

PERCEPTION OF WETLAND VALUES IN THE WRITTEN MEDIA

(You are what you read and read what you are)

INTRODUCTION

A contention in environmental issues is that groups follow different paradigms and these paradigms are determined, at least partially, by what they read. Are different values emphasized by different written media? If so, we are what we read and read what we are. Paradigms form the foundation for a society's belief and value system, and are the guiding force behind how we deal with ourselves, family, community, and even the environment. In a sense, they dictate what concerns us. Paradigms can be thought of as sets of cultural lenses, they provide the structure for social learning. When reality changes, as it does, those lenses distort some aspects of reality and may lead observers to completely ignore other aspects. As Americans, we are part of the social paradigm of the culture that makes us Americans and as in all societies we, as a people, join together with those who share our own view and build upon that view based on our view of how our world should be. It also influences how we act and react within the society group as well as what choices we make.

In lieu of this, three questions arise: 1.) Are these actions and reactions, influenced by the social paradigm, reinforced by what we read in the written media? Is what we read based on what paradigm our community as a social unit believes in? In turn, 2.) how is the written media a part of this and how are they, if so, shaped by the paradigm of the reader? If they are shaped, does this limit them and is the quality of content affected? Also, 3.) if we are what we read, and the media is influenced by the same paradigm that makes this so, does this limit the potential for changes in perception and values and thus limit environmental change?

Wetland values issues are the source of much debate and controversy at this time. The purpose of this study is to examine the values cited and how they are presented in five written media categories: (Academic, News, Agency, Trade and Environment) and determine the level of homogeneity or differences that exist.

LITERATURE REVIEW

Communication is shaped by the paradigm that dictates the society in which the communication is taking place. The written media, as a part of this communication process, creates a spiral of information from themselves to the reader which changes and evolves, but still holds the same paradigm theme of the community. This process is a repetitive activity that, along with the other goings on of daily living, maintains our society's state of equilibrium according to its particular paradigm (DeFleur, 1986).

In a sense what we read in the written media reinforces our own and our community's social paradigm. The media serving that community and being a part of it will mirror

those beliefs that the readers hold. An example of this close relationship between the media and the reader and the role of paradigm can be seen in the results of a study undertaken by Julia B. Corbett, in 1992, a doctoral student in communications at the University of Minnesota. She conducted a content analysis of wildlife stories during a nine week period in six Minnesota area newspapers. The goal of the study was to determine "to what extent the newspaper's portrayal of wildlife was a function of the type of community (rural or urban) in which it was reported." She found that the coverage of wildlife issues was written in a tone that reflected the prevailing concerns and values of the surrounding social environment in which the stories are read (Corbett, 1992). Each community perceived the issues according to how they affected such things as the local and dominant industries (Corbett, 1992). These issues were treated accordingly by the written media that served each individual community making it evident that they do play a role in reflecting the social paradigm of the readers. She concluded that perhaps we are what we read since it appears that the information reported to us by the written media is presented in a way that is acceptable to our beliefs.

Therefore, one could wonder, is the written media narrow in its reporting of information since it seems they are only writing what the reader wants to hear, instead of partaking in conveying all information in a scope that may even challenge the social beliefs of the reader. A key point of a paradigm is that input that seemingly goes against it is viewed negatively by the society. This in itself could lead to a narrowness on the part of the written media in reporting information.

What often occurs with new input that is rejected by a paradigm in place is that it is treated as conflictive by the media and conveyed to the reader in that sense. An example can be seen in the way environmental issues are handled in the United States. The Dominant Social Paradigm (DSP) is focused on economic growth and unlimited resources (Dunlap, 1984), but the environmental movement doesn't fit into these dimensions of the DSP. It is viewed as radical by many, or separate from the world of most people because in the media it is portrayed either as disruptive or in a vague content that gives "interesting facts" but doesn't go on to show its connection to improving life or solutions.

Conflictive reporting of environmental issues by the media mirrors the same alarm the public has to this "negative" input to the dominant belief system. It creates an "us against them" story line. One only has to look at this nation's newspapers and their headline of the spotted owl issue (Meadows, 1991) to see the media's tendency to focus on conflict as well as the alarm that the media feels towards ideas that are contrary to DSP (Dunlap, 1984). Meadows (1991), notes that the newspapers ran headlines much like "An Owl Versus An Industry" that, in his view, accepted the industry's exaggerated view of the situation. He points out that jobs are not threatened by the owl but instead by the industry's own labor saving changes, by export policies, and by the over-harvesting of trees (Meadows, 1991). The true headline showing the actual conflict Meadows believes should be stated as "A Forest Versus Greed". This, however, would represent an attack on "the paradigm that pervades everything in the culture, including the media". Ultimately what is

occurring with the information is that the problems are being emphasized instead of solutions, and obstacles outweigh opportunities. The media "systematically unempowers themselves and their audience" (Meadows, 1991).

With all this in mind, what is happening to the environmental perception on the part of the reader who relies on the traditional newspaper as a source of information? We gain our perceptions of our world from daily contact with others and through what we read, among other things. Our perceptions reinforce our paradigm and vice versa. If you allow no alternative view, then little changes. The perception created by the media writing such headlines as "An Owl Versus An Industry" (Meadows, 1991) reinforces the community's view that it is an "us against them" problem with them being the environmental movement. As long as there is nothing else written that intelligently says otherwise, and offers solutions that are beneficial for all parties, then the current paradigm prevails.

One should also wonder if we, as the readers, are receiving quality and accurate information from our media sources with the social paradigm of the community and the nation playing such a pervasive role in setting the tone for what is written. In one study that looked at environmental risk reporting, it was found that the media used scientists and representatives from government and industry as their traditional news sources. These self-serving sources placed great importance in not alarming the public (Salomone, 1990). The tone they tried to set was to reassure the public. It was suggested, at the conclusion of the findings, that this desire to support the social paradigm of the reader is stronger than the journalist's wish to undermine it (Salomone, 1990). As for accuracy in the information reported, analyses show that the tendency to make it more interesting and acceptable "errors of omission, emphasis, or fact" occur in the media report (Singer, 1990). For most people, their source of information is the mass media. What the media chooses to emphasize, omit, or treat as fact when reporting on such issues as environmental risk becomes, once again, a key point in how public perception is shaped (Singer, 1990).

It is expected of journalists to present stories that are accurate, balanced, informative, as well as interesting (Salomone, 1990). Even though it is the goal of the journalist to do so when writing a story, studies like the two mentioned above clearly point out that this is not always so. Social paradigm is a strong reason for this since it appears the written media avoids challenging it. By following the belief system of the community it serves, some written media, in the area of environmental issues, falls short in presenting the issues in an accurate and balanced format. Only those issues that don't disrupt the daily lives of Americans are portrayed. Friedman (1991) makes the comment that today even though there are more stories in the written media on the environment, the quality of their content and coverage has not changed.

The written media portrays and interprets reality that is internalized by the reader, thereby shaping their personal and social behavior (DeFleur, 1986). The way in which the information is interpreted by the media seems to be controlled by the prevailing social paradigm and the resulting attitude towards the information. What we read reflects who we are from an individual level, to a community level,

ultimately to a national level. If the major source of information comes from the traditional media, it is likely the Dominant Social Paradigm (Dunlap, 1984), as discussed earlier, plays a key role in setting the tone for what is written. The traditional media write accordingly so as not to disrupt the prevailing attitudes of the reader who, in turn, receives information that is in line with his or her beliefs creating in a sense a "we are what we read" reality.

METHODS

This study represents a survey written and developed by the Mankato State University Wetlands Class of 1992 on the issue of written media perception of wetland values. It is based on the written media only. Eighteen students reviewed three articles involving wetlands from each of five media categories: (Academic, News, Agency, Trade and Environment) for cited values. Articles were limited to those dealing with the upper Midwest. Value categories used were obtained from the User's handbook for Wetland Values Database. The handbook was created for the U.S. Department of the Interior, Fish and Wildlife Service, National Wetlands Inventory and grouped values into 11 different categories (Stuben, 1984). The class found 1789 values mentioned in 271 printed articles. A descriptive breakdown of the data set was developed to determine the similarities of the parameters related to the written values. Data was then broken down by value for each media category using Microsoft Excel.

RESULTS

Comparison of Descriptive Parameter Sets to Media Categories

Prior to examining differences in media category values, we looked at the breakdown of descriptive parameters utilized in our survey to determine those that could influence our wetland values interpretation (Table I). In reviewing related parameters it is important to realize that the comparisons are not within the media categories but within sets. Differences between the first three geographic sets for different media categories could greatly influence interpretation of different media categories (i.e. pothole vs. lake vs. river location). The last four parameter sets represent emphases, approaches and methods.

When looking at the Cowardin Classification and wetland type there is uniformity for each of the five media categories. The news paradigm stands out within the Location Set with one third of their articles citing urban wetlands.

Within the information source set the academic paradigm shows that 47 percent of the articles are referenced, much higher than the average of 17 percent. Within the news category there is a higher non-referenced, 63 percent, compared to the average of 39 percent, and a lower original and referenced 5 percent for both sets compared to an average of about 15 percent. The agency paradigm fits the norm for the source set. The trade and environment paradigms were quite similar with a higher percentage for the implied, 39 percent compared the 29 percent average, and a lower percent for referenced, 3 compared to 17 percent average. For the environment paradigm there

Table I. Breakdown of descriptive parameters sets related to wetland values by written media

Media Category	Number of Articles Reviewed	Total Values Cited	Cowardin Classification			Wetland Type			Location		Source			Determination		Model			Policy				
			Palustrine	Lacustrine	Riverine	Natural	Constructed	Restored	Urban	Rural	Implied	Original	Referenced	Non Referenced	Qualitative	Quantitative	Replacement	Scaling & Weighing	Common Denominator	Other	Legislation	Regulation	Management
1. Academic	60	186	47	24	29	88	5	7	9	91	16	23	47	15	41	59	14	19	22	45	31	20	49
2. News	49	120	45	27	28	77	16	7	35	65	27	5	5	63	82	18	20	0	20	60	40	43	17
3. Agency	62	197	42	28	29	78	8	14	13	87	27	17	14	42	52	48	20	14	16	49	27	16	57
4. Trade	53	142	43	26	31	67	10	23	18	82	39	16	3	42	85	15	18	0	35	47	42	25	33
5. Environment	47	144	47	24	29	78	12	10	25	75	40	9	6	45	72	28	13	7	30	50	32	19	49
Total # Breakdown	271	789	668	393	437	698	85	112	148	633	280	145	166	380	256	156	45	27	64	129	149	111	178
Total % by Set			45	26	29	78	9	13	19	81	29	15	17	39	62	38	17	10	24	48	34	25	41
Total # by Set					1498			895		781				971		412				269			438

was again a higher percent in the implied about 40, compared to an average of 29 percent and lower original and referenced sets.

There is a lack of homogeneity in the determination set (qualitative vs. quantitative) among the five paradigms. Academic and agency were both high and news and trade were low for quantification.

When looking at the model utilized set once again there was no uniformity. The common denominator was highest in trade and environment with replacement highest in agency.

The replacement model involves the cost of replacing the various services performed by a wetland. This is a conventional economist's model. The shortcoming is that it is difficult putting a value on many services.

Scaling and weighting models involves making a list of all values that apply to a wetland in question and then assigning a value of "1" to each. This is followed by factoring in multipliers of the relationship of the individual values to their maximum of 1. For example, potential versus actual ducks/acre. Then weigh each factor in proportion to its relative importance, i.e. value 2 is 10 times more important than value 1, then multiply value 2 by 10. This process is similar to the Environmental Impact Statement matrix approach.

The Common Denominator Model is a strict economic approach of net willingness to pay. This approach to monetize wetland values generally emphasizes commercial aspects (fish, waterfowl, recreation) but ignore global level life support functions.

Finally, when looking at the policy addressed set there is once again a lack of homogeneity. Highest percentages are seen in management for agency, academic, and environment paradigms with news paradigm highest in regulation and trade highest in legislation.

The overall data population shows a fair degree of homogeneity for the classification, type, and location sets, with the only exception being the larger emphasis on urban within the news paradigm. These three sets represent the critical sets for assuring us that we are comparing similar wetlands by our five media categories. The last four sets represent differences in emphases, approaches, and methods, which need to be examined and support the hypothesis that the written media has different paradigms when it comes to wetlands.

Academic Category

In the academic media 186 values were cited from 60 articles (Table I). The academic media emphasized four major values (Figure 3). Use, habitat, water quality, and hydrologic values were all mentioned in approximately one-half of the

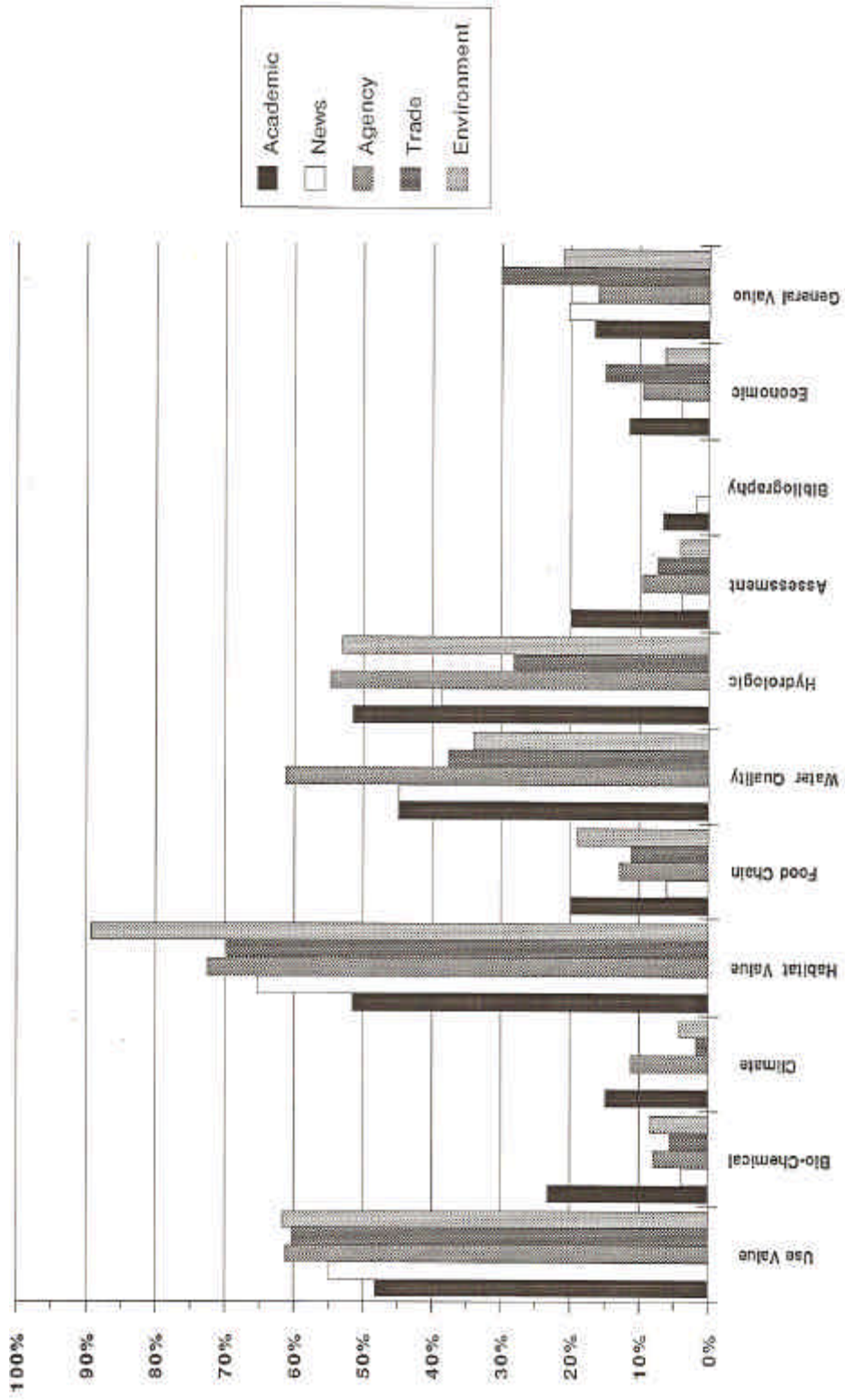


Figure 3. Percent of articles citing specific values by media category

60 academic articles reviewed. The five academic media value categories of biochemical processes, climate, food chain, assessment techniques, and bibliography had the highest percentages of value citations per article of all five media categories.

The values use, habitat and hydrologic each represent over 15 percent of the values cited by the academic category (Figure 4).

The natural, rural, palustrine wetlands were the dominant wetlands cited (Table I). Within the academic media there is a large amount of value citation (186), second only to the agency category. The sources of information for the articles reviewed for the academic media were referenced 47 percent of the time. Forty one percent were qualitative and 59 percent were quantitative. The common denominator was the most frequently cited specific type in the modeling set although all modeling methods were quite evenly distributed. Policy focused on management of wetlands one-half of the time.

When looking at the specific values within the parameter sets the following key relationships are seen (Table II):

- Referenced citations are highest in all 11 value category
- Quantitative determination is dominant in all but food chain and hydrologic values.
- Common denominator is the dominant model used, although models are seldom sited (69).
- Within the policy parameter set management is the dominant policy type sited in all but water quality and hydrology. Further, policy represents the least sited of all 11 parameter sets (54).

News Category

In the news media 49 papers were reviewed with 120 values cited (Table I). Use and habitat values were cited in over 50 percent of the 49 papers (Figure 3). Habitat value represented over 25 percent, use over 20 percent, and water quality and hydrologic each represented over 15 percent of the values cited by the news category (Figure 4).

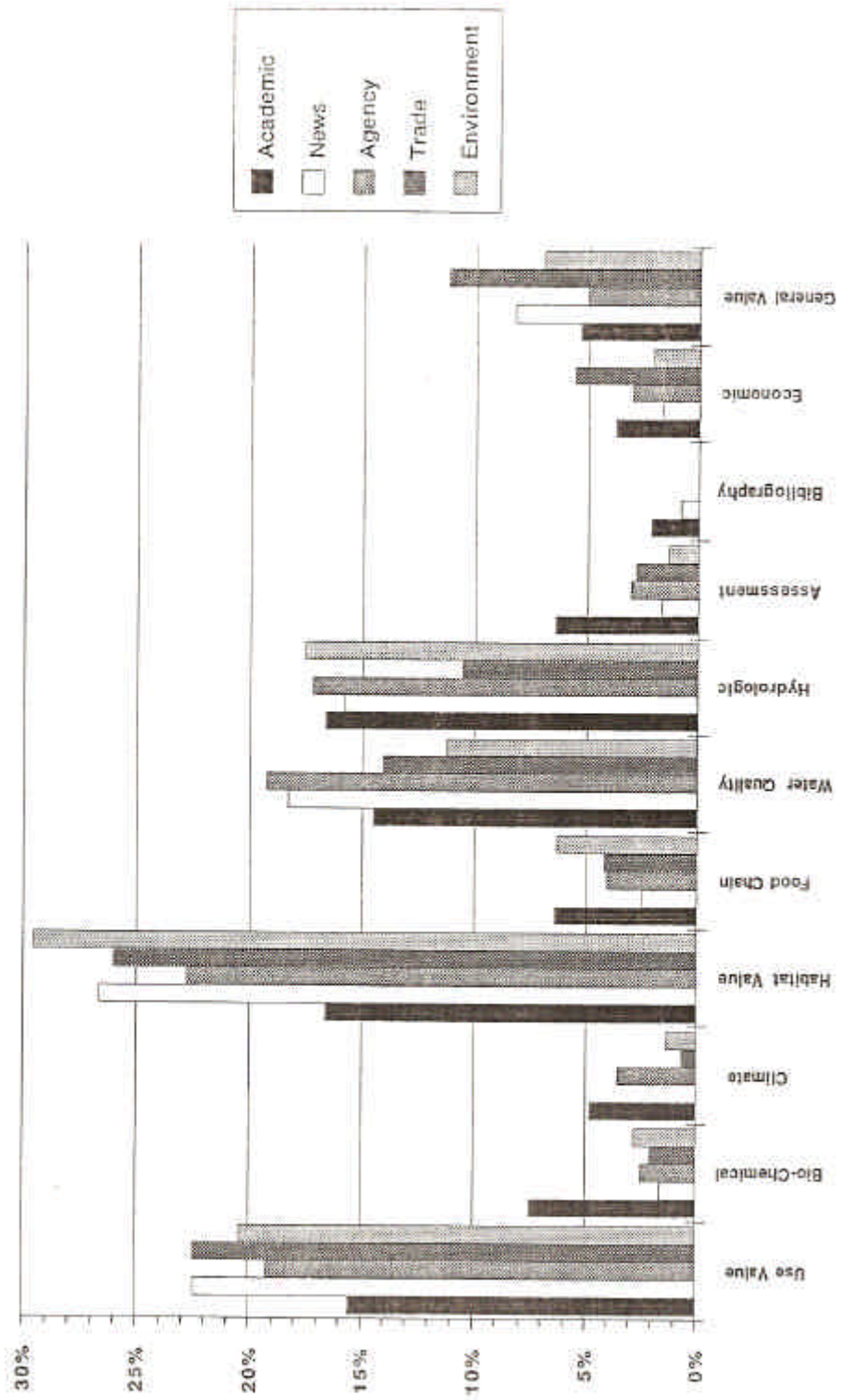


Figure 4. Percent of values cited by media category

Table II. Academic media breakdown of values citations by descriptive parameter sets

Values	Cowardin Classification			Wetland Type			Location		Source			Determination		Model			Policy				
	Palustrine	Lacustrine	Riverine	Natural	Constructed	Restored	Urban	Rural	Implied	Original	Referenced	Non Referenced	Qualitative	Quantitative	Other	Scaling & Weighing	Common Denominator	Replacement	Legislation	Regulation	Management
1. Use Value	24	16	16	27	2	4	7	23	13	8	17	6	5	11	8	4	2	—	4	4	9
2. Biochemical Processes	13	5	6	13	1	—	—	9	2	2	12	—	5	5	—	—	—	—	—	—	2
3. Climate	7	5	5	8	—	1	1	7	2	4	4	—	2	4	2	—	—	1	—	—	1
4. Habitat Value	24	11	13	29	1	1	1	28	5	9	16	10	7	13	7	2	3	2	3	2	5
5. Food Chain	9	4	5	11	1	—	—	11	3	3	8	2	5	2	1	1	1	—	—	—	3
6. Water Quality	19	10	15	25	2	1	3	24	1	8	15	6	10	11	3	2	2	3	3	—	2
7. Hydrologic Values	28	13	15	29	1	3	2	25	6	9	16	7	9	8	2	—	2	2	4	3	—
8. Assessment Techniques	11	3	3	10	—	2	—	12	1	6	9	1	—	8	1	2	—	—	—	—	1
9. Bibliography	4	1	1	3	—	1	—	4	—	—	4	—	1	1	—	—	—	—	—	—	—
10. Economic Models	4	4	5	7	—	—	—	6	—	4	7	—	1	2	4	1	3	1	—	1	2
11. General Value	6	6	8	10	1	1	2	7	4	1	4	3	1	2	3	1	2	1	3	1	1
Total # Breakdown	149	78	92	172	9	14	16	156	37	54	112	35	46	67	31	13	15	10	17	11	26
Total % by Set	—	47	24	29	88	5	7	9	16	23	47	15	41	59	45	19	22	14	31	20	49
Total # by Set	—	—	319	—	—	195	—	172	—	—	—	238	—	113	—	—	69	—	—	—	54

The dominant type of wetland cited was the palustrine and natural type with a rural location (Table I). Sources were non-referenced in 63 percent of the papers reviewed, and implied sources were cited in one-fourth of the papers. Original and referenced sources were only cited 5 percent of the time. Wetland value determination was primarily qualitative (82 percent). In the model category the common denominator model and replacement model types are each seen in one-fifth of the cases, however their overall numbers are very small. Legislation and regulation were both cited equally in the policy set at about 40 percent of the articles (Table I).

When looking at the specific values sited within the parameter sets the following key relationships are seen (Table III):

- Non-referenced sources are the highest or tied with implied in all value categories (93 out of 146) with implied adding 40 for a total of 90%).
- Qualitative determination is dominant and often the only determination in all values (51 of 62 or 82 percent).
- Model citations are rare.
- Within the policy parameter set, legislation and regulation each account for approximately two-fifths of the values sited.

Agency Category

In the agency media 62 papers were reviewed with 197 values cited (Table I). Over one-half of the articles cited use value, habitat, water quality, and hydrologic values (at 61, 72, 61, and 55 percent respectively (Figure 3). Together these values represent over three-fourths of the total values cited (Figure 4). Water quality and hydrology values were higher than the other four categories in percent of articles citing these values. Within the water quality value category the agency media had the largest percent of total values for all five categories, but was followed closely by news (Figure 4).

Agency media categories had the largest number of value citations of all 5 categories (Table I). Palustrine, natural, and rural were the dominant wetlands types cited, which was similar to the other media categories. The sources of information in the articles reviewed were non-referenced (42 percent) and implied (27 percent). There was an almost even split between qualitative and quantitative in the determination set which was unique among the media paradigms. Replacement was uniquely the predominant model used. Management was very dominant in the policy set at 57 percent followed by legislation at 27 percent.

Table III. News media breakdown of value citations by descriptive parameter sets

Values	Cowardin Classification			Wetland Type			Location		Source			Determination		Model			Policy				
	Paulistyne	Lacustrine	Riverine	Natural	Constructed	Restored	Urban	Rural	Implied	Original	Referenced	Non Referenced	Qualitative	Quantitative	Other	Scaling & Weighing	Common Denominator	Replacement	Legislation	Regulation	Management
1. Use Value	22	13	14	27	5	3	12	18	14	3	—	18	10	2	3	—	—	1	10	12	5
2. Biochemical Processes	2	1	1	2	—	—	—	—	1	—	—	1	2	—	—	—	—	—	1	1	—
3. Climate	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4. Habitat Value	32	29	15	14	3	3	10	22	8	1	1	27	12	4	3	—	—	2	8	8	4
5. Food Chain	3	3	2	2	—	1	1	2	—	1	1	2	2	—	—	—	—	—	1	1	—
6. Water Quality	22	20	13	21	2	1	6	17	5	1	3	17	10	2	1	—	—	1	7	9	4
7. Hydrologic Values	19	17	12	14	1	—	6	12	4	—	—	17	8	3	1	—	—	1	7	8	2
8. Assessment Techniques	2	2	1	2	1	—	1	1	1	—	—	2	2	—	1	—	—	1	2	—	1
9. Bibliography	1	1	1	1	—	—	1	1	1	—	—	1	1	—	1	—	—	1	1	—	—
10. Economic Models	2	2	1	2	—	—	1	1	2	—	—	2	2	—	2	—	—	1	1	1	—
11. General Value	10	8	5	6	11	3	6	5	4	1	1	6	2	—	1	—	—	1	4	6	2
Total # Breakdown	120	106	64	111	23	11	44	80	40	7	6	93	51	11	13	0	4	5	42	46	18
Total % by Set	45	27	28	77	16	7	35	65	27	5	5	63	82	18	60	0	20	20	40	43	17
Total # by Set			237		145		124					146		62				22			106

When looking at the specific values within the parameter sets the following key relationships are seen (Table IV):

- Non-referenced citations are highest in all except climate biochemical processes and assessment techniques. Non-referenced and implied account for two-thirds of the citations.
- Qualitative determination is dominant in six of the value types, but only by a minimal difference.
- The three modeling types are evenly distributed and as a parameter set are the lowest cited.
- Within the policy set management is highest, often significantly, in all but economic models.

Trade Category

The trade media cited 142 values in 53 articles (Table I). Use and habitat values were mentioned in over 60 percent of the trade articles (Figure 3). The values of use and habitat each represent over 20 percent of the total values cited by the trade category (Figure 4). Water quality, hydrologic, and general were each cited in approximately 30 percent of the articles (Figure 3). Further, these three values represent nearly 40 percent of all values cited in trade media (Figure 4). Both Figures 3 and 4 show that the trade media has the highest percentage of values in the economic and general category, more than any other media.

Forty three percent of the wetland citations were palustrine, 67 percent natural and 80 percent rural. However, the trade media category had the highest restored wetland coverage of all media categories (Table I). Approximately four-fifths of the values were provided through implied or non referenced sources. Eighty-five percent of the values were determined by qualitative rather than quantitative measurements. Models were predominantly the common denominator type. Legislative policy was mentioned more frequently than regulation or management, the only media category where this was the case (Table I).

When looking at specific values within the parameter sets, the following key relationships were seen (Table V):

- Non-reference or implied were highest in most value categories, with the exception of economic models and assessment techniques.

Table IV. Agency media breakdown of value citations by descriptive parameter sets

Values	Cowardin Classification			Wetland Type		Location		Source			Determination		Model			Policy						
	Pauustrine	Lacustrine	Riverine	Natural	Constructed	Restored	Urban	Rural	Implied	Original	Referenced	Non Referenced	Qualitative	Quantitative	Other	Scaling & Weighing	Common Denominator	Replacement	Legislation	Regulation	Management	
1. Use Value	35	24	25	35	4	7	7	30	14	8	6	22	12	10	6	4	2	1	9	9	19	
2. Biochemical Processes	5	5	1	3	1	1	—	4	2	1	1	1	2	1	2	—	—	1	1	—	1	
3. Climate	7	6	6	7	—	—	—	4	4	1	1	2	1	1	—	—	—	—	1	—	1	
4. Habitat Value	42	25	26	37	4	11	2	42	14	8	7	23	12	7	5	2	2	4	8	3	18	
5. Food Chain	8	5	5	7	1	3	—	6	2	2	1	3	2	1	2	—	1	—	—	—	1	
6. Water Quality	35	22	23	33	4	5	5	31	14	9	6	17	11	9	6	2	2	3	3	3	14	
7. Hydrologic Values	30	21	22	32	—	3	5	28	9	4	6	21	8	7	6	1	2	2	6	4	11	
8. Assessment Techniques	6	6	6	6	1	1	1	4	1	2	2	1	—	2	1	1	—	—	—	—	3	
9. Bibliography	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
10. Economic Models	6	5	4	5	1	1	—	5	2	3	1	4	—	5	3	—	2	1	3	—	2	
11. General Value	10	10	9	10	1	1	4	7	2	2	1	5	2	3	2	—	—	2	3	2	3	
Total # Breakdown	183	123	128	175	17	33	24	161	64	40	32	99	50	46	34	10	11	14	34	21	73	
Total % by Set	42	28	29	78	8	14	13	87	27	17	14	42	52	45	49	14	16	20	27	16	57	
Total # by Set			434			225		185				235		66				69				128

Table V. Trade media breakdown of value citations by descriptive parameter sets

Values	Cowardin Classification			Wetland Type			Location		Source			Determination		Model			Policy					
	Paulistyne	Lacustrine	Riverine	Natural	Constructed	Restored	Urban	Rural	Implied	Original	Referenced	Non Referenced	Qualitative	Quantitative	Other	Scaling & Weighing	Common Denominator	Replacement	Legislation	Regulation	Management	
1. Use Value	32	26	14	13	25	2	9	4	30	14	8	19	9	--	7	4	3	10	9	9	9	
2. Biochemical Processes	3	2	--	1	2	1	--	2	2	2	1	1	1	--	--	--	--	--	--	--	--	
3. Climate	1	--	--	1	1	--	--	--	1	1	--	1	1	--	--	--	--	--	--	--	--	
4. Habitat Value	37	29	15	18	24	6	11	7	32	13	10	18	15	2	4	2	3	8	3	3	9	
5. Food Chain	6	4	3	3	6	--	--	1	5	5	--	2	3	--	1	1	--	--	--	--	--	
6. Water Quality	20	15	10	14	12	3	6	4	15	11	1	10	6	1	3	3	--	2	1	1	1	
7. Hydrologic Values	15	11	7	10	12	1	4	3	13	9	--	6	3	1	1	1	--	2	2	2	2	
8. Assessment Techniques	4	4	3	3	4	--	--	2	4	1	--	2	1	2	--	--	--	--	--	--	--	
9. Bibliography	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
10. Economic Models	8	4	--	1	7	1	5	1	8	2	5	5	1	2	5	4	2	4	3	3	3	
11. General Value	16	8	11	9	12	2	1	2	11	9	2	1	9	10	2	2	1	6	4	3	3	
Total # Breakdown	142	103	63	73	105	16	36	26	121	67	27	6	72	50	23	0	17	9	34	20	27	
Total % by Set		43	26	31	67	10	23	18	82	39	16	3	42	85	15	47	0	35	18	42	25	33
Total # by Set				239			157		147			172		59			49					81

- Qualitative determination was highest in all value categories, except economic models and assessment techniques. Further, the qualitative determinations were usually significantly higher.
- Common denominator was the most cited model but there were minimal models cited overall.
- Within the policy parameter, legislation was most cited in all but habitat value. However, the distribution of citations within the three policy parameters was fairly uniform.

Environmental Category

In the environment media, 144 values were cited in 47 articles reviewed (Table I). Environmental media showed a significant emphasis in habitat value with inclusion in almost 90 percent of the articles (Figure 3). Further, habitat represented 29 percent of the total values cited (Figure 4). Use and hydrologic values were each cited in over one half of the articles (Figure 3). These two values contained 38 percent of all the values mentioned in this media (Figure 4). Within the environment category habitat and hydrologic percent of values cited were the highest for all the media categories.

Approximately one half of the value addressed palustrine while three fourths addressed natural and rural wetlands (Table I). Of the 144 values, cited only 6 percent were referenced forty five percent of the values were from non referenced sources and 40 percent from implied. Qualitative determination of wetlands occurred in 72 percent of the articles. Modeling was the least cited with common denominator significantly higher than replacement or scaling and weighting. Nearly one half of the policies section focused on management practices with legislation at 32 percent and regulation at 19 (Table I).

When looking at the specific values within the parameter sets the following key relationships are seen (Table VI):

- Non-referenced citations were highest in the use, habitat, and water quality values. Implied citations were highest in climate, food chain, hydrologic, and general. Together the non-referenced and implied accounted for 85 percent of the citations.
- Qualitative determinations were highest in all but economic models and were usually significantly higher.
- Common denominator was the predominant model used. However, modeling was minimally cited in the environmental articles.

Table VI. Environmental media breakdown of value citations by descriptive parameter sets

Values	Cowardin Classification			Wetland Type		Location		Source			Determination		Model			Policy					
	Palustrine	Lacustrine	Riverine	Natural	Constructed	Restored	Urban	Rural	Implied	Original	Referenced	Non Referenced	Qualitative	Quantitative	Other	Scaling & Weighing	Common Denominator	Replacement	Legislation	Regulation	Management
1. Use Value	26	13	17	26	6	4	9	23	15	3	2	20	13	3	7	1	5	1	7	8	9
2. Biochemical Processes	4	2	1	3	1	—	2	3	2	—	1	2	2	2	2	1	1	—	—	—	2
3. Climate	2	—	—	2	—	—	1	1	1	—	—	—	—	—	—	—	—	—	—	—	—
4. Habitat Value	42	39	21	37	6	4	9	32	19	8	1	27	18	8	6	2	3	1	8	4	11
5. Food Chain	9	8	3	9	—	1	1	6	6	—	—	3	5	2	1	—	1	—	1	1	—
6. Water Quality	16	15	9	14	1	2	5	14	8	1	2	10	4	1	3	—	3	—	1	—	5
7. Hydrologic Values	25	20	13	32	2	3	4	21	15	3	1	14	9	4	4	—	4	—	2	2	6
8. Assessment Techniques	4	2	1	2	2	2	2	2	—	1	1	—	2	—	1	—	—	1	—	—	—
9. Bibliography	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
10. Economic Models	3	3	1	2	2	1	3	2	—	1	2	—	1	2	2	—	—	2	—	—	—
11. General Value	10	9	5	8	1	1	2	9	6	—	—	5	5	1	2	—	—	2	3	—	1
Total# Breakdown	144	127	65	77	135	20	38	115	72	17	10	81	59	23	28	4	17	7	22	13	34
Total % by Set	47	24	29	78	12	10	25	75	40	9	6	45	72	28	50	7	30	13	32	19	49
Total # by Set	269			173		152		180			82		56			69					

- Within the policy parameter set management was dominant in five out of seven value categories cited (use, biochemical processes, habitat, water quality, and hydrologic). Regulation was not dominant in any of the value categories.

Comparison of Values: Numbers and Co-Occurrence

Number of values cited per article

Only 57 (21) percent of the 271 articles reviewed cited a single value (Figures 5 and 6). The largest number of articles cited two values (24 percent) with an almost linear drop off to a maximum of eight values cited. Further, the two values cited category had a very even distribution among all five media categories. The academic and agency media categories increased relatively in percentage with increasing number of values cited (Figure 6). News dropped out the earliest but is dominant in the three value cited category.

Matrix of co-occurring value comparisons

Certain values were found to co-occur at higher levels than others and the co-occurrence fell into three groups (Figure 7). Co-occurrence among hydrologic, habitat, use, and water quality ranged from 43 to 30 percent of total percent of articles. The second group, ranging from 13 to 3 percent of the total articles, involved biochemical, food chain, general values, climate, economic, and assessment. Finally the second group against itself with the addition of bibliography formed a third group and ranged from 0 to 3 percent of total articles.

The percentage of articles by individual media category generally follows the percent of total articles. Group 1 (total articles ranging from 43 to 30 percent) range from 62 to 19 percent in the breakdown. Group 2 (total articles 13 to 3 percent) ranges from 19 to 0 percent in the breakdown. Group 3 (total articles range from 6 to 0 percent) ranges from 8 to 0 percent in the breakdown. It is also clear that there is a relation, in the matrix, to the number of specific values cited.

SUMMARY

Two overall questions were addressed in this section:

- Are there differences in descriptive parameters utilized relating to different written media categories? If this is the case then the written media represents multiple paradigms rather than a single one. Further, does this involve different types of wetlands emphasized by media types and/or differences in approach, emphasis, and methods utilized?

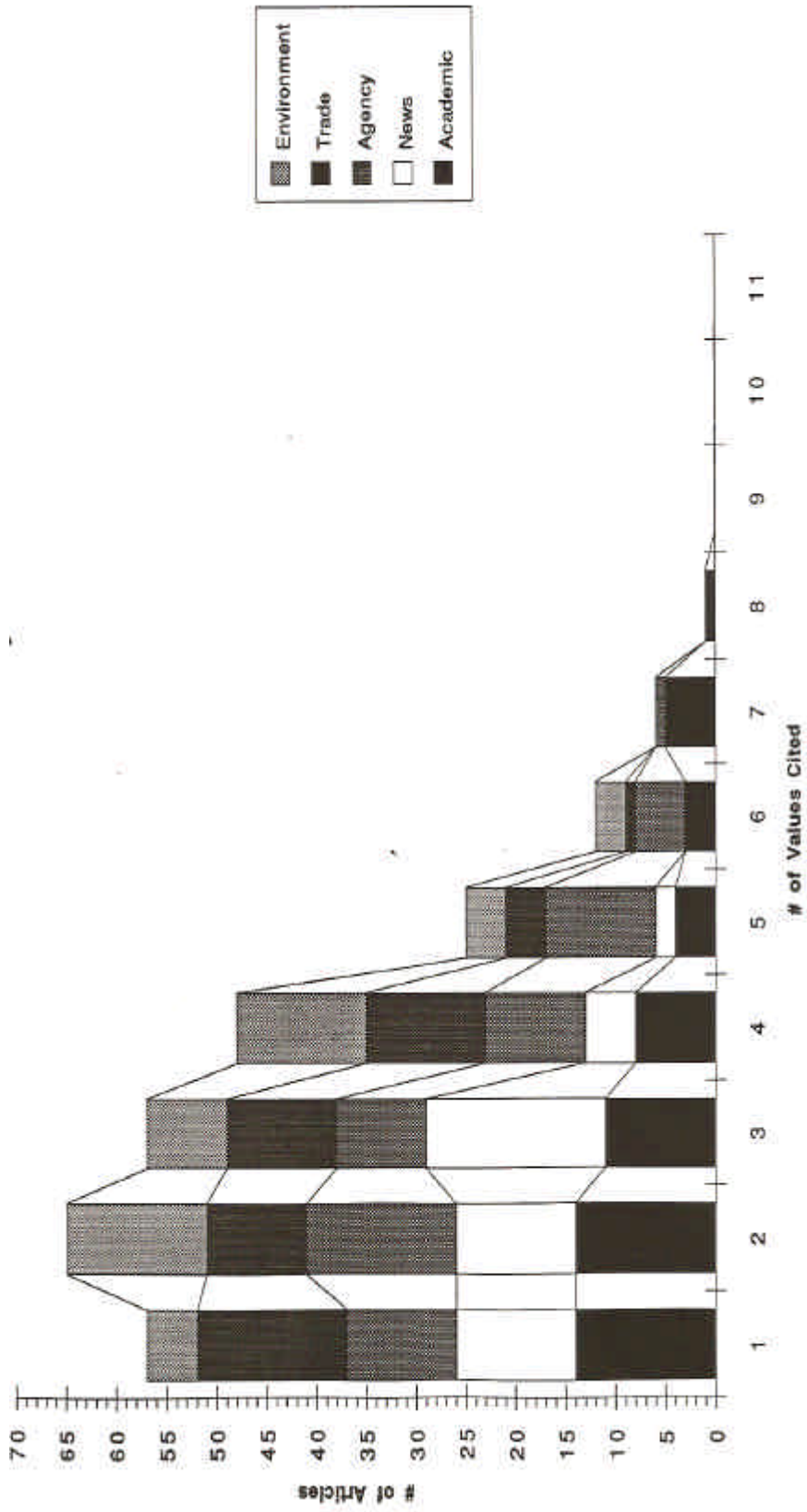


Figure 5. Number of values cited by article

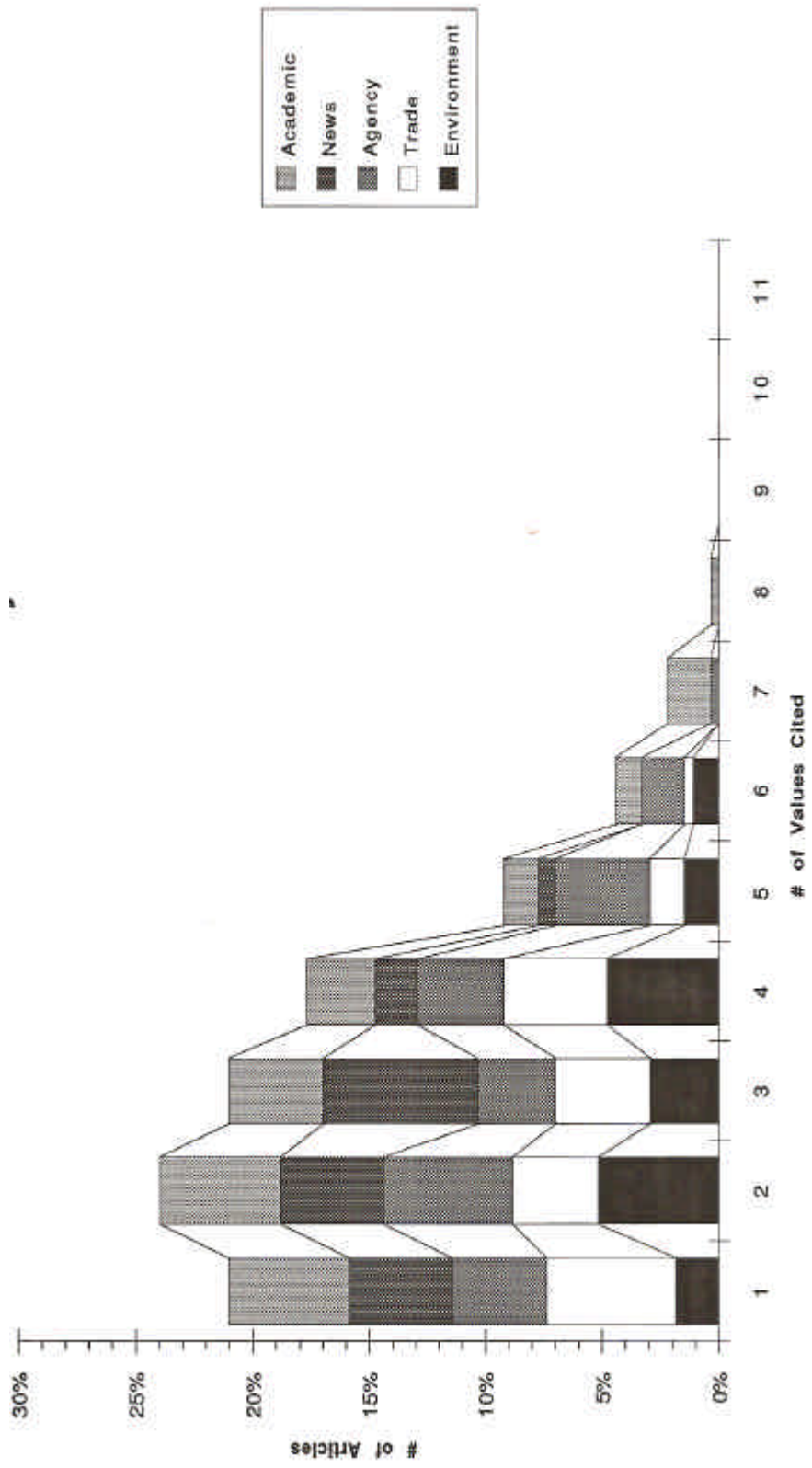


Figure 6. Percent of values cited by article

	Hydro- ge 7	Habitat Value 4	Use Value 1	Water Quality 6	Bio- Chemical 2	Food Chain 3	General Value 11	Climate 3	Economic 10	Assess- ment 8	Bibli- ography 5
Hydro- ge 7	1%										
Habitat Value 4	34%	5%									
Use Value 1	3%	45%	5%								
Water Quality 6	3%	38%	30%	1%							
Bio- Chemical 2	0%	7%	4%	3%	1%						
Food Chain 3	10%	13%	7%	3%	4%	0%					
General Value 11	27%	18%	9%	5%	2%	3%	0%				
Climate 3	3%	5%	5%	3%	2%	2%	1%	0%			
Economic 10	8%	7%	7%	4%	3%	1%	2%	1%			
Assess- ment 8	1%	1%	1%	1%	0.37%	0.37%	0%	1%			
Bibli- ography 5	3%	3%	3%	3%	2%	2%	2%	2%			

of Articles Reviewed

Total Articles	271
Academic	60
News	49
Agency	60
Trade	63
Environment	47

KEY

12%

3 0 8 1 0 4

-----Percentage of total articles
3|0|8|1|0|4
Percentage of articles by individual media category
in the order: Academic, News, Agency, Trade, Environment

Figure 7. Percent Value to Value Comparison by Total and Media Comparison

- Are different values for wetlands emphasized by different written media categories? If this is the case than the written media represents multiple paradigms rather than a single one.

The answer to the first question, from the context of our study, indicates that we are exposed, in the written media, to different approaches, emphases, and methods regarding wetlands. It should be noted that our data indicates that the written media categories are homogeneous in their emphasis on the geographically controlled parameter sets of Cowardin classification, wetland type, and location (Table I). This is an important first cut in that it eliminates type and location as a basis for creating separate paradigms.

However, the last four descriptive parameter sets examined deal more with approach, emphasis, and methods used in examining wetland values by the written media. Under the source parameter set, academic stands out with 47 percent referenced and 23 percent original for a total of a 70 percent. All four other media categories are dominated by combined non-referenced and implied (ranging from 90 to 69 percent). Within the determination parameter set academic at 59 percent and agency at 48 percent are at the high end of the quantified spectrum while trade (15 percent) and news (18 percent) are at the low end. Within the use of models, agency media is unique with its emphasis on replacement whereas the other four emphasize common denominator. The policy parameter breakdown has academic, agency, and environment, all emphasizing management, trade emphasizing legislation, and news emphasizing regulation and legislation.

It is seen in this survey that there are differences in emphasis, approach, and methods utilized by the media categories. These differences impact the credibility (source, determination, model) as well as the emphasis (policy) of each media category and therefore constitute media paradigms based on these differences.

The second question asks whether different values for wetlands are emphasized by different media categories. Addressing this question by percent of articles citing specific values by media category (Figure 3), the academic media is dominant in biochemical, climate, food chain, assessment, and bibliography; all of which are minor values when looking at the total of 787 values cited. The news category shows no dominance in any of the 11 categories; agency is dominant in water quality, hydrologic, and use value (tied with environment); trade is dominant in economic and general value; environment is dominant in habitat value (the overall dominant value) and use value (tied with agency). These findings also support the media categories being classified as paradigms.

The answers to the above two questions have resulted in the conclusion that the written media, in regard to wetland values, does fall into definable paradigms. It is important to understand that these are not statistically generated and are subjective.

- Academic Paradigm

The academic paradigm can be characterized by a dominant level of referenced and original sources and use of quantitative procedures in determining values (unique to the five media categories). This paradigm is almost identical to the environmental paradigm regarding policy legislation 31 percent, regulation 20 percent, management 49 percent. Further, this paradigm had the highest value citations per article of the value categories bio-chemical processes, climate, food chain, assessment techniques, and bibliography, none of which were cited often.

- News Paradigm

The news paradigm can be characterized as having the most non referenced and combined non referenced and implied citations in regard to source. Eighty two percent of the citations were qualitative. The news paradigm was the only one to emphasize regulation (43 percent) from the policy perspective. In relation to values cited, this paradigm was not dominant for any of the values and generally fell in the middle range.

- Agency Paradigm

The agency paradigm is characterized by non-referenced and implied regarding source citation, evenly split between qualitative and quantitative, unique in being dominant in the use of the replacement model, and emphasized and was dominant for all paradigms in management for the policy set (57 percent). Water quality and hydrology were higher than the other four paradigms in percent of articles citing these values and within the water quality value category it had the largest percent of total values followed closely by news.

- Trade Paradigm

The trade paradigm had the highest restored wetland coverage of all media paradigms. Eighty one percent of the sources cited were non-referenced or implied and 85 percent of the values were determined by qualitative means. Legislative policy was cited more frequently than regulation or management, the only paradigm where this was the case. This paradigm had the highest percentage of values in the economic and general value categories of all five.

- Environmental Paradigm

The environment paradigm had 85 percent of its citations non-referenced or implied for sources and they were predominantly qualitative (72 percent). It was similar to academic and agency in emphasizing management. This paradigm

showed a significant emphasis on habitat value with almost 90 percent of the articles citing habitat value. From the perspective of values cited by media category, both habitat and hydrologic were highest in the environment paradigm for all media paradigms.