IS ASFA SUFFICIENT? THE ROLE OF INEXPENSIVE MULTIDISCIPLINARY DATABASES IN THE MARINE SCIENCE INFORMATION CENTER

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ABSTRACT: The use of two inexpensive multidisciplinary databases, UnCover (Knight-Ridder) and Current Contents on Disc (ISI), as complements or alternatives to a core marine science database, Aquatic Sciences and Fisheries Abstracts (Cambridge Scientific Abstracts), was investigated. Database comparison methods such as journal coverage comparison, subject profile searches, and known-item searches were utilized to ascertain scope, uniqueness and currency of each database. Results suggest that the use of multidisciplinary databases such as these as complements to a subject-specific database will significantly improve the recall and currency of retrieved citations.

INTRODUCTION

The field of marine science spans a wide range of scientific disciplines resulting in a diverse body of literature. This is exemplified by the extraordinary number of commercial databases (50) indexing marine science publications (Chavan 1993). This inherent diversity precludes the use of a single, all encompassing database for all searching needs. The rising costs of commercial databases compound the problem by prohibiting the use of an exhaustive array of databases. Such a predicament compels a searcher (librarian or end-user) to find the right combination of databases with limited resources. This dilemma provides the impetus for conducting comparative database studies. Including techniques common in traditional comparative database studies (journal coverage, uniqueness, and currency), this paper examines the use of two inexpensive multidisciplinary databases as complements or supplements to the key marine science database, Aquatic Sciences and Fisheries Abstracts (ASFA).

Described by Filippi (1996) as the best bibliographic database in marine science, ASFA is often the tool of choice searched by many librarians and end-users for marine science literature. For this reason, this study answers the question, "Is ASFA sufficient as a sole source of marine information, or would the use of an additional commonly-available, inexpensive multidisciplinary database significantly improve the recall and/or currency of the results retrieved during a search session?"
The two multidisciplinary databases chosen for the study were *UnCover* and *Current Contents on Disk*. Selection was based on costs, coverage, and availability. Both are inexpensive when compared to similar databases, multidisciplinary in scope, and often readily-available in marine science libraries. In addition, they are well advertised in the science literature, prompting end-users to approach librarians with questions regarding their utility.

Each of these databases may be available in a variety of versions and distributed by various vendors. Table 1 provides the basic database statistics for the following versions selected for this study:

- **ASFA** - Cambridge Scientific Abstracts (Internet accessible)
- **UnCover** - Knight-Ridder (Internet accessible)
- **CCoD** - Institute for Scientific Information (3.5 diskettes)
  - Agriculture, Biology, and Environmental Science Version
  - Physical, Chemical, and Earth Sciences Version

<table>
<thead>
<tr>
<th></th>
<th>Annual Cost</th>
<th>Dates Cov'd</th>
<th>Total # of Records</th>
<th># of Serials Indexed</th>
<th>Update Freq.</th>
<th>Subjects</th>
</tr>
</thead>
<tbody>
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<td><strong>ASFA</strong></td>
<td>$4,029</td>
<td>1978 -</td>
<td>435,000</td>
<td>4,500</td>
<td>Monthly</td>
<td>Aquatic Sciences</td>
</tr>
<tr>
<td><strong>UnCover</strong></td>
<td>Free</td>
<td>1988 -</td>
<td>7 million</td>
<td>17,000</td>
<td>Daily</td>
<td>All Subjects</td>
</tr>
<tr>
<td><strong>CCoD</strong></td>
<td>$1,120</td>
<td>NA</td>
<td>NA</td>
<td>1,800</td>
<td>Weekly</td>
<td>Agriculture, Biological and Physical Sciences</td>
</tr>
</tbody>
</table>

Table 1. Database Vital Statistics (from promotional literature)

**METHODOLOGY**

Three descriptive criteria comprise the method used to examine the three databases: journal coverage, uniqueness, and currency.

*Journal Coverage* - Journal coverage measures the number of marine science journals indexed by each of the three databases. Journal coverage in this paper is one element of the seven-element database coverage evaluation methods enumerated by Markham (1991). In this method, databases are compared in relation to a known list of journal titles by simply asking, “Who indexes what?” As this is a simple title count, journal coverage does not take depth of indexing into account.

First, a sample of core marine science research journal titles was created. Using Barnett’s core list of marine science periodicals, the authors selected every fifth title listed alphabetically, creating a list of 73 titles or 20% of the core (Barnett 1986, 1995).
Second, each database journal source list was matched against the sample list. Searches in the source field (journal title field) were also conducted to ensure the source list accuracy.

Uniqueness - Uniqueness measures the citation overlap among the databases. With ASFA as the benchmark for citation coverage, this study identified the number of citations unique to UnCover when compared to ASFA and the number of citations unique to CCoD when compared to ASFA.

First, seven subject profiles were created. As with Stebelman’s (1994) study of UnCover and three other end-user databases, the authors’ selected subject profiles based on the media coverage of the topics as well as the authors’ common research experiences. In addition, efforts were made to include common natural language terms or taxonomic names to reduce possible synonyms. With this in mind, the following search profiles were created:

- Red and Tide*
- Oil and Spill*
- Sea and Level
- Coast* and Erosion*
- (Marsh and Grass*) or (Spartina and alterniflora)
- Pelican* or Pelecanus
- Redfish* or Sebastes

Second, title index searches were performed. To avoid inconsistencies inherent with subject or keyword field searching and bias attributable to variations in index sophistication, searching was limited to title fields (Tenopir 1982; Hightower & Schwartwalder 1991). Furthermore, as UnCover does not provide subject indexing, and keywords in titles indicate topical significance, title searching effectively leveled the playing field among databases.

Currency - Traditionally, currency measures the time lag between the publication and distribution of a document and the indexing of that document in a database. For this paper, the relative currency of each database is obtained via comparing UnCover and CCoD’s indexing currency to ASFA’s indexing currency.

First, 10 journals indexed in all three databases were identified. They are as follows:

- Aquaculture (Aqac)
- Aquatic Botany (AqBot)
- Bulletin of Marine Science (BoMS)
- Canadian Journal of Fisheries and Aquatic Science (CJF&AS)
- Environmental Biology of Fishes (EnBioFish)
- Estuarine, Coastal and Shelf Science (EsCoa&ShS)
- Fisheries (Fisheries)
- Journal of the Marine Biological Association (J MBA)
- Journal of Experimental Marine Biology and Ecology (JE xMarB&E)
- Marine Chemistry (MarChem)
Second, the most recent issue indexed by each of the databases for these journal titles was ascertained and the dates compared. With the searching constraints of Cambridge Scientific Abstracts' edition of ASFA, known-item searches (feature articles) were performed in lieu of contents searching as performed in the other two databases.

RESULTS AND DISCUSSION

Coverage - Figure 1 illustrates and compares the journal coverage results. Of the 73 randomly-selected core marine journals, ASFA contained citations from 66 (90%). UnCover, with the second highest number of inclusions, contained 54 (74%) of these journals, while CCoD included 38 (52%).

Certainly this section underscores the superiority of ASFA as a marine science database. With only journal coverage percentages of 74% and 52%, UnCover and CCoD do not index enough of the core marine science journals to supplant ASFA (90%). Accordingly, the use of either multidisciplinary database as a sole source of citations may lead to inadequate results; yet, the broad scope of either UnCover and CCoD allows searchers to obtain unique and topical citations not published in marine science journals or indexed in ASFA.

![Figure 1. Percentage of 73 randomly-selected core marine journals covered in database.](image)

Uniqueness - The results from the subject searches in each of the databases are shown in Table 2. Included are the number of citations retrieved via title field searches within each of the chosen databases using each of the seven subject search profiles.

Searches in ASFA retrieved a total 158 citations with the search term(s) in the title field, while UnCover and CCoD retrieved 193 and 99, respectively. Table 2 also displays the number of citations retrieved unique to each multidisciplinary database when compared to ASFA. Searches in UnCover led to a total of 107 citations that failed to appear in ASFA. Similarly, a total of 30 citations not available in ASFA were retrieved in CCoD. In addition, as a comparison tool and as a means to demonstrate ASFA's strength as an independent source of marine science information, the total number of citations retrieved without the limitation of a title field-only search for each of the seven subject searches is displayed in this table.
These results show that both UnCover and CCoD provided a significant number of unique references not appearing in ASFA. Using UnCover as a complement to ASFA increased overall recall by 68%; that is, the use of UnCover added a total of 107 new citations to the 158 retrieved in ASFA – a fairly notable number considering the topical significance of the articles (keywords are in the title). To a lesser extent, CCoD also increased recall by 19%.

There is little doubt that these findings reflect the interdisciplinary nature of UnCover and CCoD. This attribute allows searchers to obtain relevant literature published outside of the core marine science journals. For instance, journals such as Analytical Chemistry, Biochemical Systematics and Ecology, Canadian Biodiversity, Canadian Journal of Earth Science, Discover, Journal of Environmental Economics, Natural Resources and Environment, Public Works, Shore and Beach, Soil Technology, etc., though not covered in ASFA, contain articles on marine science topics. Thus, this interdisciplinary nature and increased recall provided by UnCover, and to a lesser extent by CCoD, proves to be quite complementary to ASFA’s journal coverage.

<table>
<thead>
<tr>
<th>Search Term</th>
<th>Red Tide</th>
<th>Oil Spill</th>
<th>Sea Level</th>
<th>Coastal Erosion</th>
<th>Marsh Grass</th>
<th>Pelican</th>
<th>Redfish</th>
<th>Totals</th>
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</thead>
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<tr>
<td>ASFA</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<td>58</td>
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<td>14</td>
<td>7</td>
<td>4</td>
<td>28</td>
<td>158</td>
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<tr>
<td>Total Hits</td>
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<td>124</td>
<td>103</td>
<td>157</td>
<td>43</td>
<td>14</td>
<td>64</td>
<td>591</td>
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<td>UnCover</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Title Field</td>
<td>34</td>
<td>74</td>
<td>26</td>
<td>20</td>
<td>7</td>
<td>12</td>
<td>20</td>
<td>193</td>
</tr>
<tr>
<td>Unique Hits</td>
<td>10</td>
<td>54</td>
<td>9</td>
<td>11</td>
<td>4</td>
<td>9</td>
<td>10</td>
<td>107</td>
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<tr>
<td>CCoD</td>
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<td>10</td>
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<td>4</td>
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<td>5</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td>30</td>
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</tbody>
</table>

Table 2. Number of citations retrieved for each of the seven search terms.

Currency - Table 3 contains the cover date of the most recent periodical issue indexed by each database. For the purpose of comparing the overall currency of ASFA, UnCover, and CCoD, the relative currency of each database is plotted in Figure 2. Please note that due to size limitations, the most current issue of the journal Environmental Biology of Fishes indexed by ASFA (March 1995) does not appear in this table.

On average and as expected, CCoD proved to be the most current of the three resources, indexing journals 4 issues ahead of ASFA. UnCover, a close second, indexed journals 3.4 issues ahead of ASFA. These results are clearly significant: If a search were performed in only ASFA, the most current citations would be unavailable, as would the past literature published in backlogged titles awaiting ASFA indexing. Taking into consideration the nature of scientific research and the necessity to have immediate information transfer, the addition of a search in UnCover and/or CCoD will help bridge the gaps created by ASFA’s currency time lag.
<table>
<thead>
<tr>
<th>Aquaculture</th>
<th>ASFA</th>
<th>UnCover</th>
<th>CCoD</th>
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<td>20-Aug-96</td>
<td>30-Jul-96</td>
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<td>Jun-96</td>
<td>Jun-96</td>
</tr>
<tr>
<td>Env. Biology of Fishes</td>
<td>Mar-96</td>
<td>Apr-96</td>
<td>Apr-96</td>
</tr>
<tr>
<td>Estuar. Coast. &amp; Shelf Sci.</td>
<td>Mar-95</td>
<td>Sep-96</td>
<td>Sep-96</td>
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<tr>
<td>Fisheries</td>
<td>Jun-96</td>
<td>Sep-96</td>
<td>Sep-96</td>
</tr>
<tr>
<td>JMA</td>
<td>Feb-96</td>
<td>Aug-96</td>
<td>Aug-96</td>
</tr>
<tr>
<td>Marine Chemistry</td>
<td>May-96</td>
<td>Dec-95</td>
<td>Aug-96</td>
</tr>
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</table>

Table 3. Cover date of the most recent issue indexed by each database (searches conducted 10/1/96).

Figure 2. Database currency comparison.
CONCLUSION

This study has compared three commercial databases using common database comparison methods (journal coverage, uniqueness, and currency). The overall objective of this study, however, was not to identify the best database for retrieving literature in the marine sciences; ASFA substantially outperforms the other databases in marine science content. Instead, the purpose was to elucidate the benefit of understanding the strengths and weaknesses of the various databases available in the field and the potential rewards of searching complementary databases to best fit the search profile without paying for an exhaustive array of databases. Such was the case in this study, for the reward of adding the results of an UnCover or CCoD search to an ASFA search included improvements in recall and currency.

Additionally, as these are three end-user databases distributed over three different media, heightened user-education and service promotion are required to get searchers to look beyond the single subject-specific database. Hopping from one database interface to another can make searching additional databases an unattractive option, regardless of improved citation recall or currency. To overcome this barrier, reorganizing electronic services to take advantage of the World Wide Web and Z39.50 server/gateway distribution of databases could solve many of the problems associated with user education and service promotion. If a searcher could use ASFA, UnCover, CCoD and other databases seamlessly and simultaneously, the searcher wouldn’t wonder if he or she were searching the most current or most complete bibliographic resource. As all three database vendors are developing Z39.50 server versions of these resources, interface integration of these three databases will be available in 1997.

REFERENCES


