

# ***NATIONAL WEATHER DIGEST: MORE THAN THREE DECADES OF SERVICE TO THE METEOROLOGICAL COMMUNITY***

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### ***Abstract***

For more than three decades, the *National Weather Digest* has provided a means for NWA members to publish research results or express opinions on matters important to the operational meteorological and related communities. Since *The Digest* was first published (1976), the papers published there have led to stronger partnerships between meteorologists in the public, private, and academic sectors, users of weather information and weather enthusiasts. *The Digest* was upgraded recently to an attractive, modern look and feel, with unlimited color graphics, and is now posted online as soon as it is published as a benefit of the new “members-only” portal on the NWA Web site. Previous issues are also available online for the benefit of all. Using data generated from articles published in *The Digest* since 1990, this study examines the characteristics of papers and their authors as published in *The Digest* for the past two decades by presenting statistics on the subject matter, type of article, primary data type, lead author affiliations, and author demographic information. The results show that the acceptance rates for *The Digest* are comparable to those of similar peer-reviewed publications. Also, most authors that publish in *The Digest* have published only one or two articles, are male, from the Southern or Central Regions of the National Weather Service (NWS), and work in the NWS or academia. However, *The Digest* draws authorship from members and non-members alike, and the topic of papers are most often phenomenological.

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## 1. Introduction

The National Weather Association (NWA) is an organization that was established in 1975 in order to bring together meteorologists who work in operational environments. However, the NWA has attracted meteorologists from across the spectrum of the discipline (and even other disciplines) and includes for example those who work primarily in television, operational, research, and university settings. The NWA's main publication over that 35 year period has been the *National Weather Digest* (referred to as "*The Digest*" here), which was first published as a quarterly journal in 1976. The NWA has also published a monthly Newsletter since 1976. The *Electronic Journal of Operational Meteorology* was established later and has been published since the year 2000. In the early days, *The Digest* resembled other publications such as the *Bulletin of the American Meteorological Society*, and *Weather* (published by the Royal Meteorological Society) in that it contained research articles, general interest stories, or general information for the NWA membership. In the late 1980s, the focus of *The Digest* changed as some of the material formerly published in *The Digest* was moved to the Newsletter. *The Digest* has since published research articles, research notes, case studies, technical reports, and book reviews.

Recently, a study by Schultz (2010) examined the acceptance rates of 47 journals publishing content in the atmospheric sciences. *The Digest's* acceptance rate of 75% (for 2006 – 2007) placed the NWA's main journal within the main part of the distribution of acceptance rates given in Schultz (2010), e.g., 79% of journals had acceptance rates of 40 – 75%. For comparison purposes, the *Electronic Journal of Operational Meteorology* had an acceptance rate of 56% in the same two year period cited above.

The goal of this article is to examine the characteristics of *Digest* publications since 1990 in order to provide the NWA membership with a profile of the publication. This study will examine such characteristics as first authorship, subject areas, and the geographic distribution of first authors, as well as trends in publications. Interestingly, the results will demonstrate that *The Digest* is not solely devoted to operational issues and studies, and that the expertise and affiliations of those who publish in *The Digest* are quite varied. Thus, the actual profile of *The Digest* may be different from that of the widely-held perception, even within the operational community, that the publication is only devoted to operational meteorology.

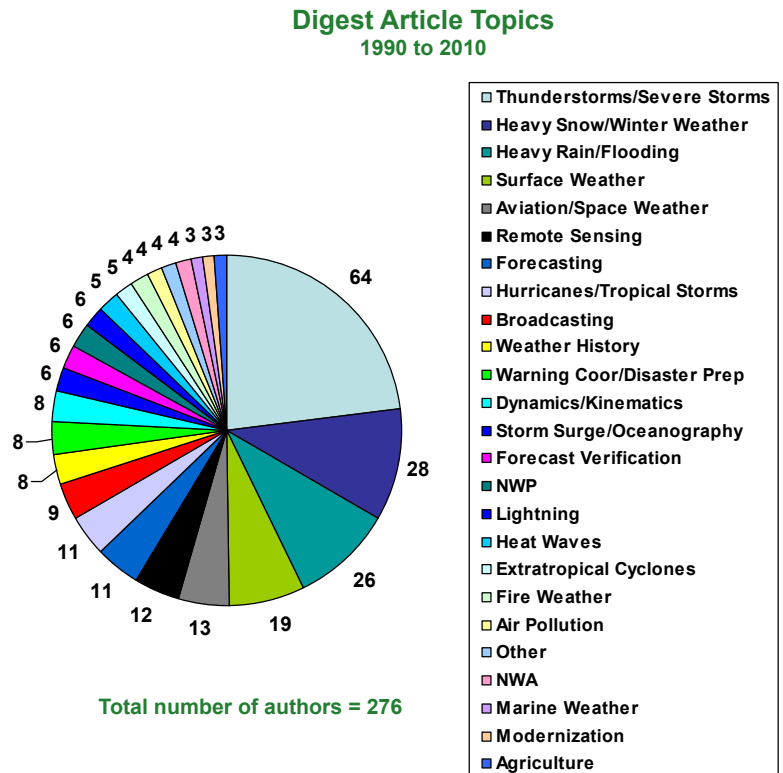
## 2. Data and methods

The data used in this study were gathered from *The Digest's* table of contents from 1990 – 2010. All research articles, notes, and book reviews were included. The number of articles was 276. These articles were then separated into groupings that centered on demographic information such as; the first author affiliation, first geographic location, first author membership, or gender, and non-demographic information such as; subject matter, article type, and submission rates and trends. Trends were not tested for significance using standard statistical tests nor at standard levels of significance (e.g., Neter et al. 1988) since the time-series was of insufficient length, not tested for normality, and the data sample was too small (i.e. 20 years).

## 3. Publications since 1990

### 3.1 Topics and Types of Articles

An examination of the topics published in *The Digest* from 1990 through 2010 (Fig. 1) demonstrates that a wide array of topics has appeared on the *Digest's* pages.



**Fig. 1.** The frequency of topics for articles published in the *National Weather Digest* from 1990 – 2010. The key shows the color scheme for the topics. The raw number of articles is displayed outside the circle. The topics start with the largest share of articles at the top of the key and at the 12 o'clock position in the pie chart.

The 276 articles could be binned arbitrarily into 25 topics. “Thunderstorms” was the most frequent topic of study, comprising 64 articles (22% of the total). The second and third largest number of topics were “heavy snow/winter weather” (28 – 10%) and “heavy rain/flash flooding” (26 – 9%). This was followed by “surface weather” (19 – 6.5%) as the fourth most prominent topic; and “aviation / space weather” (13 – 4%) in fifth place.

This analysis does reflect a general bias toward operational concerns as these topics are of interest to weather forecasters whose mission is often to protect life and property. These five topics combined encompass a majority of *The Digest* articles (143 - or 52% of all). Interestingly, articles dedicated to weather forecasting and forecast verification combined were less than 7% of all articles (although most articles nevertheless had at least some content pertaining to forecasting). This was somewhat surprising, as the perception of operational meteorology is that of being devoted to the forecasting of weather in general, and thus the process of forecasting and forecast performance could reasonably be considered a topic of interest.

Classifying articles by type rather than topic (Fig. 2) reveals that case studies and the forecasting of individual events make up 61 (22%) and 43 (16%) of the total *Digest* publication since 1990. There were 11 different types of articles (Fig. 2) published in *The Digest*. Overviews, or articles that provide basic information like safety, (36 – 13%), climatological (36 – 13%), and remote sensing (29 – 10.5%) were the third, fourth, and fifth largest topics, respectively. The top five types here represent nearly three-quarters (205 – 74%) of all *Digest* articles. In this analysis one surprising result may be the lack of model and model based studies (12 – 4%) given the explosive use of models in the operational and research communities over the past two decades. Here model based studies refers to articles whose focus is the model, and not using a model as a diagnostic or prognostic tool.

### 3.2 Lead Authors

In analyzing authorship, it was decided that the affiliation and geographic distribution of first authors would be examined as some multi-author papers may cover numerous categories. For affiliation, there were seven classifications, and these are listed on Fig. 3. National Weather Service Forecast Office (NWSFO) personnel were the lead authors on 116 (42%) of all articles, while academia was the second largest group of authors at 81 articles (29.3%). Clearly, academia is a strong complement to the NWSFOs in the overall number of *Digest* publications. Other National Oceanic and Atmospheric Administration (NOAA) personnel

(e.g., regional offices, laboratories) were responsible for 36 (13%) articles appearing in *The Digest*. These three categories make up the large majority (233 - 84%) of all *Digest* publications. This suggests the growing significance of *The Digest* as a forum for professional exchange, an operational publication, and a key resource for education and training in the professional community. Only 5% of *The Digest* publication first authors came from the private sector, including none from the broadcast community over the 20 year period. Although there have been articles devoted to broadcasting issues, these were approximately 4% of all *The Digest* articles. Additionally, an examination of all authors (556) showed that 2% of these were from the broadcast community. The authors recognize publication in peer reviewed publications is not necessarily a prerequisite for advancement in the private

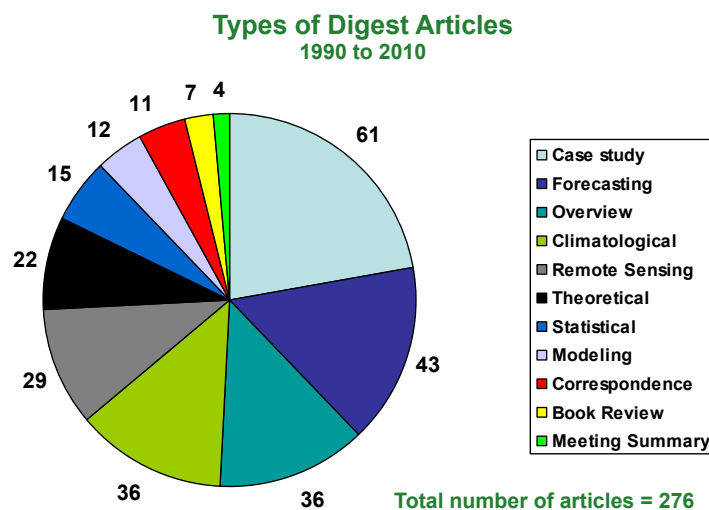


Fig. 2. As in Fig. 1, except for the type of articles.

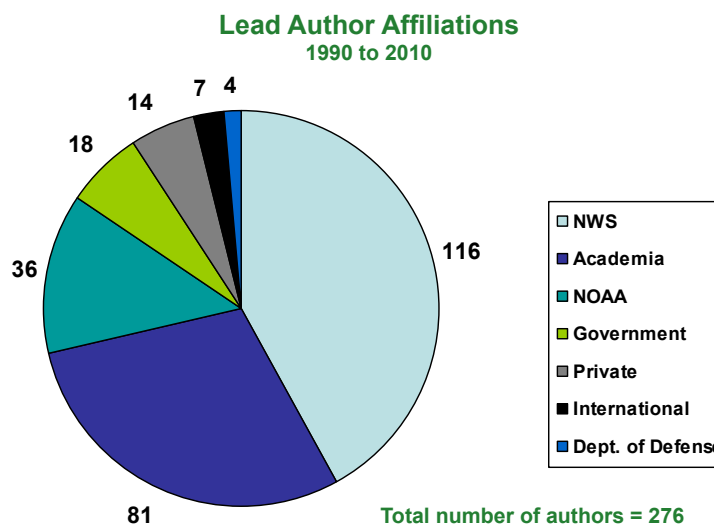


Fig. 3. As in Fig. 1, except for lead author affiliations.

sector; however, one goal of *The Digest* is to make this avenue of publication more appealing to non-academic and non-NWS submissions.

Within the academic community, there were a total of 33 different colleges and universities represented as having researchers who were first author on a paper during 1990 – 2010. Examining the publications by year indicates that there was an upward trend in the number of academic publications (not shown). Also, while there were many different universities represented, 20 of these were institutions with a graduate program, and 13 of them were four-year institutions. Additionally, 15 of these institutions were members (or affiliates) of the University Corporation for Atmospheric Research (UCAR), while 18 were not. From the NWSFOs, there were more than 40 offices represented from 35 states. Four of the top six states were in the NWS Southern Region, while only one state from the NWS Western Region was represented. Additionally, the trend for publications from NWSFOs was down over the 20 year period (not shown).

Examining the geographic distribution of articles (Fig. 4) reveals that most of *The Digest* publications come from the United States, which was then divided into areas that conform to the current NWS Regions. The lead authors were primarily from the Southern (91 – 33%) and Central Regions (88 – 32%), respectively, representing two-thirds of all *Digest* publications. The geographic distribution of phenomena studied (not shown) also closely followed this distribution. This represents a change from the distribution of pre-1990 *Digest* articles which were weighted more toward the Eastern Region (41% - pre-1990), which was the region where the NWA originated.

An examination of the trend in the total number of publications (Fig. 5) demonstrated that over the last 20 years there was a trend toward fewer publications in *The Digest* overall. Much of this decline mirrors declines in the number of NWS and government agency *Digest* publications (not shown). There is some evidence available to suggest that the fall in NWS *Digest* publications and rise in the number of academic publications reflects a tendency for more collaborative research between the two institutions in general. A study of all authors on *Digest* publications (556) demonstrated that the ratio of authors was roughly similar for the NWS (36%) and academia (35%), and a growing number of papers had mixed authorship for these two categories reflecting a growing trend toward partnership. However, the rise in *Digest* academic publications since has not offset the overall decline shown in Fig 5.

### 3.3 Author demographics

In examining the author demographics, we listed all 276 first authors and eliminated those who had multiple publications. Then, the number of unique authors was 200. Of these, 190 (95%) were male and 10 (5%) were female. These ratios are consistent with the findings that the geosciences, in general, have a low ratio of female to male scientists (e.g., see <http://www.ucar.edu>). The ratio of NWA members to non-members was 103 (52%) members to 97 (48%) non-members. Thus, *The Digest* is a publication that draws contributions equally from members and non-members. Lastly, if prolific authors (3 or more articles) were separated out (16), a larger fraction of these were NWA members (13 or 81%), and all were male.

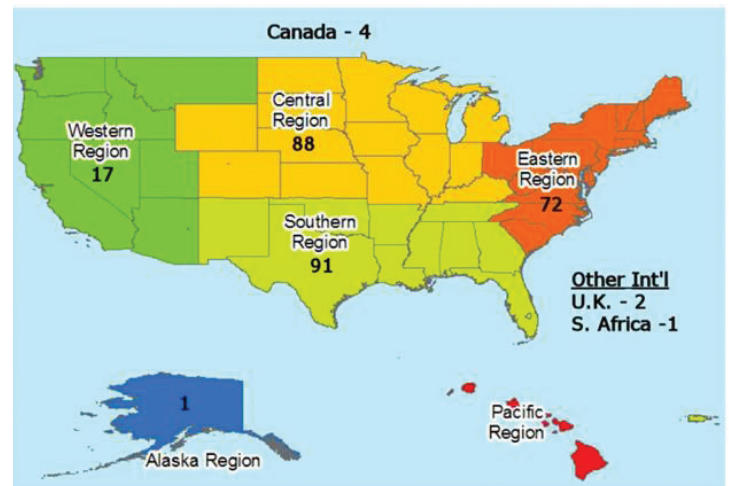


Fig. 4. A map of the United States indicating the current National Weather Service Regions. The numbers correspond to the number of articles originating from that geographic region.

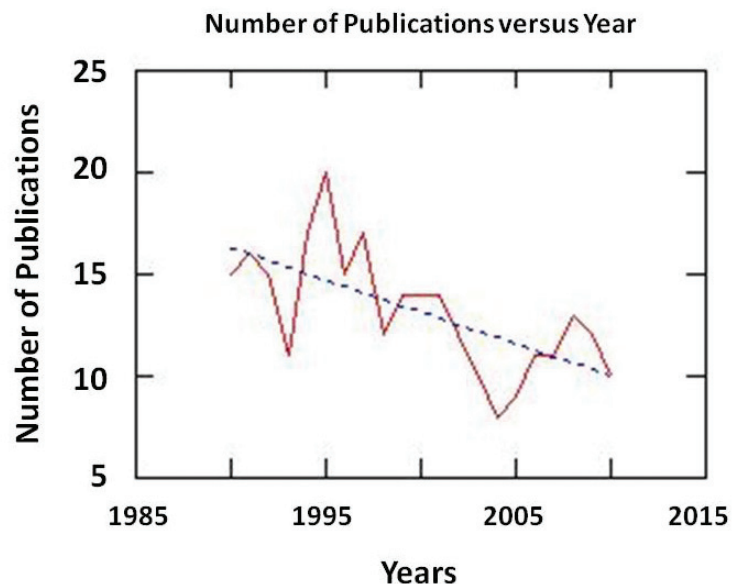


Fig. 5. The number of articles published in the National Weather Digest versus year (red). The blue dashed line is the linear trend line.



An examination of lead author affiliations after accounting for multiple *Digest* publications is shown in Table 1. The numbers here add up to 202 rather than 200 because two authors switched regions during their publishing career. The majority of first authors employed with the NWS, NOAA, the Department of Defense, and the private sector were NWA members, while the majority of those from other governmental agencies, academia, and the international community were not members. The reasons for these distributions were not immediately clear without more extensive surveying. Table 2 shows a regional breakdown of NWA affiliation. In the Eastern, Central and Southern Regions, the majority of first authors were NWA members, while in the other regions, which contributed a smaller fraction of the first-author sample, most were non-members.

Finally, the region and affiliation of first authorship were compared against each other (Table 3) regardless of member status. This information shows that NWS contributions came from all regions of the country, while first authors from the other sectors resided primarily in the Eastern, Central, and Southern Regions. A larger fraction of first authors in academia were from the Eastern and Central regions. This may be due, at least in part, to the fact that a greater share of the universities which have meteorology programs are located in these regions (<http://www.ucar.edu>).

#### 4. Summary and Conclusions

In this paper, a brief study of articles appearing in the *National Weather Digest* from 1990 – 2010 was examined by extracting the data from the table of contents. A total of 276 articles were used and classified by article subject, type, first author location and affiliation, first author demographics, and trends in submission rates and publication rates.

The results demonstrate that while the subject matter tends to be drawn more toward operational issues, the studies tend to be more phenomenological with less emphasis on forecasting. There were also a number of articles that could have been considered in more than one category. Most first authors were male, and there was approximately an equal likelihood of first authors for *Digest* articles to be NWA members as not. However, more prolific first authors tend to be overwhelmingly NWA members. Additionally, *The Digest's* articles are not solely dominated by those in the NWS; academia is a strong partner in *Digest* publications, especially in more recent years. *The Digest* articles tended to come from the Southern and Central Regions over the past 20 years, and this represents a shift from the pre-1990 publication rates which were more strongly connected to the Eastern Region.

	NWS	Academia	NOAA	Government	Private	International	DoD
Membership (Y/N)	52 / 42	22 / 28	18 / 4	5 / 10	6 / 4	0 / 7	3 / 1
Gender (M/F)	90 / 4	46 / 4	21 / 1	15 / 0	10 / 0	6 / 1	4 / 0

**Table 1.** An analysis of first author membership and gender by author affiliation (same as those from Fig. 3).

	Eastern	Central	Southern	Western	Alaska	International	Pacific
Membership (Y/N)	24 / 21	40 / 31	37 / 30	4 / 7	0 / 1	0 / 7	0 / 0
Gender (M/F)	44 / 1	68 / 3	63 / 4	10 / 1	1 / 0	6 / 1	0 / 0

**Table 2.** An analysis of first author membership and gender by NWS Region (same as those from Fig. 4).

	NWS	Academia	NOAA	Government	Private	International	DoD
Eastern	14	13	7	5	4	0	2
Central	33	22	6	6	3	0	1
Southern	37	15	9	4	1	0	1
Western	9	0	0	0	2	0	0
Alaska	1	0	0	0	0	0	0
International	0	0	0	0	0	7	0

**Table 3.** First authors classified by NWS region and affiliation.

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