firms or industries (including umbrella trade associations) were excluded. On the other hand, joint industry, public, and government organizations (for example, umbrella organizations) that seek to influence industrial practices were included.

4. *Foundations without an operational function.* Foundations that are solely involved in issuing grants to environmental organizations were not included, unless they had some type of operational function aimed at environmental improvement.

5. *Anti-environmental advocacy organizations.* Advocacy groups whose sole purpose is to counter the goals of pro-environmental organizations were not included. Those that take pro-environment stances on some issues and anti-environmental stances on others were included.

6. *Strictly humane society/animal rights organizations with no secondary environmental concerns.* Organizations strictly concerned with protecting the welfare of household pets and animal rights without any connection to environmental issues were excluded.

7. *Strictly outdoor recreation.* Organizations that are strictly recreational (for example, hiking, fishing, and hunting clubs) were excluded unless they showed clear evidence of environmental concern.

8. *For-profit organizations.* Organizations that provide products or services for profit were excluded.

BUILDING THE DATASET

We started by reviewing the *EoA* and the *Conservation Directory*, beginning with the online version of *EoA* (Associations Unlimited). Organizations were selected based on the keyword headings (full list available from the authors) for both national and international U.S. organizations. We then went through each print edition of the *EoA*, starting in 1956 and continuing through the 2002 edition. All organizations that met the above criteria were included and organizational characteristics coded (discussed below). We tracked the first year each organization appeared in the *EoA*, the year it stopped appearing, and any mergers, absorptions, and name changes so as to protect against counting an EMO twice. The entire *Conservation Directory* series was also processed in the same manner, starting with the online version, which was accessed in October 2003, and then yearly print volumes from 1900 to 2002.

We then reviewed the IRS 2003 *Master File of Tax-Exempt Organizations*. We initially selected organizations based on the relevant IRS and NTEE activity codes (available from authors). Additionally, we reviewed two electronically maintained files: the *National Environmental Directory*² compiled by Harbinger Communications; and *Rachel's Hazardous Waste Directory*³ compiled by the Environmental Research Foundation. These three searches generated a file of over 14,000 individual organizations, which we then resolved through name merging (including alternative names) against the *EoA-Conservation Directory* list.

To identify organizations that met the above criteria for being a national/regional EMO, we then comprehensively reviewed all annual descriptions in the *EoA* and *Conservation Directory*, and consulted organizational websites and the Internet Archive at the "Wayback Machine."⁴ This produced a list of 4,609 EMOs that operated between 1990 and 2000. All sources in which each EMO appeared were recorded so that we could examine the selection biases of the five major data sources. We then reviewed a range of smaller serial and single edition directories, entering only new EMOs that were omitted from the five major sources. This process added 997 EMOs or about 17.8% of the total list. While this limits our ability to evaluate the specific smaller lists, it allows us to compare all "other" sources with the five major sources.

Dating Organizational Founding and Disbandment

To capture the founding and disbandment (including mergers) of EMOs, we recorded the years for these events for all organizations in the data. We followed these procedures in priority order, entering information in the earlier steps and checking against that information in the later steps.

1. *Directory-reported dates.* We used the founding date listed, the dates for mergers, and organizational deaths based on being listed as defunct in the *EoA* or no longer appearing in multiple editions of the *EoA* and the *Conservation Directory*. When an organization was absorbed by another, the absorbed organization was considered disbanded and the year of the absorption was treated as its disbanding date. When one organization merged with another to form a new organization, both former organizations were considered defunct and the merger year was treated as the disbanding date.

2. *Internet search.* We reviewed each organization's website for reference to the years of founding, merger, or disbanding. If an organization's website was no longer active, we used the "Wayback Machine" Internet archive website to access its historic website. If no specific information was found on the webpage, we used the earliest webpage date reference (plus one year, assuming at least one year lag between founding and a website) as the founding date and the last webpage date as the defunct date.

3. *IRS ruling date.* Using organizations on which we had both the founding date from a directory and an IRS tax-exemption ruling date, we calculated the median difference between these two dates. The median length of time from obtaining IRS tax-exempt status after founding was one year. Thus, for EMOs where we were able to obtain the ruling date but not the founding date, we estimated the founding date as the IRS ruling date minus one year.

4. *WorldCat publication search.* Using the World Catalog (described above), we conducted searches for the dates of publications authored or published by the organization. The starting date of a periodical publication was assumed to be the founding date of an organization, and the date of ceasing publication was assumed to be the defunct date.

5. *ProQuest Historical Newspapers Data Base.* We searched the online versions of the historic publications of the *New York Times*, *Washington Post*, and *Christian Science Monitor* contained in the ProQuest Historical Newspapers Data Base for mention of the organization's name. We select these because they provide longer time coverage.⁵ Founding date was based on the year of first mention of the organization in any of these newspapers.

6. *Initial appearance or failure to appear in directories.* If we were unable to determine the year of founding or becoming defunct through any of the above methods, we used the date that the organization first appeared in the *EoA* or *Conservation Directory* as its founding year, and the year it no longer appeared as its defunct date. This practice can be hazardous (as discussed below), but it avoids discarding data. It was used only as a last resort when all other methods failed. It was used very infrequently, and constituted less than 1% of the founding date determinations.

As a result of following these procedures, we were able to estimate founding dates for a total of 5,428 of the organizations in the database, or 97% percent of our national/regional EMOs.

Primary Discursive Frames

Organizations were coded into the eleven major discursive frames that describe the U.S. environmental movement (Brulle 2000), as summarized in Table 1. The primary discursive frame was determined by reviewing the following sources.

1. *Organization-produced documents or statements.* These included mission statements, fundraising letters, position statements, news releases, annual reports, program and project descriptions, publications, action alerts, and website statements.

2. *Internet references.* These included article and interview references, event listings, coalition issue statements, litigation court documents.

3. *Description of organization in directory.*

Degree of Environmental Involvement

In our reviews of organizational mission and goal statements, we encountered organizations with different levels of involvement in addressing environmental improvement. For example, Greenpeace is clearly an environmental organization, and addressing environmental problems is its primary purpose. The Union of Concerned Scientists, in contrast, has a significant involvement in environmental problems, but also is involved in nuclear issues, food, and the integrity of scientific inquiry, which are not conceptualized in environmental terms. While its involvement in the environmental movement is significant, the environment is not its sole or primary focus. Finally, we encountered organizations, such as the American Lung Association, that are not normally considered an environmental organization. Yet the American Lung Association has a program that focuses on air quality and the natural environment. It has a minor involvement in the environmental movement. A significant portion of the organizations we encountered fit into the category of having a substantial (25% to 50%) or minor (< 25%) involvement. This gave rise to the question of whether these organizations should be included in the environmental movement.

Table 1. Major Discursive Frames in the U.S. Environmental Movement

Wildlife Management:	Wildlife should be managed to insure adequate supply to provide for the recreational use of humans in terms of hunting or fishing.
Conservation:	Natural resources should be technically managed from a utilitarian perspective to realize the greatest good for the greatest number of people over the longest period of time.
Preservation:	Nature is an important component in supporting both the physical and spiritual life of humans. Hence the continued existence of wilderness and wildlife, undisturbed by human action is necessary.
Reform Environmentalism:	Human health is linked to ecosystem conditions. To maintain a healthy human society, ecologically responsible actions are necessary. These actions can be developed and implemented through the use of natural sciences.
Environmental Health:	Human health is the outcome of interactions with physical, chemical, biological and social factors in the natural environment, especially toxic substances and pollution. To ensure community health requires a livable and healthy community, with adequate social services, and elimination of exposures to toxic or polluting substances
Deep Ecology:	The richness and diversity of all life on earth has intrinsic value, and so human life is privileged only to the extent of satisfying vital needs. Maintenance the diversity of life on earth mandates a decrease in human impacts on the natural environment, and substantial increases in the wilderness areas of the globe.
Environmental Justice:	Ecological problems occur because of the structure of society and the imperatives this structure creates for the continued exploitation of nature. Hence, the resolution of environmental problems requires fundamental social change.
EcoFeminism:	Ecosystem abuse is rooted in androcentric concepts & institutions. Relations of complementarity rather than superiority between culture/nature, human/nonhuman, and male/female are needed to resolve the conflict between the human and natural worlds.
EcoSpiritualism:	Nature is God's creation, and humanity has a moral obligation to keep and tend the Creation. Hence, natural and unpolluted ecosystems and biodiversity needs to be preserved.
Green:	All humans and their communities deserve to live in an equitable, just and environmentally sound world. Global abuses - such as ecological destruction, poverty, war, and oppression - are linked to global capitalism and the political and economic forces that have allowed the development of social inequality and injustices.
Animal Rights:	All species have intrinsic rights to realize their own evolved characteristics, and to live an independent life free from human direction or intervention.

Social movement studies have, on the whole, adopted an essentialist definition of a SMO based on goals (McCarthy and Zald 1987), political access (Tilly 1978), and/or contentious tactics (McAdam 1982). Organizations are “inside” or “outside” of the movement based on one of these definitions or by virtue of being included in a movement directory. At least in the environmental movement, we could not rely on that method. There are numerous non-profit

organizations involved in environmental problem-solving whose primary purpose is not environmental improvement. Instead of imposing an exclusive definition, it seems better to recognize degrees of involvement, thereby shifting from essentialist to population thinking (Sober 1980). As Andrews and Edwards (2004) argue, there is a need to recognize multiple criteria and, for our purposes here, a range of involvement. Some SMOs have a major focus on environmental issues, others have substantial involvement, and others have a minor involvement. We recognize this range of involvement by scoring EMOs based on their degree of involvement in environmental efforts. Andrews and Edwards (2005) adopted a similar scheme in their research on local environmental organizations, recognizing that social movement organizations “operate across multiple movement domains” (2005: 217). We distinguish three levels of involvement:

1. *Major Focus*. Addressing environmental issues is the primary purpose of the organization. More than 50% of the organization’s programs are committed to environmental issues.

2. *Substantial Focus*. Addressing environmental issues is substantial component of the organization’s activity, but doing so is not its primary purpose. An estimated 25% to 50% of the organization’s programs are focused on environmental issues.

3. *Minor Focus*. Addressing environmental issues is part of an organization’s efforts, but is not a substantial activity of the organization. Less than 25% of the organization’s programs are committed to environmental issues.

As with coding the primary discursive frame, the degree of environmental involvement was coded using organization-produced mission statements and program descriptions, internet references, and descriptions in directories. Each senior investigator provided an estimate of the degree of involvement with disagreements resolved by discussion. It would be useful to confirm our estimates with budget data or organizational surveys but such efforts were beyond the scope of this project. We were able to code both discursive frame and involvement for 5540 organizations or 99% of the sample.

Intercoder Reliability

To assess intercoder reliability for the discursive frame and degree of environmental involvement, we used two test measures: (1) Cohen’s (1960) Kappa; and (2) Perreault and Leigh’s (1989) Reliability Index. At any given time there were up to four people coding: two student coders and two supervisory coders.⁶ All student coding was confirmed by one of the two supervisory coders. Since all student-assigned codes were verified by one of the supervisory coders, we focus on the inter-reliability of the two supervisory coders. Overall, they agreed 93 percent of the time on primary discursive frame, creating a Cohen’s Kappa (*K*) of .93 and a Perrault-Leigh Reliability Index (*Ir*) of .96. This coding also included a verification of the selection of the organization as a legitimate environmental organization, based on the criteria discussed. For the degree of environmental involvement, the supervisory coders agreed 86 percent of the time, creating in a *K* of .80 and an *Ir* of .90.

These results indicate a high level of intercoder reliability. Krippendorff (1980) suggests that a significant and meaningful level of reliability can be established at .80 or greater. Perreault and Leigh (1989) claim that .90 constitutes a high level of intercoder reliability, and suggest that the coding process can be reduced to one judge at that level. “If a multijudge evaluation on a subsample of responses shows that the reliability of the coding process is high (e.g., *Ir* > .90), it may be reasonable to complete the coding process with only one judge per response” (Perreault and Leigh 1989: 147).

EXTENT OF COVERAGE

A key question about any organizational population data is the adequacy of coverage. How well does our data compare to the real world total population of EMO's? Since we can only examine the organizational lists that are available and not the real world population, we have to estimate the latter from the former. In addition, we wanted to assess the source bias associated with different sources.

Population Coverage

To estimate the real world population of EMOs, we use the Lincoln-Petersen method for population estimation (Phillips, Dreslik, Johnson, and Petzing 2001; Seber 1982; Williams, Nichols, and Conroy 2002). This method is commonly used in population ecology to estimate the size of a given animal population by taking two samples. Individuals are marked in the first sample and not removed from the population. Instead, they are released to the wild. A second sample is then taken. Based on the overlap between the two samples, the overall population is estimated. Applying this logic to the sampling of organizations yields a population estimate based on the following formula:

$$N = \frac{(n1 + 1)(n2 + 1)}{(m + 1)} - 1$$

where:

N = Estimate of total population size.

n1 = Total number of organizations captured in the first sample.

n2 = Total number of organizations captured in the second sample.

m = Number of organizations captured in the first sample that were recaptured in the second sample.

Using the combined number of EMOs captured from the *EoA* and the *Conservation Directory* as the first sample resulted in the identification of 1,926 total EMOs (n1=1,926). The EMOs captured from the IRS Master File was then used as the second sample, identifying a total of 3,258 EMOs (n2 = 3,258). Of these, 953 had been previously recaptured from the first sample (m=953). This recapture rate yields an estimated population of 6,582 national and regional U.S. EMOs. From this population estimate, our compilation in this research of 5,606 environmental organizations contains approximately 84 percent of the actual population of EMOs. This is a high level of inclusion, leading us to conclude that it is the most comprehensive that can be constructed given existing data availability.

Individual Source Coverage

We assessed the question of individual source coverage by comparing the five major data sources and the combination of smaller serial and single directors (called "other") used in compiling this data set. Table 2 shows the results for the number of organizations covered by multiple sources as well as unique additions from each major source and all other sources combined. Because the IRS *Master File* and the web directories are single-year sources while *EoA* and *Conservation Directory* are serial sources, this is, in effect, a cross-sectional comparison for 2003. Of the 5,606 organizations, 82.2% (4,609) were found in the five major sources. Of these, the IRS *Master File* added the largest number of unique organizations, followed by the *EoA* and the *Conservation Directory*. This result is somewhat surprising because the IRS *Master File* is a single-year source and misses organizations that went defunct prior to 2002. Notably, there is very little overlap between sources. Over half (52%)

of the organizations identified appeared in only one source and only 1.1% (60) were identified in all five major sources.

Table 2. U.S. Environmental Organizations by Source

Contribution by Source	Number	% of Organizations
In all 5 Major Sources	60	1.1
In 4 Major Sources	177	3.2
In 3 Major Sources	377	6.7
In 2 Major Sources	1098	19.6
In 1 Major Source Only	2897	51.7
Only in Conservation Directory	202	3.6
Only in Encyclopedia of Associations	566	10.1
Only in IRS Master File	1768	31.5
Only in National Environmental Directory	189	3.4
Only in Rachel's Hazardous Waste Directory	172	3.1
Total – 5 Major Sources	4609	82.2
Total -- All Other Sources	997	17.8
<i>Total</i>	5606	

We also examined the potential contribution of each specific source. Table 3 shows the total number of organizations that would have been identified if only that one source had been used. For example, had only the *EoA* been used to compile this dataset, it would have yielded fewer than 1,500 organizations, or 26.5% of the final dataset. If both the *EoA* and the *Conservation Directory* had been consulted together, they would have yielded only 34% of the population. The source with the highest coverage was the *IRS Master File*, at 58% more than double the number of organizations listed in the *EoA*. Of that percentage, 41% of the *IRS* listed organizations were neither in the *EoA* nor the *Conservation Directory*. This is especially striking because the *Master File* is a single-year source (2003), while *EoA* and *Conservation Directory* are series with many editions. The remaining two major sources, the *National Environmental Directory* and *Rachel's Hazardous Waste Directory*, yielded the lowest unique proportion of listed organizations (14%). Both are single-year cross-sections.

Table 3. U.S. Environmental Organization Coverage by Source

Complete Listings by Major Source	Total In Directory	Percent of Total Organizations
Encyclopedia of Associations (<i>EoA</i>)	1484	26.5
Conservation Directory (CD)	901	16.1
In IRS Master File	3258	58.1
In National Environmental Directory	793	14.1
In Rachel's Hazardous Waste Directory	796	14.2

In using each major source, we noted several characteristics that affect its reliability and validity. We draw on both our coding of these sources and our statistical analysis of source bias below. Since the *EoA* is currently the most frequently used single source, we focus our comments on it, followed by shorter discussions of the other data sources.

Encyclopedia of Associations. As noted above, the *EoA* accounted for 26.5% of the total organizations. Beyond its modest organizational coverage, the *EoA* also has reliability problems that make for inconsistent and potentially inaccurate organizational data. First, since the environmental movement is quite broad and diverse, this required the use of a large

number of *EoA* sections and keywords. EMOs were found in ten sections (i.e., chapters in each edition) and represented by more than 168 *EoA* keywords (listed in Appendix B). These keywords vary across time along with the section locations of specific organizations, which moved from year to year. In addition to requiring considerable time for assessment, this creates possible human error. Second, Minkoff's (2002) description of the limitations of the *EoA* proved accurate. Small and short-lived organizations, those headquartered outside of Washington D.C., and newer organizations were less likely to be included (see below).

The accuracy of *EoA* listings is problematic. Several EMOs appeared in the directory for only one year and never again with no mention of being defunct or address unknown. We also discovered several instances where the *EoA* did not observe organizational name changes over the years, making assessment of defunct status extremely difficult. In 17 instances, the *EoA* stopped listing an organization because it was inaccurately described as "defunct," "address unknown," "merged," or for no apparent reason, when, in fact, the organization was still alive and active based on the listings in other directories. A glaring example of inconsistent listing is the Sierra Club Legal Defense Fund, which is one of the largest and most prominent U.S. environmental organizations. The *EoA* started listing this organization (founded in 1971) in 1976 and last listed it in 1994, describing it as "address unknown." Still active today, this organization changed its name in 1997 to the Earthjustice Legal Defense Fund (Earthjustice), and, by the 2004 edition, the *EoA* still had not re-listed the organization, either as a name change or as a new entry.

We also evaluated the time lag between the founding of an organization and its entry into the *EoA*. This provides a crude gauge of the completeness of the data source. There was significant variance in the average time between the founding of an organization and its listing in the *EoA*, ranging from 1 to 40 years.⁷ Table 4 shows the average listing time broken down by each decade since the directory was first published in 1956.

Table 4. Average Listing Time from Founding to Appearance in the *Encyclopedia of Associations*

Decade of Publication of EOA	Average Time Lag (Years)
1956-1959	1.7
1961-1968	6.9
1970-1979	8.2
1980-1989	7.9
1990-1999	10.6
2000-2002	11.6
1956-2002 combined	7.8

For this analysis, organizations that were founded before the first edition were all given a 1955 founding date so as to compensate for what would otherwise be a heavily skewed average for the first few editions; without this compensation, the first decade would have shown an average of 21 years listing time. As it is, the first decade's (1956-1959) average is deceptively low (1.7 years) due to this compensation, as well as there having been only two editions published (1956 and 1959) during this period. The overall average listing time for all editions published was 7.8 years. When broken down by decade, there is a steady increase of average listing time with each new edition, starting with an average of 6.9 years for the 1960s (1961-1968 editions) and ending with an 11.6 year average for the 2000-2002 period. The only exception is the 1980s, where the average dropped slightly, to 7.9 years, from 8.2 years in the 1970s. It increased in the 1990s to 10.6 years. This means that at least a decade must have passed before *EoA* can be reliably assumed to have captured the founding of new organizations.

In sum, at least for the environmental movement, the *EoA* alone is a limited source of population information. It has limits of coverage, inconsistent indexing, significant inaccuracy regarding disbandings, and a growing lag between organizational founding and first listing.

Since *EoA* purports to be a directory of national voluntary associations, its strength may lie in covering this section of the environmental movement.

Conservation Directory. The *Conservation Directory* accounted for 16.1% of the total organizational population. This may reflect the fact that the directory was originally developed as a list of hunting, fishing, and conservation organizations. While limited in coverage, it is an excellent source for information on this sector of the environmental movement. It runs continuously for over 100 years, and so provides excellent longitudinal coverage. Organizations are listed alphabetically, and divided into International, National, and State/Local groups, making it easy to compile accurate counts of organizations. While there are a few instances of organizations being inadvertently dropped, this is rare.

IRS Master File. Of the five major sources, the 2003 *IRS Master File* lists more than half of the EMOs in the data set. Despite its temporal limitations, it has the highest level of coverage of any of our major sources. Nonetheless, it has significant limitations. First, it is extremely difficult to work with. The NTEE and IRS Codes (available from authors) provide only a marginal identification capability. After selecting on these codes, we were presented with a bewildering variety of organizations. Because of a lack of quality in the NTEE and IRS codes, review required considerable effort to remove non-environmental organizations. Additionally, many smaller and more radical organizations decide not to obtain IRS tax exemption (Andrews and Edwards 2004), which limits coverage. It is limited to charitable, 501(c)(3) organizations, which suggests it may better capture non-membership organizations primarily involved in educational and charitable work.

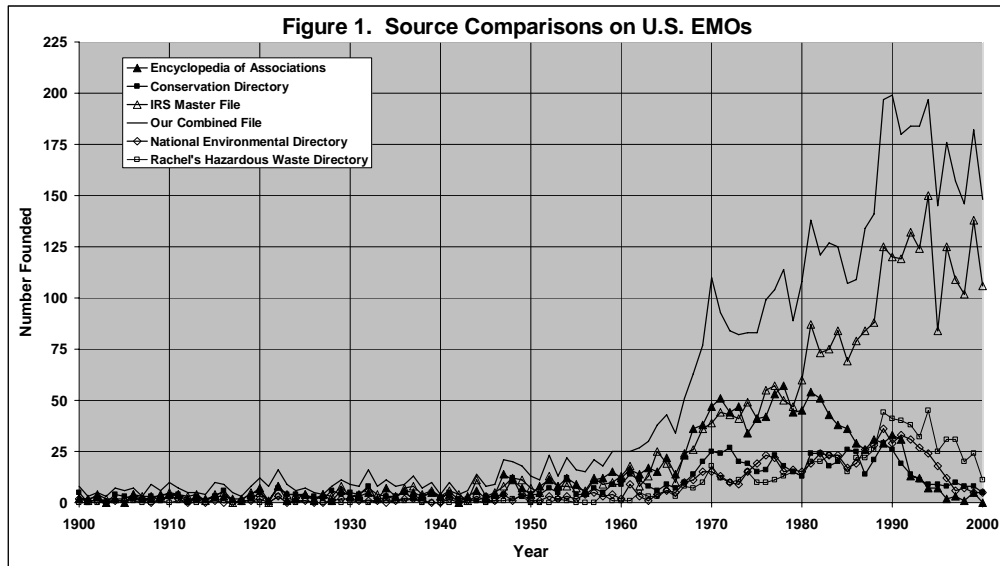
National Environmental Directory and *Rachel's Hazardous Waste Directory.* These two data sources were single-year directories for 2003 obtained in electronic form from the organizations that compiled these data sets. Both were relatively easy to use. Each file covered about 14% of the total organizational population. The *National Environmental Directory* provided a listing very similar to the *EoA* and *Conservation Directory*. Even so, *Rachel's Hazardous Waste Directory* contributed a large number of more radical environmental organizations, especially those involved in environmental justice projects. Both stemmed from membership building efforts, and thus reflect the movement networks around which they were organized. Both included a large number of local EMOs that had to be excluded. Their unique advantage lies in capturing the newer more radical EMOs.

Longitudinal Coverage

We also assessed the longitudinal coverage of the different data sources. A key focus in SMO population studies is founding, that is, the formation of new SMOs. The graph of organizational founding by year for all five major data sources is shown in Figure 1. The result from our combined database is shown by the "Our Combined File" line on the graph. The significance of using different sources is illustrated by this graph.

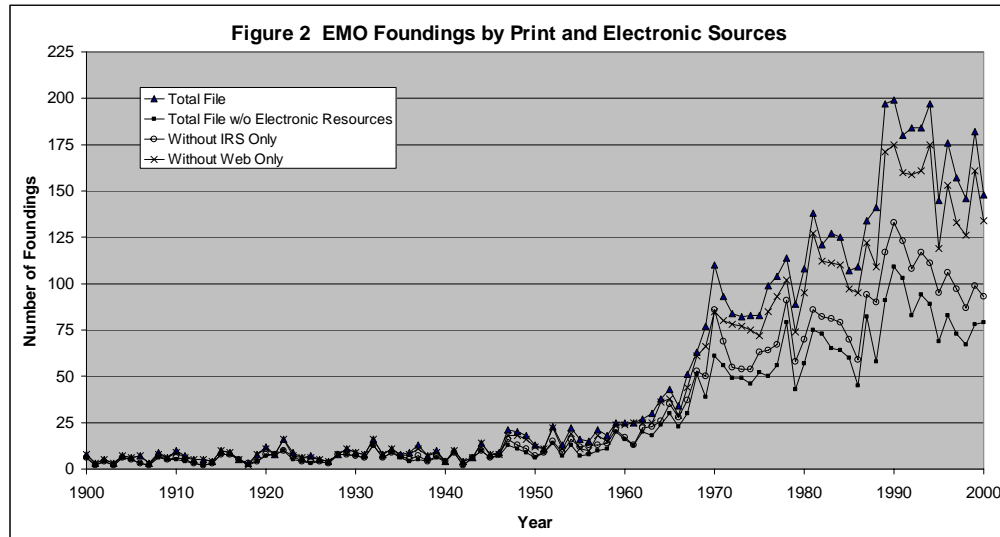
First, it is clear that up until around 1950, there is not much variation between the different sources. Yet, beginning in the 1960s, the total for "Our Combined File," along with the *IRS Master File* starts to depart from the trend of founding based on organizations found in both the *Conservation Directory* and the *EoA*. Up until about 1980, the *EoA* and the *IRS Master File* remain similar in the number of "births" for the corresponding years. It is after this point that the *IRS Master File* steadily increases in listings of founding while the *EoA* steadily decreases. This may reflect the fact that the *IRS Master File* is a single-year source that may underestimate defunct EMOs, but despite this limitation, it performs similarly to the other major sources. The *Conservation Directory* remains fairly level in its foundings per year, increasing slightly from the mid-1960s but then decreasing again after 1990. For "Our Combined File," the relatively high number of organizational births continuing through the 1990s corresponds to the increase of organizations represented by the more radical organizations found in *Rachel's Hazardous Waste Directory*. All of the directories, however,

illustrate a significant decline in founding throughout the 1990s. This may be partially an underestimate due to the lag between organizational founding and entry into the directories. The *IRS Master File* has no such lag, since it is an electronic file that is constantly updated.



This graph suggests that these sources provide different pictures of EMO founding. The *IRS Master File* correlates strongly with our combined file ($r = .98$) despite being a single-year listing while the *EoA* and *Conservation Directory* depart ($r = .56$ and $.72$ respectively). These departures are large enough that an analysis of founding rates would likely identify different predictors. The major divergence begins around 1980, when the *EoA* and *Conservation Directory* fail to keep pace with new EMO foundings, most likely due to covering large, mainstream organizations. We examine the discourse biases of these sources below and find significant gaps.

We also examined the impact of using electronic versus print sources. We used two electronic sources (other than electronic versions of the print directories described above): (1) a number of web directories (listed in Appendix A); and (2) the *IRS Master File*. Figure 2 shows the impact of electronic versus other sources on the estimated number of organizational founding. Using only print sources, we find a significantly lower number from 1970 on with the greatest gap in 1990-2000. This reflects the long time lag between organizational founding and inclusion in the print directories. Adding in the online web directories report slightly higher organizational founding. Finally, the inclusion of the *IRS Master File* (but not the web directories) shows an increased rate of organizational founding throughout the 1990s. As previously mentioned, this reflects the lack of a time lag from an organizational founding to inclusion in the *IRS Master File*. In sum, the greatest impact of the inclusion of electronic resources is found through the use of the *IRS Master File*, which effectively eliminates the lag problem found in print and web directories.



SOURCE SELECTION BIAS

As shown above, the use of different sources gives a different picture of the founding of EMOs. Do these sources provide a different picture of the population of EMOs? We used logistic regression to predict the probability that a given EMO appears in one of our five major sources and all “other sources” is included based on characteristics of the organization. This asks whether organizational characteristics shape the specific EMOs that get included in each source. Since three of our sources (IRS *Master File*, the *National Environmental Directory Online*, and *Rachel’s Hazardous Waste Directory*) are single-year, we had to exclude defunct organizations listed in the *Conservation Directory* and the *EoA* to make this comparison possible. Otherwise, estimates predicting inclusion in, for example, the IRS *Master File* would be compared against defunct organizations reported by *EoA* or *Conservation Directory*. We looked at three organizational characteristics: (1) headquarters location (coded Washington, DC Area, New York Area, California Area, and All Other Locations treated as the reference category); (2) year founded (treated as a quadratic); and (3) primary discursive frame.

Our assumption with location is that these three areas tend to be over-represented in the major directories. Because the “other” list is regionally diverse, we expect this list to be more representative of the rest of the country. To evaluate founding year, we used the quadratic of year founded, based on the idea that there is a tendency to list younger EMOs (that is, those with higher founding years) and that this tendency is curvilinear, decelerating most recently due to a listing lag (that is, the main effect should be positive and the squared term negative). The “other” list, which includes many directories from the early part of the 20th century, should show the opposite trend, covering EMOs founded in the early 20th century, as well as those founded most recently.

To analyze the discursive frames, we combined reform environmentalism and environmental health, which share a common scientific discourse and overlapping public health concerns, and all the newer alternative discourses (deep ecology, environmental justice, ecospiritualism, ecofeminism, green, and animal rights), which tend to be associated with organizations that lie ideologically outside the mainstream of the environmental movement (see below). We treat the alternative discourses as the reference category, meaning that all effects are relative to the inclusion of alternative discourses. The results are shown in Table 5.

Table 5. Logistic Regression Estimates for the Determinants of Source Inclusion

	Encyclopedia of Associations	Conservation Directory	IRS Master File	National Environmental Directory Online	Rachel's Hazardous Waste Directory	Other Sources
<i>Location Variables^b</i>						
DC Area	.659*** (.098)	0.634*** (0.111)	0.539*** (0.090)	-1.061*** (0.153)	0.566*** (0.105)	-.321** (.113)
NY Area	0.152 (.138)	-0.064 (0.168)	0.472*** (0.119)	-.089 (0.148)	0.578*** (0.136)	-.214 (.147)
CA Location	.069 (.120)	-0.250 (0.149)	0.543*** (0.099)	0.135 (0.115)	0.591*** (0.111)	-.584*** (.135)
<i>Age Variables</i>						
Year Founded	2.434*** (.178)	1.533*** (0.189)	-0.527*** (0.144)	1.375*** (0.222)	0.303 (0.229)	-.085 (.158)
Year Founded ^{2a}	-.632*** (.046)	-0.398*** (0.048)	0.136*** (0.037)	-0.354*** (0.057)	-0.076 (0.058)	.021 (.041)
<i>Discursive Frames^c</i>						
Reform Enviro.	.409** (.137)	0.921*** (0.231)	0.340*** (0.096)	-0.317** (0.133)	-0.628*** (0.110)	-.452*** (.111)
Conservation	.238 (.151)	1.298*** (0.237)	0.645*** (0.111)	-0.250* (0.150)	-1.042*** (0.141)	-.676*** (.132)
Preservation	.253* (.141)	1.919*** (0.225)	1.028*** (0.103)	0.041 (0.130)	-0.949*** (0.121)	-1.313*** (.130)
Wildlife Management	.672*** (.212)	2.640*** (0.269)	0.875*** (0.183)	-0.084 (0.223)	-1.362*** (0.295)	-1.108*** (.248)
Constant	-2345.35*** (173.76)	-1478.41*** (184.01)	507.71*** (140.94)	-1333.88*** (217.01)	-303.57 (224.87)	86.06** (154.41)
N	4795	4795	4795	4795	4795	4795
Pseudo R ²	.148	.131	.032	.042	.038	.033

* $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$, one-tailed tests. Standard Errors are in parentheses.

^a Coefficients and Standard Errors are multiplied by 1,000 to aid in interpretation.

^b Reference category is other parts of the country.

^c Reference Category is alternative discourses

Except for *National Environmental Directory On-Line* and the “other” list, all of our major sources favor EMOs located in the Washington DC area. *The National Environmental Directory Online* and “other” list are biased against including organizations headquartered in the DC area. While most of the major sources are biased towards including EMOs in DC, only the *IRS Master File* and *Rachel's Hazardous Waste Directory* are significantly more likely to include those organizations headquartered in DC, NY, and California. The “other” sources are biased against EMOs headquartered in California. In sum, there is a significant positive bias towards including EMOs in these three regions by the major directories and the *National Environmental Directory* and our “other” sources provide greater regional coverage.

We use a quadratic for the year founded to test the idea that more recently EMOs are more likely to be covered but this decelerates for the most recent years. The shape of this curve, however, varied across our sources. The *EoA*, *Conservation Directory*, and *National Environmental Directory Online* fit the curvilinear hypothesis, showing a positive main effect

and a negative squared effect. This fits the argument about the advantages of newness and the listing lag discussed earlier. The IRS *Master File* shows the reverse pattern, tending to include older EMOs along with the newest EMOs. This suggests the IRS tends to include longstanding EMOs as well as being more up to date. There are no significant year-of-founding effects for either *Rachel's Hazardous Waste Directory* or "other" sources.

We also found selectivity by primary discursive frame. The *EoA* favors EMOs promoting reform environmentalism/environmental health, preservation, and wildlife management relative to alternative discourses. Both *Conservation Directory* and the *IRS Master File* selectively include all four mainstream discourses, excluding alternative discourses. Both *Rachel's Hazardous Waste Directory* and the "other" list are selective against all of the mainstream discourses, favoring alternative discourses. There is also a bias against the inclusion of reform environmentalism and conservation discourses in the *National Environmental Directory On-Line*, which is an open access source to which EMOs can readily add their own information. Without having consulted these more dispersed and scattered sources of EMOs, alternative discourses would be significantly underrepresented in our dataset. If only the *Conservation Directory*, *EoA*, and the *IRS Master File* had been consulted, approximately 8% of the EMOs would not have been included, mostly the alternative discourse EMOs. This underscores the limits of each source and the virtues of drawing on diverse sources.

CONCLUSION

This analysis shows that the use of any single source is inadequate when studying the organizational population of the U.S. environmental movement. Multiple and varied sources are needed to capture a valid sample. This convergence with the findings of Andrews and Edwards (2004) on local EMOs. Based on our estimated EMO population, we were able to capture important characteristics of an estimated 84% of the "real world" national and regional EMOs that existed between 1900 and 2000.

We outline a method for developing a comprehensive SMO data base. Unfortunately, building such a data base is an extremely labor intensive process. This project required over two years of work by the two supervisory coders and the supervision of up to four student coders working on the project at any one time. Yet such resource commitments are necessary to create a valid organizational data base that can support social movement research. While this might not apply to all social movements, it certainly applies in the case of a social movement as varied and complex as the U.S. environmental movement.

We found that relying on a single source, however reputable and trustworthy, is questionable. At the minimum, researchers need to be cognizant of the biases built into any single source. Without building such a comprehensive population-level data base, an assessment of specific sources cannot be ascertained. In the context of the environmental movement, we found that the *IRS Master File of Tax-Exempt Organizations* is critical to capturing the charitable educational and charitable organizations. It selects against more radical organizations and, unless the huge amount of effort required to integrate historical IRS files is pursued, it misses older EMOs. Standard serial directories, such as the *EoA* and the *Conservation Directory* are useful in tapping national voluntary associations and mainstream discourses but display problems with reporting lag and are biased towards Washington, DC. based EMOs. The new online directories are invaluable at capturing newer and more radical EMOs but are inadequate for longitudinal analysis. The best way to gain better regional coverage appears to be to consult the larger number of smaller directories, which are widely dispersed and difficult to assemble.

Future work needs to address how these patterns work in other movements. The environmental movement is probably better documented, populated by more stable SMOs,

and more likely to gain tax-exempt status, all of which make it easier to study. More volatile movements, such as the peace movement, should be more challenging to study. Even in these cases, consulting multiple sources to identify SMOs is critical to avoiding false conclusions about population characteristics.

NOTES

¹ Other studies have used the *Yearbook of International Organizations* (Smith 1997) and the *Conservation Directory* (McLaughlin and Khawaja 2000).

² Available online at <http://www.environmentaldirectory.net/>

³ Available online at http://www.rachel.org/home_eng.htm

⁴ Available online at www.archive.org/web/web.phpto The Internet Wayback Machine allows access to inactive websites as far back as 1996.

⁵ Description available at http://www.proquest.com/products_pq/descriptions/pq-hist-news.shtml This database provides full text searching of stories that appeared in these papers as follows: *New York Times* (1851 to present); *Washington Post* (1877 to present); and *Christian Science Monitor* (1908 to present).

⁶ To ensure a high degree of coding accuracy, student coders were required to take an undergraduate course in U.S. Environmental Movements, and worked under the direct supervision of either a Ph.D. candidate or the study director.

⁷ The 40-year listing time-lag was the American Institute of Biological Sciences. It was founded in 1947 and did not appear in the *EoA* until 1996 (time-lag adjusted for the 1956 first edition).

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