

WORLD OCEAN DATABASE

Peter Ondrejka

Stručná história

- Projekt pod záštitou NOAA, konkrétne National Oceanographic Data Center (NODC) Ocean Climate Laboratory (OCL)



NOAA

NATIONAL OCEANIC AND
ATMOSPHERIC ADMINISTRATION
UNITED STATES DEPARTMENT OF COMMERCE

- World Ocean Atlas – 1994
- World Ocean Database – 1998, 2001, 2005, **2009**
- Najnovšie dáta 2010

Ciele projektu

- Sprístupniť čo najkompletnejší súbor historických dát o oceáne a planktóne v elektronickej forme, spoločne s metadátami a kontrolou kvality
- Tieto dáta majú pochádzať od individuálnych vedcov ako aj od tímov a inštitúcií na národnej a regionálnej úrovni
- Výstupy z oceánografických meraní

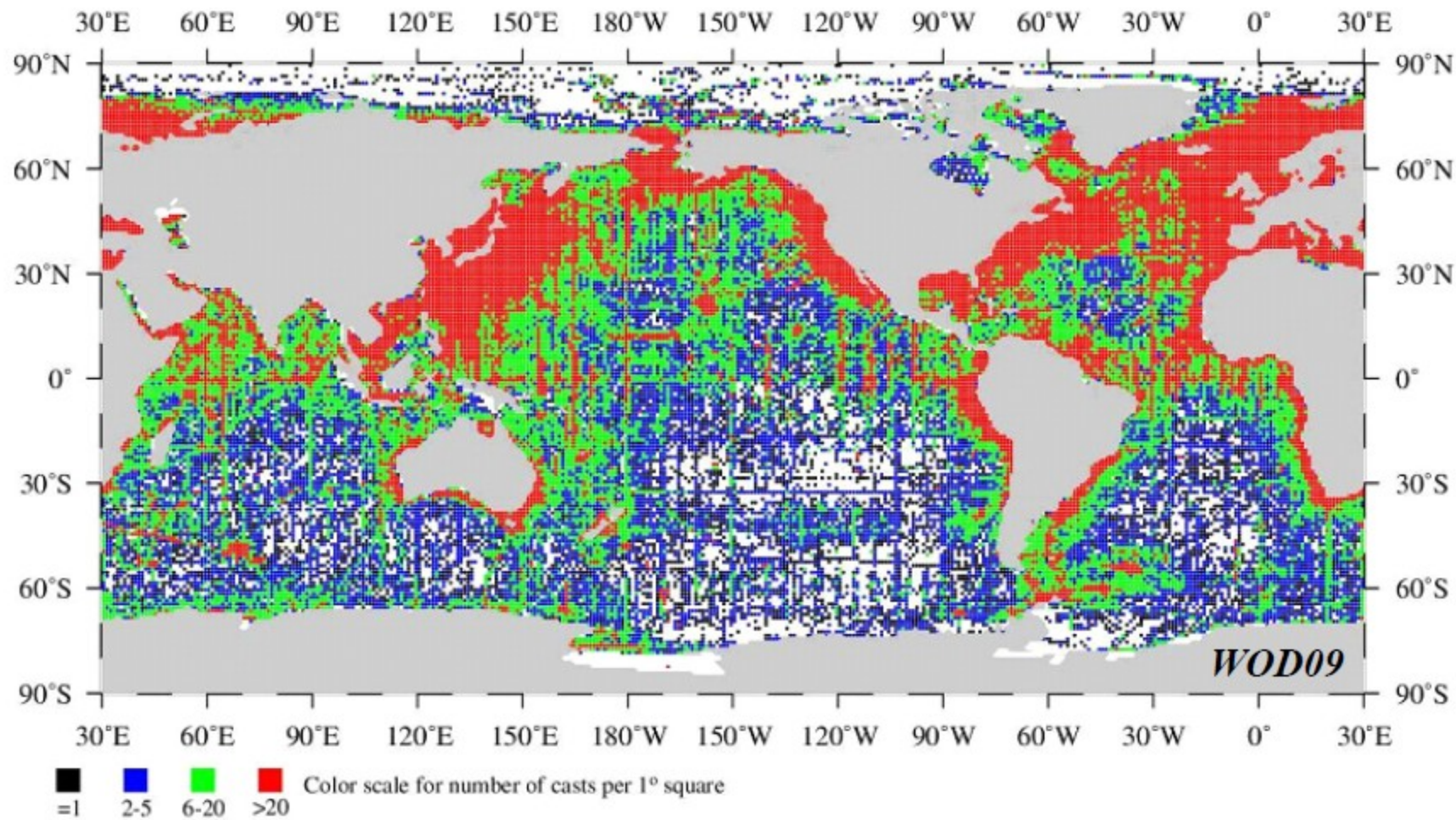
Organizácia dát

- **Profile** – súbor vertikálnych meraní jednej premennej
- **Cast** – viacero súčasne zistených profilov
- **Station** - dáta z viacerých castov v jednej lokalite
- **Cruise** - skupina stations
- **Accession Number**
- **Dataset** - všetky casty z podobných prístrojov s podobným rozlíšením

DATASET	SOURCE
OSD	Bottle, low-resolution Conductivity-Temperature-Depth (CTD), low-resolution XCTD data, and plankton data
CTD	High-resolution Conductivity-Temperature-Depth (CTD) data and high-resolution XCTD data
MBT	Mechanical Bathythermograph (MBT) data, DBT, micro-BT
XBT	Expendable (XBT) data
SUR	Surface only data (bucket, thermosalinograph)
APB	Autonomous Pinniped Bathythermograph - Time-Temperature-Depth recorders attached to elephant seals
MRB	Moored buoy data from TAO (Tropical Atmosphere-Ocean), PIRATA (moored array in the tropical Atlantic), MARNET, and TRITON (Japan-JAMSTEC)
PFL	Profiling float data
DRB	Drifting buoy data from surface drifting buoys with thermistor chains
UOR	Undulating Oceanographic Recorder data from a Conductivity/Temperature/Depth probe mounted on a towed undulating vehicle
GLD	Glider data

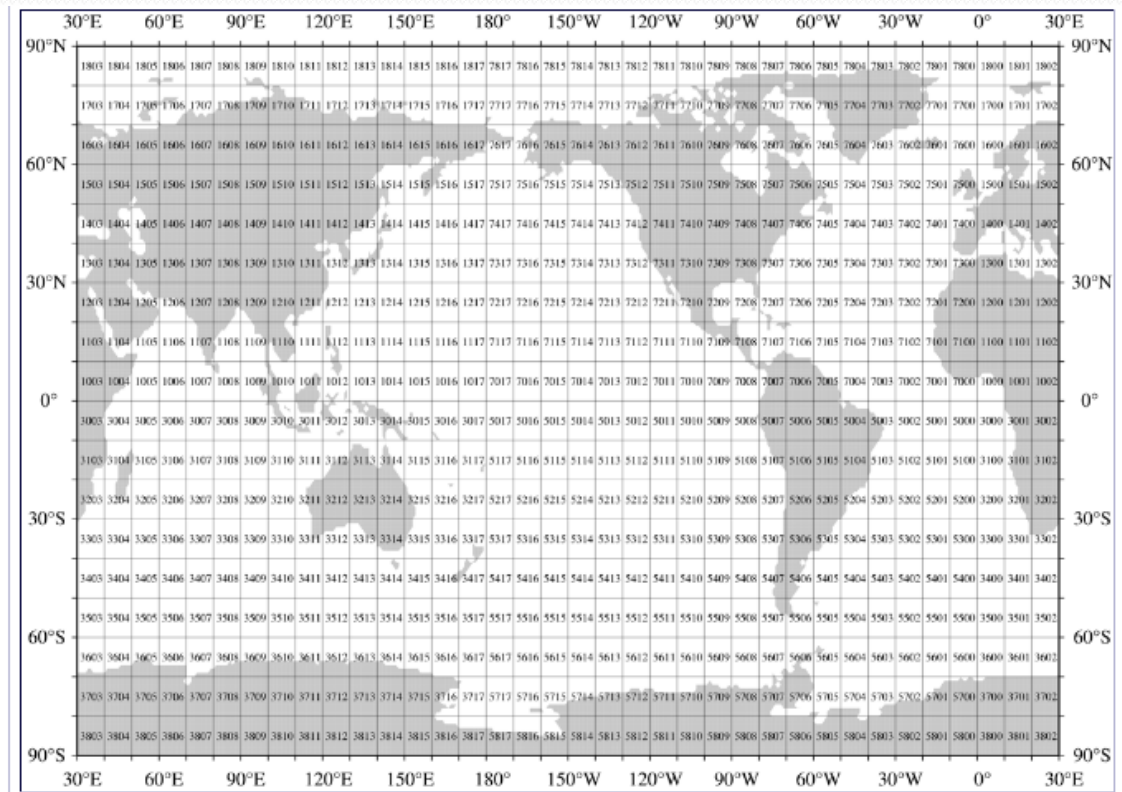
Variables	DATASETS					
	OSD	MBT	XBT	CTD	MRB	Total
Bottom depth (m)	1,451,069	617,108	444,565	352,007		2,864,749
Water color (Forel-Ule color scale)	231,968	12,411	429	1,087		245,895
Secchi disk visibility depth (m)	372,236	12,146	447	1,952		386,781
Wave direction (WMO 0877)	302,044	29,843	30,529	3,853		366,269
Wave height (WMO 1555)	164,546	114,145	47,257	9,768		335,716
Sea state (WMO 3700)	511,282	478,000	53,963	27,368		1,070,613
Wind force (Beaufort Scale)	420,311	14,444	2,199	3,948		440,902
Wave period (WMO 3155 or NODC 0378)	104,604	34,385	37,765	9,439		186,193
Wind direction (WMO 0877)	954,473	653,395	151,590	51,571	348,776	2,159,805
Wind speed (in knots)	531,432	673,101	153,368	46,986	351,301	1,756,188
Barometric pressure (millibar)	658,706	337,933	26,181	46,764	2,546	1,072,130
Dry bulb temperature (°C)	891,584	622,633	135,336	50,644	375,780	2,075,977
Wet bulb temperature (°C)	230,377	495,859	49,841	35,062		811,139
Weather condition (WMO 4501 and WMO 4677)	628,704	514,729	41,754	35,194		1,220,381
Cloud type (WMO 0500)	322,837	25,453	14,321	20,197		382,808
Cloud cover (WMO 2700)	604,530	523,929	25,751	29,515		1,183,725
Horizontal visibility (WMO 4300)	50,952	185,428	857	22,666		259,903
Reference/Sea surface temperature (°C)	24,876	1,172,477	115,942	391	1,421	1,315,107
Absolute air humidity (g m ⁻³)	56,451	1,565		82		58,098
Sea surface salinity		2,556	11,652			14,208

<input type="checkbox"/>	<input type="checkbox"/>	Temperature	°C	OSD, CTD, MBT, XBT, SUR, APB, MRB, PFL, UOR, DRB, GLD
<input type="checkbox"/>	<input type="checkbox"/>	Salinity	unitless	OSD, CTD, SUR, MRB, PFL, UOR, DRB, GLD
<input type="checkbox"/>	<input type="checkbox"/>	Oxygen	ml l ⁻¹	OSD, CTD, PFL, UOR
<input type="checkbox"/>	<input type="checkbox"/>	Phosphate	µM	OSD
<input type="checkbox"/>	<input type="checkbox"/>	Silicate	µM	OSD
<input type="checkbox"/>	<input type="checkbox"/>	Nitrate and Nitrate+Nitrite	µM	OSD
<input type="checkbox"/>	<input type="checkbox"/>	pH	unitless	OSD, SUR
<input type="checkbox"/>	<input type="checkbox"/>	Chlorophyll	µg l ⁻¹	OSD, CTD, SUR, UOR
<input type="checkbox"/>	<input type="checkbox"/>	Plankton	multiple	OSD
<input type="checkbox"/>	<input type="checkbox"/>	Alkalinity	meq l ⁻¹	OSD, SUR
<input type="checkbox"/>	<input type="checkbox"/>	Partial Pressure of Carbon Dioxide	µatm	OSD, SUR
<input type="checkbox"/>	<input type="checkbox"/>	Dissolved Inorganic Carbon	mM	OSD
<input type="checkbox"/>	<input type="checkbox"/>	Transmissivity	m ⁻¹	CTD
<input type="checkbox"/>	<input type="checkbox"/>	Pressure	dbar	OSD, CTD, UOR, GLD, PFL
<input type="checkbox"/>	<input type="checkbox"/>	Air temperature	°C	SUR
<input type="checkbox"/>	<input type="checkbox"/>	CO ₂ warming	°C	SUR
<input type="checkbox"/>	<input type="checkbox"/>	CO ₂ atmosphere	ppm	SUR
<input type="checkbox"/>	<input type="checkbox"/>	Air pressure	mbar	SUR
<input type="checkbox"/>	<input type="checkbox"/>	Tritium	TU	OSD
<input type="checkbox"/>	<input type="checkbox"/>	Helium	nM	OSD
<input type="checkbox"/>	<input type="checkbox"/>	Delta Helium-3	%	OSD
<input type="checkbox"/>	<input type="checkbox"/>	Delta Carbon-14	‰	OSD
<input type="checkbox"/>	<input type="checkbox"/>	Delta Carbon-13	‰	OSD
<input type="checkbox"/>	<input type="checkbox"/>	Argon	nM	OSD
<input type="checkbox"/>	<input type="checkbox"/>	Neon	nM	OSD
<input type="checkbox"/>	<input type="checkbox"/>	Chlorofluorocarbon 11 (CFC 11)	pM	OSD
<input type="checkbox"/>	<input type="checkbox"/>	Chlorofluorocarbon 12 (CFC 12)	pM	OSD
<input type="checkbox"/>	<input type="checkbox"/>	Chlorofluorocarbon 113 (CFC 113)	pM	OSD
<input type="checkbox"/>	<input type="checkbox"/>	Delta Oxygen-18	‰	OSD



Spôsoby vyhľadávania dát

- Rozdelené geograficky
- Podľa dátumu



WODselect



WORLD OCEAN DATABASE SELECT AND SEARCH

Note: new data added after the release of the WOD09 have not gone through the full set of quality control procedures and should be considered preliminary. The set of all casts that fall into this category are also available on the [WOD updates](#) page.

The WODselect retrieval system allows a user to search *World Ocean Database 2009* and new data added since its release using a user-specified search criteria. A distribution map and cast count of these search criteria will give the user the option to have the data extracted and placed on the NODC FTP site in the WOD09 native and ".csv" data format (more information about [downloading and reading the data files](#)). [*Important note about BT bias corrections in WOD09](#)

Build a Data Retrieval Request Based on Your Choice of Criteria:

To build a user defined search query:

1. Place check mark in front of any number of criteria.
2. Press the "Build a query" button.

(If any criteria below are not checked, the default will apply).

SEARCH CRITERIA: (definitions)	DEFAULT:
<input type="checkbox"/> GEOGRAPHIC COORDINATES	- whole world
<input type="checkbox"/> OBSERVATION DATES - e.g., Year(s), Month(s), Day(s)	- all years/months/days
<input type="checkbox"/> DATASET - e.g., OSD, CTD, XBT	- OSD only
<input type="checkbox"/> MEASURED VARIABLES - e.g., Temperature, Salinity, Nutrients	- all available variables
<input type="checkbox"/> BIOLOGY - e.g., Phytoplankton, Zooplankton	- all available plankton
<input type="checkbox"/> DEEPEST MEASUREMENT	- all depths
<input type="checkbox"/> COUNTRY	- all countries
<input type="checkbox"/> SHIP/PLATFORM	- all ships/platforms
<input type="checkbox"/> CRUISE	- all cruises
<input type="checkbox"/> ACCESSION #	- all accessions
<input type="checkbox"/> PROJECT	- all projects
<input type="checkbox"/> INSTITUTE	- all institutes
<input type="checkbox"/> DATA EXCLUSION USING WOD QUALITY CONTROL FLAGS	- no exclusion
<input type="checkbox"/> DATA ADDITIONS	- WOD09 released data

Build a query

Reset



Northern edge

Western edge Eastern edge

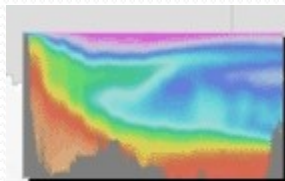
Southern edge

or

and return to the main inventory query.

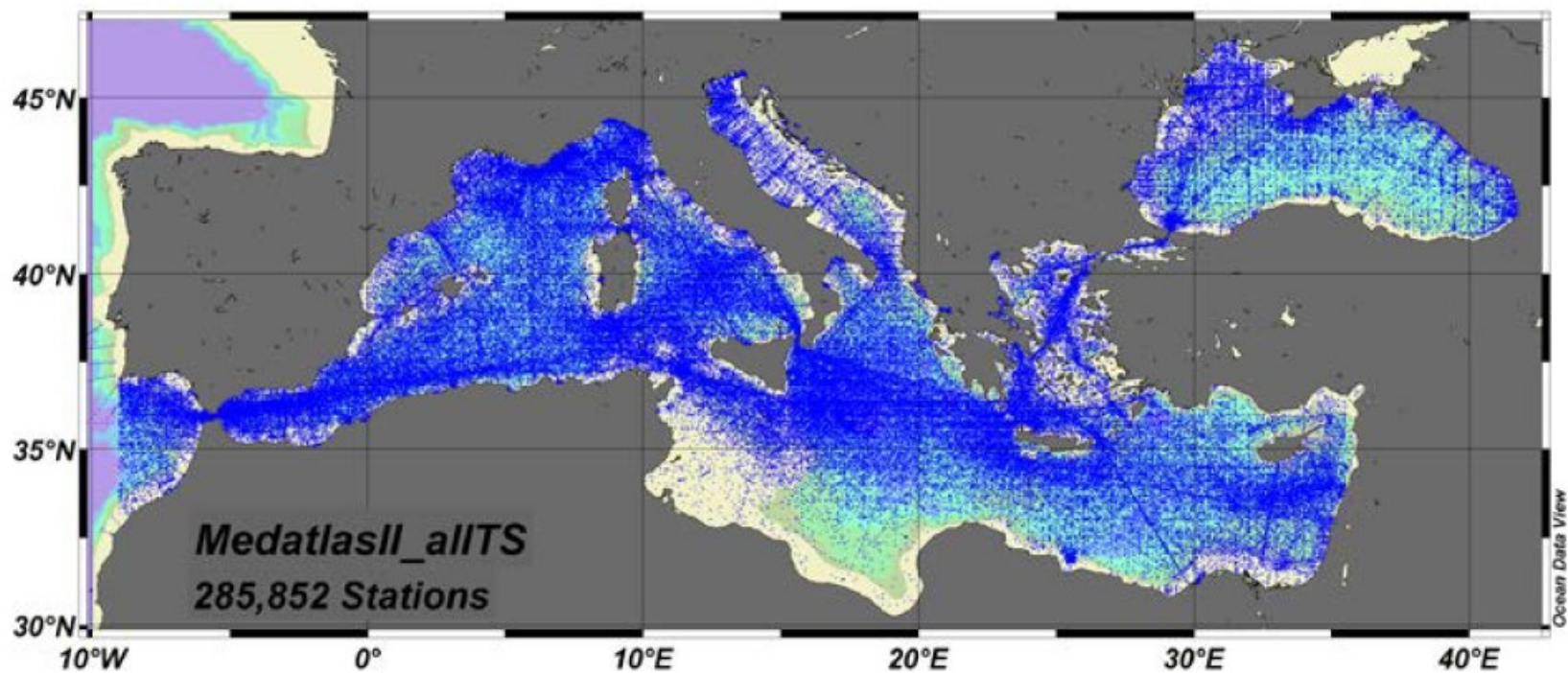
Vizualizácia

- Vlastný dátový formát
- Csv tabuľky
- Ocean Data View software
- WODo5 Browser (java) – prehliadanie tabuliek



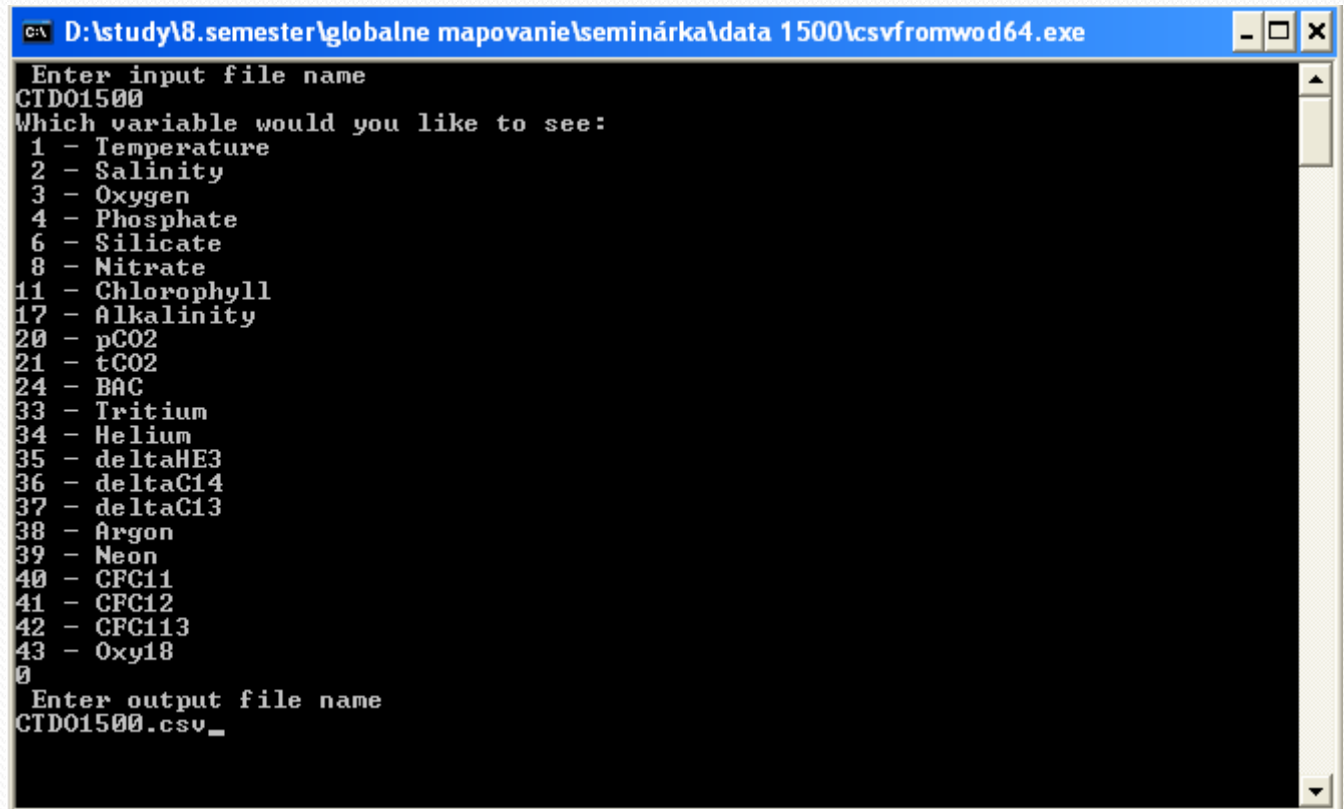
Ocean Data View

- Zobrazenie máp
- Výpočty štatistík a indexov



Použitie v ArcGis

Konverzia wod formátu do .csv (utilita csvfromwod.exe)



```
cmd D:\study\8.semester\globalne mapovanie\seminárka\data 1500\csvfromwod64.exe
Enter input file name
CTD01500
Which variable would you like to see:
1 - Temperature
2 - Salinity
3 - Oxygen
4 - Phosphate
6 - Silicate
8 - Nitrate
11 - Chlorophyll
17 - Alkalinity
20 - pCO2
21 - tCO2
24 - BAC
33 - Tritium
34 - Helium
35 - deltaHE3
36 - deltaC14
37 - deltaC13
38 - Argon
39 - Neon
40 - CFC11
41 - CFC12
42 - CFC113
43 - Oxy18
0
Enter output file name
CTD01500.csv_
```



Zhrnutie

- Bohatý zdroj presných dát, s kontrolou kvality
- Vhodný pre odborníkov (orientácia v odbore)
- Treba presne vedieť čo hľadáme
- Problematická vizualizácia a prevody dátových formátov

Zdroje

- WOD search
<http://www.nodc.noaa.gov/OC5/SELECT/dbsearch/dbsearch.html>
- WOD utilities
http://www.nodc.noaa.gov/OC5/WOD09/wod_programs.html
- Ocean data view <http://odv.awi.de/en/data/ocean/>



Ďakujem za pozornosť