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NAVAL OCEAN RESEARCH AND DEVELOPMENT ACTIVITY NSTL S--ETC F/G 8/10
OCEANOGRAPHIC MANAGEMENT AND INFORMATION SYSTEM (OMIS): THE NAV--ETC(U)
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NORDA-TN-67

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LEVEL II

NORDA Technical Note 67

Oceanographic Management and Information System (OMIS): The Navy Oceanographic Program, Database.

10 S. Wasowski

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B.S.

AD A091186

Environmental Requirements and Program Analysis Group,

14 NORDA-TN-67

11 Sep 1980

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Naval Ocean Research and Development Activity

NSTL Station, Mississippi 39529

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ABSTRACT

The Navy's Oceanographic Program (NOP) contains many diverse projects in a wide variety of scientific and technological disciplines. The NOP database is a collection of information pertaining to the current projects of the Navy's oceanographic community, the objective of the database is to provide an information tool to management. Data elements include project title, performing organization and principal investigator, sponsor, program element funding, and a classification of the project's purpose using a closed vocabulary keyword system.

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INTRODUCTION

The Navy's Oceanographic Program contains many diverse projects in a wide variety of scientific and technological disciplines. The task of overseeing such a program effectively is challenging. To make this task more manageable, the Oceanographer of the Navy established the requirement for an Oceanographic Management Information System (OMIS). This system is to be comprised of several subsets, one of which, the Navy Oceanographic Program Database, is the subject of this paper.

The purpose of this report is to make the existence of this database known to scientists and management of NORDA. This is the first step in evaluating the in-house utility and effectiveness of this capability.

NAVY OCEANOGRAPHIC PROGRAM: OVERVIEW

The Navy Oceanographic Program (NOP) Database is a collection of information pertaining to the current projects of the Navy's Oceanographic community. The objective of the Database is to provide an information tool to management which can be used to examine the Program for response to requirements, redundancies, cost effectiveness and a variety of other management questions.

Data elements include project title, performing organization and principal investigator, sponsor, program element funding and a classification of the project's purpose using a closed vocabulary keyword system (see Appendix 1). This feature is particularly useful since the same closed vocabulary keyword system is employed in the Navy Oceanographic Requirements (NOR) Database. The commonality of the keyword vocabulary in both systems provides the desired link between programs and requirements.

The initial information set, excluding the keywords, is obtained from the Defense Technical Information Center (DTIC) via the Work Unit Assignment Summary (DD Form 1498). This dataset is checked for completeness by totaling the funding from individual work units and comparing them to totals from higher level summaries, e.g., program element totals. Any deficiencies are noted and corrections are made at this time. The keyword information is supplied by an analyst with experience in the subject matter of the work unit. The entire information set is then input into a general purpose computerized database management system for storage and retrieval.

NOP DETAILED VIEW

The Software

The NOP Database is operated under the "CREATABASE" software system which is proprietary to the Daniel Analytical Services Corporation. CREATABASE is part of an extensive information management and analysis system and represents the data storage and retrieval capabilities of the system. The organization of the data files is essentially relational, which means that any data element of a record may be searched, rather than just "keyed" elements. In addition, the system is extremely flexible, in that data elements may be changed or new data elements defined for the database without necessitating a major reprogramming effort. These characteristics were deemed essential for keeping track of a dynamic entity, such as the Navy's Oceanographic Program, without devoting an inordinate amount of resource to reprogramming or "freezing" the system at a particular state and forcing all subsequent information to conform to that system.

CREATABASE allows three types of data elements, a NAME type data element for alphanumeric or text information, a FROM-TO type data element for numeric information and a CODE type data element for data which exist only in specific states (for example, classified or unclassified).

A record consists of a set of data elements. Any record or set of records may be isolated from the database if the information in that record matches the logical constraints of a user-defined query. A query specifies a data element or collection of data elements and the value, set of values, or range of values which the data element must have in order to be selected. Some examples of queries and system responses are given in the section on Data Elements. The logic of the selection criteria in the query as well as the length of the query are not constrained by the system. This gives the user a tremendous amount of flexibility in designing a query.

The basic display of CREATABASE is just a listing of selected data elements from records isolated by a query. This may be a limitation initially; however, the capability exists for passing the selected information to external routines for additional processing. Thus, the requirement, for example, for a regular report formatted with column headings and including subtotals and totals could be readily accommodated. In addition a graphics package is associated with the overall system, which also enhances the output capabilities. Thus, the apparent limitation in the display capability of CREATABASE itself is not considered a serious shortcoming.

CREATABASE allows for the timely initiation of a reasonably sophisticated information system, and also allows that system to grow and develop as the requirements on that information system change.

The Data Elements

As outlined in the overview, the data elements for the NOP cover items that describe the projects, their resource utilization, sponsoring and performing organizations, and a classification of the project. These areas are covered in forty-eight data elements described in Table 1.

Any of these data elements can be searched. In addition, any combination of data elements with their associated qualifications or restrictions may be searched and, in turn, any of the data elements can be displayed. Since the information in the DATABASE is continually being updated, any examples listed here may no longer reflect accurately the present program. However, for the purpose of illustration several sample queries are included here which reflect the state of the database on 14 November 1979. These queries are given to show some of the system's capabilities for producing answers to real questions.

Example 1: Produce a listing of principal investigator and performing organization for ongoing projects at the Naval Postgraduate School.

SORT AND PRINT (PRINCIPAL INVESTIGATOR, PERFORMING ORGANIZATION) FOR PROJECTS WITH PERFORMING ORGANIZATION, NAVAL POSTGRADUATE SCHOOL*

ISOLATIONS	TOTAL	PERCENTAGE
5	475	1.05
HADERLIE E. C.		NAVAL POSTGRADUATE SCHOOL
MEDWIN H.		NAVAL POSTGRADUATE SCHOOL
RENARD R. J.		NAVAL POSTGRADUATE SCHOOL
WILLIAMS R. T.		NAVAL POSTGRADUATE SCHOOL

Table 1. Data Elements for NOP DATABASE

<u>Data Element Sequence Number</u>	<u>Data Element</u>	<u>Type</u>	<u>Format</u>	<u>Description</u>
1	SUMMARY SECURITY	CODE	A1	U, C, S or T referring to classification level of source material
2	WORK SECURITY	CODE	A1	U, C, S or T referring to classification level of the work being performed
3	ID NUMBER	NUMERIC	I6	The numeric part of the DTIC accession number, or other numeric identifier
4	PROJECT TITLE	TEXT	A72	Title given to project (1st 72 characters if title is longer than that)
5	PERFORMING ORGANIZATION	TEXT	A72	Name of organization where work is being done
6	PRINCIPAL INVESTIGATOR	TEXT	A72	Name of principal investigator
7	PI AREA CODE	NUMERIC	I3	Area code of principal investigator's phone number
8	PI PHONE	NUMERIC	I7	Principal investigator's phone number
9	SPONSOR	TEXT	A72	Organization providing funds to support work
10	CONTACT PT-SPONSOR	TEXT	A72	Person at above organization who is responsible for funding
11	CP AREA CODE	NUMERIC	I3	Area code of sponsor's phone number
12	CP PHONE	NUMERIC	I7	Sponsor's phone number
13	PROGRAM ELEMENT	NUMERIC	I5	Five numeric digits of the program element providing funding for the work
14	PROJECT	ALPHANUMERIC	A72	Project designator within the program element
15	TASK AREA	ALPHANUMERIC	A72	Task area designator within the project
16	FISCAL YEAR	NUMERIC	I2	Fiscal year of the funding

Table 1 (con't)

<u>Data Element Sequence Number</u>	<u>Data Element</u>	<u>Type</u>	<u>Format</u>	<u>Description</u>
17	\$ LAST FY	NUMERIC	F6.1	Funding in thousands of dollars
18	\$ THIS FY	NUMERIC	F6.1	for Fiscal Year listed in item 16 and the
19	\$ NEXT FY	NUMERIC	F6.1	prior and following years
20	WORK YEARS FY-1	NUMERIC	F5.1	Number of professional manyears allocated
21	WORK YEARS FY	NUMERIC	F5.1	to the project for the fiscal year listed in
22	WORK YEARS FY+1	NUMERIC	F5.1	item 16 and the fiscal year before and after it
23	REVIEWER	TEXT	A72	Name of person who collected and evaluated the information
24	PROJECT THRUST	TEXT	A72	Up to three selections from the "PROJECT"
25	THRUST 2	TEXT	A72	THRUST" category of the oceanographic
26	THRUST 3	TEXT	A72	MIS DATA SHEET*
27	MODIFIER	TEXT	A72	Up to three selections from the "LOCATION"
28	MOD 2	TEXT	A72	category
29	MOD 3	TEXT	A72	
30	MAJOR AREA	TEXT	A72	Up to three selections from the "MAJOR AREA"
31	MAREA 2	TEXT	A72	category
32	MAREA 3	TEXT	A72	
33	SUB-AREA	TEXT	A72	Up to four selections from the "FIRST LEVEL
34	1 SUB 2	TEXT	A72	SUB AREA" category
35	1 SUB 3	TEXT	A72	
36	1 SUB 4	TEXT	A72	
37	SUB-SUB-AREA	TEXT	A72	Up to four selections from the "SECOND LEVEL
38	2 SUB 2	TEXT	A72	SUB AREA" category
39	2 SUB 3	TEXT	A72	
40	2 SUB 4	TEXT	A72	

*The Oceanographic MIS Data Sheet is included as Appendix 1.

Table 1 (con't)

<u>Data Element Sequence Number</u>	<u>Data Element</u>	<u>Type</u>	<u>Format</u>	<u>Description</u>
41	1498 COMMENTS	TEXT	A72	Comments referring to accuracy/completeness of source
42	DATE REVIEWED	NUMERIC	I6	Year, month and date when the information was entered into the DATABASE (YYMMDD format)
43	THRUST	LINK	A72	Allows for simultaneous searching or listing of items 24, 25 and 26
44	MOD	LINK	A72	Allows for simultaneous searching or listing of items 27, 28 and 29
45	AREA	LINK	A72	Allows for simultaneous searching or listing of items 30, 31 and 32
46	SUB	LINK	A72	Allows for simultaneous searching or listing of items 33, 34, 35 and 36
47	2 SUB	LINK	A72	Allows for simultaneous searching or listing of items 37, 38, 39 and 40
48	PERFORMING STATE	TEXT	A72	State (or country) in which work is being performed

Example 2: This example illustrates the use of descriptor numbers instead of descriptor names in the query.

SAP (6, 5) FOR WITH 5, NAVAL POSTGRADUATE SCHOOL*

ISOLATIONS	TOTAL	PERCENTAGE
5	475	1.05
HADERLIE E. C.		NAVAL POSTGRADUATE SCHOOL
MEDWIN H.		NAVAL POSTGRADUATE SCHOOL
RENARD R. J.		NAVAL POSTGRADUATE SCHOOL
WILLIAMS R. T.		NAVAL POSTGRADUATE SCHOOL

NOTE: When the output is sorted, duplicates are suppressed so R.J. Renard only appears once, even though there are two projects associated with him.

Example 3: This example illustrates the use of HOLD to indicate the same records selected in the previous query.

PRINT (PROJECT TITLE, PRINCIPAL INVESTIGATOR) FOR WITH HOLD*

U OCEAN PARAMETERS AFFECTING SOUND PROPAGATION	MEDWIN H.
U BIOLOGY OF WOOD & STONE BORERS IN DEEPER WATER OF MONTEREY BAY	HADERLIE E.C.
MARINE FOG FORECASTING	RENARD R.J.
NUMERICAL MODELING OF UNIQUE ATMOSPHERIC PHENOMENA	WILLIAMS R.T.
APPLICATION OF MODEL OUTPUT STATISTICS	RENARD R.J.

ISOLATIONS	TOTAL	PERCENTAGE
5	475	1.06

Example 4: This example illustrates the use of SAME to produce the same format print output as the previous query.

PRINT SAME FOR WITH PERFORMING ORGANIZATION, NRL*

EFFECTS OF BASALT BOUNDARY ON LOW FREQUENCY REFLECTIVITY
 SOUND SOURCE FOR 1 TO 10 HZ RANGE
 STRATOSPHERIC GLOBAL PREDICTION MODEL
 TROPICAL CYCLONE DYNAMICS PREDICTION MODEL
 ROUGH START DATA REVIEW

ISOLATIONS	TOTAL	PERCENTAGE
5	475	1.05

Example 5: This example illustrates the use of the STATISTICS command to provide information on numeric descriptors.

STATISTICS \$ LAST FY, \$ THIS FY FOR THOSE ENTRIES IN CALIFORNIA --
 WITH PERFORMING STATE, CA*

ISOLATIONS	TOTAL	PERCENTAGE
130	475	27.37

ESN	MINIMUM	MAXIMUM	FREQ	SUM	MEAN	STD DEV
17	.0	3721.0	114	17955.6	157.51	446.19
18	.0	3402.0	124	20514.8	165.44	419.29

Example 6: This example illustrates the use of multi-element Boolean expression in the selection criteria.

SORT AND PRINT PERFORMING ORGANIZATION, (PRINCIPAL INVESTIGATOR, \$ THIS FY)
(PROJECT TITLE) (SPONSOR, PROGRAM ELEMENT) FOR PROJECTS WITH THRUST, MEASUREMENTS AND
SUB, BIOLOGICAL AND \$ THIS FY, FROM 20.0 TO 40.0*

ISOLATIONS	TOTAL	PERCENTAGE	
11	475	2.32	
COLUMBIA UNIVERSITY			
	BROECKER W.S.	40.0 K\$	
	BENTHIC BIOTURBATION IN DEEP OCEAN SEDIMENTS		
	ONR		61153
FLORIDA STATE UNIVERSITY			
	THISTLE D.	22.0 K\$	
	ELEMENTS OF BIOTURBATION		
	ONR		61153
NAVAL POSTGRADUATE SCHOOL			
	HADERLIE E.C.	22.6 K\$	
	U. BIOLOGY OF WOOD & STONE BORERS IN DEEPER WATER OF MONTEREY BAY		
	ONR		61153
SCRIPPS INSTITUTE OF OCEANOGRAPHY			
	MULLIN M.M.	23.0 K\$	
	PLANKTON PATCHINESS RELATIVE TO HYDROGRAPHY & BIOLOGY		
	ONR		61153
	PINKEL ROBERT	25.0 K\$	
	MID SCALE ZOOPLANKTON PATCHINESS		
	ONR		61153
TEXAS A&M RESEARCH FOUNDATION			
	SCHWARTZ J.R.	34.0 K\$	
	U NAVY ENVIRONMENT MICROBIAL PRODUCTION OF NONCONSERVATIVE GASSES		
	ONR		61153
T.C.U.			
	BRITTON J.C.	38.0 K\$	
	U NAVY ENVIRONMENT CRITICAL LIFE CYCLE STAGES OF THE FOULING CLAM CORBICULA		
	ONR		61153
UNIVERSITY OF MIAMI			
	GERCHAKOV S.M.	32.0 K\$	
	U NAVY ENVIRONMENT RES. ON EFFECTS OF METABOLIC PRODUCTS OF BACTERIA ON METAL		
	ONR		61153
UNIVERSITY OF WASHINGTON			
	SCHOENER AMY	22.3 K\$	
	ASPECTS OF TEMPORAL & SPATIAL VARIABILITY OF SUCCESSION		
	ONR		
WOODS HOLE OCEANOGRAPHIC INSTITUTE			
	MANN R.	27.0 K\$	
	U NAVY ENVIRONMENT WOOD PROTECTION SHIPWORM ENERGY BUDGETS		
	ONR		
	SHELTEMA R.S.	40.0 K\$	
	U PELAGIC DEVELOPMENT & SETTLEMENT BY LARVAE OR MARINE FOULING ORGANISMS		
	ONR		

As can be seen from the examples, the print output can be quite extensive or very brief, as required. Also the Boolean Expression used as the selector criteria can be very complex.

Data Sources

The first line source for information relating to the Navy's Oceanographic Program is the Defense Technical Information Center (DTIC). The Research and Development Activities in the Navy regularly report their work to DTIC in their Work Unit Assignment Summaries (DD Form 1498). DTIC can furnish information on all work which has been reported to it and included in the computerized on-line system. A major limitation of the DTIC system is that since it is responsible for maintaining information for all Department of Defense sponsored activities, it must rely on the input from those activities. In addition, since the volume of information is so great, very little front end editing or quality control can be done on the input data without causing a tremendous backlog on data entry. The major advantage of the system described here is that it is concerned with the Oceanographic Program of the Navy. Analysts who review the inputs for accuracy and completeness are familiar with various aspects of the Navy's program from years of involvement. They can bring this expertise to the analysis and interpretation phase and can also use more direct sources of information to assess whether the work reported by DTIC represents a complete information set. Pursuing the information along these various avenues, the analysts can fill in the gaps in the reported information and significantly enhance the completeness of the database.

Retrieval and Access Methods

Some specifics of the retrieval process were illustrated in the examples given in the section on data elements. The underlying software system, in order to keep computer overhead to a minimum, does not perform an elaborate set of checks on the user to ascertain whether the operations he is attempting are the ones which are actually intended. In other words, the software system assumes a friendly user who is familiar with the system's operation. Because of this lack of systems checks, an unfamiliar user could easily wipe out an entire dataset by executing the wrong command. To avoid this, and to allow access to the information to outside users without first having to learn the system, access to the system's information is through a human interface. A prospective user of the information would call up NORDA Code 115 and describe the information desired. The query would then be processed and the reply furnished by a return phone call or other means if the information was such that the telephone was inappropriate (e.g., for security reasons). Thus, the user need only know what information he requires in order to exercise the system.

When system usage becomes heavy enough to warrant the development of a direct user access capability, the present access system will be re-evaluated. The major objective of this system is to make programmatic information available to management level personnel in a manner timely enough to be of significant use in their decision-making process.

To request more information about the system, or to query the database, correspondence should be directed to:

Commanding Officer
Naval Ocean Research and Development Activity
Attn: Code 115 NOP DATABASE
NSTL Station, MS 39529

or telephoned:

A/V 485-4887
FTS 494-4887
Commercial 601-688-4887

Appendix 1

Oceanographic Management Information

System Data Sheet

and

Research and Technology Work Sheet Summary
(DD Form 1498)

OCEANOGRAPHIC MANAGEMENT INFORMATION SYSTEM DATA SHEET

ACCESSION NUMBER

NIS I.I. NUMBER

KEYWORD LIST---circle those which apply

- A. PROJECT THRUST
 Measurements
 Survey
 Theory
- Models
 Analysis
 Hardware
 Prediction
- Software
 Fleet Exercise Support
 N/A
- B. WARFARE AREA SUPPORTED
 (AS) Anti-submarine Warfare
 (CS) Surveillance
 (MW) Mine Warfare
 (AW) Amphibious
- (AA) Anti-air
 (SH) Anti-surface Ship
 Strike
 (SW) Special (Inshore, Riverine,
 Beach Recco, e.g.)
- (CC) C3
 EW
 (SL) Logistics
 Intelligence
 (SB) Seabased Strategic
 (PN) Personnel-medical
- C. MAJOR AREA
 Administration
 Operations
 Meteorology
 Remote Sensing
- Oceanography
 Acoustics
 Geology/Geophysics
 Documentation/Planning
- Cartography
 Special Programs _____
 Special Areas _____
 Hydrography

1. FIRST LEVEL SUB AREA

- | | | | |
|--|--|--|---|
| OCEANOGRAPHY/METEOROLOGY
Biological
Chemical
Physical
Dynamic/Synoptic
Engineering-construction
Living-medical
Other Oceanographic
Other Meteorologic
Climatology | ACOUSTICS
Transmission
Reverberation
Ambient Noise
Bottom Interaction
Measurement Systems
Low Frequency
Mid Frequency
High Frequency
Other Acoustic | GEOLOGY/GEOPHYSICS/CARTOGRAPHY
Sea Floor Structure
Sediment Dynamics
Sea Floor Acoustics
Gravity
Magnetics
Bathymetry
Seismic Profiling
Navigation
Other Geologic | OTHER
Indian Ocean
Southern
Hemisphere
Arctic-Antarctic
Coastal -Shallow
Straits
Other Special Area
Satellite
Communications
Instrumentation
Other Remote Sens.
Display |
|--|--|--|---|

2. SECOND LEVEL SUB AREA
 air-sea interaction
 Surface Waves/seastate
 Current Velocity
 Salinity/Conductivity
 Temperature
 Currents
 Internal Waves
 Vertical Shear

- Horizontal Noise
 Vertical Noise
 Depth Dependence
 Noise Fluctuations
 Noise Coherence
 Man-Made Noise
 Natural Noise
 Other Noise
- Direct Transmission
 Duct Transmission
 Half Channel Trans.
 RAP Mode Trans.
 Convergence Zone
 Bottom Transmission
 Signal Fluctuations
 Signal Coherence
 Signal Characteristics
 Other Transmission

- Cloud Cover
 Fog
 Atmos. Ducting
 E.M.I.
 Wind
 Storms

3. LOCATION

- WATER DEPTH
 Surface
 Near Surface
 Intermediate
 Deep

- PLACE IN WATER COLUMN
 Near Surface
 Intermediate
 Near Bottom
- ATMOSPHERIC REGIME
 Troposphere
 Stratosphere
 Ionosphere

- PLACE IN SPHERE
 Lower
 Middle
 Upper

UNCLASSIFIED

NOT AVAILABLE

OTHER

Security Classification and Downgrading				NAVAL OCEAN RESEARCH AND DEVELOPMENT ACTIVITY NSTL STATION, MISSISSIPPI 39529			
RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION*	2. DATE OF SUMMARY*	REPORT CONTROL SYMBOL	
				3			
3. DATE PREV. SUMM'RY	4. KIND OF SUMMARY	5. SUMMARY SCTY*	6. WORK SECURITY*	7. REGRADING*	8a. DISB'N INSTR'N	8b. SPECIFIC DATA CONTRACTOR ACCESS <input type="checkbox"/> YES <input type="checkbox"/> NO	8. LEVEL OF SUM A. WORK UNIT
		1	2				
10. NO./CODES*	PROGRAM ELEMENT	PROJECT NUMBER		TASK AREA NUMBER	WORK UNIT NUMBER		
A. PRIMARY	13	14		15			
B. CONTRIBUTING							
C. CONTRIBUTING							
11. TITLE (Precede with Security Classification Code)*							
4							
12. SCIENTIFIC AND TECHNOLOGICAL AREAS*							
13. START DATE		14. ESTIMATED COMPLETION DATE		15. FUNDING AGENCY		16. PERFORMANCE METHOD	
17. CONTRACT/GRANT				18. RESOURCES ESTIMATE		a. PROFESSIONAL MAN YEARS	b. FUNDS (in thousands)
A. DATES EFFECTIVE		EXPIRATION:		PRECEDING			
B. NUMBER*				FISCAL YEAR		17	20
C. TYPE		G. AMOUNT:		CURRENT		16	21
D. KIND OF AWARD						18	21
19. RESPONSIBLE DOD ORGANIZATION				20. PERFORMING ORGANIZATION			
NAME* 9 NAVAL OCEAN RESEARCH AND DEVELOPMENT ACTIVITY				NAME* 5			
ADDRESS* NSTL STATION, MS 39529				ADDRESS*			
RESPONSIBLE INDIVIDUAL				PRINCIPAL INVESTIGATOR (Furnish SSAN if U.S. Academic Institution)			
NAME 10				NAME* 6			
TELEPHONE 11 12				TELEPHONE 7 8			
GENERAL USE				SOCIAL SECURITY ACCOUNT NUMBER			
				ASSOCIATE INVESTIGATORS			
				NAME			
				NAME			

21. KEYWORDS (Precede EACH with Security Classification Code)

22. TECHNICAL OBJECTIVE* 24. APPROACH, 25. PROGRESS (Furnish individual paragraphs identified by number. Precede text of each with Security Classification Code)

The bold numbers which appear in the boxes above represent the data element numbers of the MIS (Table 1).

Security Classification and Downgrading

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REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
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		6. PERFORMING ORG. REPORT NUMBER
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9. PERFORMING ORGANIZATION NAME AND ADDRESS Naval Ocean Research & Development Activity NSTL Station, MS 39529		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
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19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Computers Data Management Information Systems Oceanography		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) The Navy's Oceanographic Program (NOP) contains many diverse projects in a wide variety of scientific and technological disciplines. The NOP database is a collection of information pertaining to the current projects of the Navy's oceanographic community, the objective of the database is to provide an information tool to management. Data elements include project title, performing organization and principal investigator, sponsor, program element funding, and a classification of the project's purpose using a closed vocabulary keyword system.		

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