Step by step manual to install Intel® FORTRAN Compiler 9.0 and to compile MOHID Water

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Installing Intel® FORTRAN Compiler 9.0

18 Steps to install the compiler.

- 1) To proceed with the installation you need to have Microsoft Visual Studio .NET 2003 in your computer. To install it get the installation DVD's.
- 2) Copy entire content of folder <u>\\Luis\Software\Programming\Compilers\Intel</u> <u>Fortran\Intel Fortran</u> (Figure 1), to a directory in your hard drive.



- 3) Run the executable file that you copied. It will show up the introducing window: click [*Next*].
- 4) Next window showing up is the one in Figure 2. It has the path for the installation files. Click [*Next*].

.ocation to Save Files Where would you like to save your files?	i d	
Please enter the folder where you want exist, it will be created for you. To cont	these files saved. If the inue, click Next.	folder does not
Save files in folder:	outros Compilov 20	
		Change

Figure 2 – Installation path

5) Wait (Figure 3).

💐 Intel(R) Fortran Compiler 9.0 - Ins	tallShield Wizard		
Extracting Files The contents of this package are being	extracted.		4
Please wait while the InstallShield Wizar Fortran Compiler 9.0 on your computer.	d extracts the files neede This may take a few mor	d to install Intel(R) nents.	
Reading contents of package			
InstallShield			
	< Back Ne	xt > Cance	!

Figure 3 - Wait....installing

6) In this window click [*Next*] (Figure 4).



Figure 4 – Another window

7) A license is needed to install the compiler. In the window represented by figure 5 click [*More Options>>>*] and select [*provide a licence file*] (Figure 5). This file is "*commercial_for_w_C8V7-XNB8RJ9P.lic*", is located near the installation executable file.

° Int	tel(R) Software Setup Assist	ant		
E nte Plea	r Serial Number se enter your serial number for the	Intel(R) Visual Fortran Compiler 9.	0 for Windows*.	Intel [®] Software Developmen Produc
•	Use the existing license foun The Intel(R) Software Setup Assis can be used for installing the proc	d on the system <i>[recommence</i> tant has detected an existing valid luct.	fed] I license on the system	n that
ſ	Help me locate my serial number. Use this option if you have a seri The Intel(R) Software Setup Assistant verify your serial number. Please refer to Intel's <u>Privacy Policy</u>	('coox-cocococ) al number to install and register yo may attempt to connect to Intel(R) Reg regarding the collection and handling of M	ur software, jistration Center in order to your personal information ore Options >>	

Figure 5 – License

8) Browse for the file (Figure 6)

^l Int	tel(R) Software Setup Assistan	t 📃 🗖 🗖
Ente	r Serial Number	Intel [®] Software
Plea	ase enter your serial number for the Inl	tel(R) Visual Fortran Compiler 9.0 for Windows*. Developme
0	Use the existing license found o	on the system <i>[recommended]</i>
	The Intel(R) Software Setup Assistar can be used for installing the product	nt has detected an existing valid license on the system that t.
ē.	Provide your Serial Number	
E.	Help me locate my serial number.	(xxxx-xxxxxxxx)
	verify your serial number. Please refer to Intel's <u>Privacy Policy</u> reg	arding the collection and handling of your personal information.
•	Provide a license file	
	Use this option if you have obtained	a license file instead of a serial number.
		Browse
		*Other names and brands may be claimed as the property of othe
1.110	D) Coffigure Development Droducts	
htel(H	R) Surtware Development Products	

Figure 6 - Browse for license file

9) Browse for the file (Figure 7)



Figure 7 - Browse for license file

10) When Figure 8 appears you must install in this order the following components:
(i) Visual Fortran Compiler for 32 bit (1st on the list); (ii) Debugger (4th on the list); (iii) Visual Fortran Compiler Integrations in Microsoft Visual Studio (5th on the list); (iv) Array Visualizer (6th on the list); The components will be installed one at a time, so this window will remain in background each time a component is installed.

🔞 Intel(R) Software Setup Assistant
Tool Selection Intel® Please click the Install button for the tool you wish to install. Development
Install Install Installs only on IA-32 systems.
Install Installs on IA-32-based systems and IA-32-based systems with Intel(R) EM64T support.
Install Installs only on Itanium(R)-based systems.
Install Intel(R) Debugger Command-line and GUI-based Debugger.
Install Intel(R) Visual Fortran Compiler Integrations in Microsoft Visual Studio* Integrate your compiler into Visual Studio*. Installs only on IA-32 systems.
Install Intel(R) Array Visualizer View and graph array data.
*Other names and brands may be claimed as the property of others
Intel(R) Software Development Products < Back

Figure 8 - Installation window

11) In every component, just click "Next" and leave all default options. When asked, install compiler for all users in the computer, and perform a complete installation. When a window like in Figure 9 appears, please select the **"Automatically update environment variables"** option.

Intel(R) Visual Fortran Compiler 9.0	
Environment Variables Automatically update environment variables.	Software Developme Produ
Setup can update the system environment variables PATH, LIB at these updates if you build from the command line and do not invo directly or by using an appropriate Build Environment shortcut in I Compiler 9.0 program group.	nd INCLUDE. You need ke IFortVars.bat, either the Intel(R) Fortran
You also need to update the PATH if you run applications built ag DLLs. If you do command line builds and do not use IFortVars.bat Microsoft Platform SDK* updates to these environment variables.	ainst the Intel Fortran ;, be sure to perfrom the
For more information, see the Intel Visual Fortran Compiler user's	guide.
Automatically update environment variables.	
el(R) Software Development Products	

Figure 9 - Enviroment variables

12) Just click "Next" to continue installation.

.

Intel(R) So	ftware Setup Assistant			
Tool Selectio Press Next wh	n en you are finished.			Intel [®] Software Developmen Produc
Modify	Intel(R) Visual Fortran Compiler [Installed] Installs only on IA-32 systems.	for 32-bit and Ita	nium(R)-based a	pplications.
Install	Intel(R) Visual Fortran Compiler, Installs on IA-32-based systems and I	, Extended Memo (A-32-based system:	r y 64 Technology s with Intel(R) EM64	Edition T support.
Install	Intel(R) Visual Fortran Itanium(Installs only on Itanium(R)-based syst	R) Compiler for It ems.	anium(R)-based	applications
Modify	Intel(R) Debugger [Installed] Command-line and GUI-based Debugg	jer.		
Modify	Intel(R) Visual Fortran Compiler [Installed] Integrate your compiler into Visual Stu	Integrations in M udio*. Installs only o	licrosoft Visual St n IA-32 systems.	udio*
Modify	Intel(R) Array Visualizer [Instals View and graph array data.	led]		
		*Other names and bran	ds may be claimed as	the property of othe
ntel(R) Softwar	e Development Products			
		< Back	Next >	Cancel

Figure 10 - Just after installing 4 components

13) After installing the 4 components, just click Next to finish (Figure 10). In the following window (Figure 11), click Finish.

		arroquets	
Intel(R) Software Setup As	sistant		
hank you for your interest in Please click the Next button to star	intel(R) Software Developmen t the installation.	t Products	Intel [®] Software Developm Produ
intel(R) Visual Fortra	an Compiler 9.0 for W	indows*	
nstalled Yersion: 9.0 (partial) Jseful Links Lelease Notes Leadme nstallation Guide roduct Web Site Jupport Web Site	This product provides tools for Wi developers to create applications speeds on Intel(R) IA-32 process processors with Intel Extended M and Intel Itanium(R)-based proce	ndows* software that run at optimum ors, Intel(R) IA-32 emory 64 Technology, ssors.	
tel(R) Software Development Produ	*Other names and	I brands may be claimed as	the property of oth
	< Back	Finish	Cancel

Figure 11 - Last window

Compile Mohid Water with Intel FORTRAN Compiler 9.0

- 1) Please follow these instructions step by step and until the end.
- 2) Make sure you have installed in your computer the following software:
 - a. Microsoft Visual Studio .NET 2003
 - b. Intel Fortran Compiler 9.0
- 3) If you don't have both installed, please install them
- 4) Open Microsoft Visual Studio .NET 2003.
- 5) Select "New Project".
- 6) Select Intel® FORTRAN Projects and then "Console Application" (Figure 12). Call the project, for example, "MohidWater". Click OK.

New Project	
Project Types:	Templates:
Visual C# Projects	
Visual C++ Projects Setup and Deployment Projects Other Projects Visual Studio Solutions	Application Library Application
Intel(R) Fortran Projects	Static Library Windows Application
A Win32 console application	
Name: MohidWater	
Location: D:\Projectos\MOHID_V4-IFC	Browse
Project will be created at D:\Projectos\MOHID_V4-IF0	 C\MohidWater.
▼ Mor <u>e</u>	OK Cancel Help

Figure 12 – Create a new FORTRAN project

7) A window appears (Figure 13). Select option "Empty project". Click OK.



Figure 13 – New application settings

8) An empty project is created. Get all FORTRAN code files from SourceSafe and add them to the project (Figure 14). Right-click in the Source Files folder (in the project tree), and select "Add...Add New Item..."

	Solution Explorer - M	ohidV e1'(1 :er Files	Vater . project)	_	7	×
*:::	Add Ne <u>w</u> Item		A <u>d</u> d ►			
	Add Existing Item	Ж	Cu <u>t</u>			
*	New Fol <u>d</u> er	Đ	Сору			
		ß	<u>P</u> aste			
		\times	Remo <u>v</u> e			
			Rena <u>m</u> e			
		Ŀ.	Properties	1		

Figure 14 – Adding new items

9) You should by now have a project tree looking like Figure 15.



10) Now select "Project...Properties" and start editing your compilation settings. Please follow the figures below and set them EXACTLY as they are presented. Do not make additional changes in the settings unless you're testing some optimizations. Note that settings under "Debug" and "Release" configurations are slightly different. Please select "Release" configuration and apply this settings first.

nfiguration: Active(Release)	Platform: Active(Wi	n32) Configuration Mana	ager.
Configuration Propertie 🔨	Suppress Startup Banner	Yes	
General	Additional Include Directories	D:\Projectos\MOHID_V4-IFC\HDF5\Libs	
Debugging	Debug Information Format	None	
🚔 Fortran	Optimization	Maximize Speed	
🏟 General	Preprocessor Definitions		
Optimization	Compile Time Diagnostics	Custom	
Preprocessor			
Code Generatio 📄			
Language			
Compatibility			
Diagnostics			
Data			
Floating Point			
External Procec			
Output Files			
Run-time			
Libraries	Suppress Startup Banner		
Command Line	Suppresses the display of the start	up banner. (/nologo)	
🔁 Lipker 🛛 💙			

Figure 16 - FORTRAN general settings

11) In Figure 16, "Additional Include Directories" defines the path to the folder where the HDF5 libraries will be placed.

MohidWater Property Pages		
Configuration: Active(Release)	Platform: Active(Win3	Configuration Manager
Configuration Propertie General Debugging Fortran General Optimization Preprocessor Code Generatio Language Compatibility Diagnostics Data Floating Point External Procec Output Files Run-time	Optimization Global Optimizations Inline Function Expansion Favor Size or Speed Omit Frame Pointers Optimize For Intel(R) Processor Use Intel(R) Processor Extensions Require Intel(R) Processor Extension Loop Unroll Count Parallelization Threshold For Auto-Parallelization Prefetch Insertion I/O Buffering	Maximize Speed Yes Only INLINE Directive Favor Fast Code Yes Pentium(R) 4 and additional Intel processors (see do Intel Pentium(R) 4 and compatible Intel pro o Intel Pentium(R) 4 and compatible Intel pro No 100 Yes Yes
Libraries Command Line Linker	Omit Frame Pointers Omits frame pointers and enables the [-])	e use of the EBP register in optimizations. (/Oy
		OK Cancel Apply

Figure 17 - Optimization settings

MohidWater Property Pages			
Configuration: Active(Release)	Platform: Active(Win32	2) Configuration Mana	ager
Configuration Propertie General Debugging Fortran General Optimization Preprocessor Code Generatio Language Compatibility Diagnostics Data Floating Point External Procec Output Flies Run-time Libraries Command Line Linker	Preprocess Source File Additional Include Directories Ignore Standard Include Path Default Include and Use Path Preprocessor Definitions Undefine Preprocessor Definitions Undefine All Preprocessor Definitions Preprocessor Definitions to FPP Only OpenMP Conditional Compilation	Yes D:\Projectos\MOHID_Y4-IFC\HDF5\Libs No Source File Directory No No No Yes D) prior to compilation. (/fpp)	
		OK Cancel /	Apply

Figure 18 - Preprocessor settings

12) In Figure 18, "Additional Include Directories" defines the path to the folder where the HDF5 libraries will be placed.

figuration: Active(Release)	Platform: Active(Win32	2) Configuration Manage
Configuration Propertie 🔨	Source File Format	Use File Extension
General	Fixed Form Line Length	132 Columns
Debugging	Pad Fixed Form Source Lines	No
🔄 Fortran	Enable Alternate PARAMETER Synta	Yes
General	Enable FORTRAN 66 Semantics	No
Optimization	Compile Lines With D in Column 1	No
Preprocessor	Process OpenMP Directives	Disable
Code Generatio 🔤	1000.	·
Language		
Compatibility		
Diagnostics		
Data		
Floating Point		
External Procec		
Output Files		
Run-time	~ ~ ~ .	
Libraries	Source File Format	
	Specifies the format of Fortran source (Ifree Ifixed)	code; the default is based on the file extension.

Figure 19 - Language settings

onfiguration: Active(Release)	Platform: Active(Win32	2) <u> </u>	nfiguration Manager
 Configuration Propertie General Debugging Fortran General Optimization Preprocessor Code Generatio Language Compatibility Diagnostics Data Floating Point External Procec Output Files Run-time Libraries Command Line Command Line 	Error Limit Treat Warnings As Errors Warn For Non-standard Fortran Treat Fortran Standard Warnings A: OpenNP Diagnostic Level Auto-Parallelizer Diagnostic Level Vectorizer Diagnostic Level Compile Time Diagnostics Warn For Undeclared Symbols Warn For Uncalled Routine Suppress Usage Messages Error Limit Specifies the maximum number of error a given file before compilation aborts.	30 No Fortran 95 No Loops, Regions, and Sections Parallel Loops Successfully Parallelized (1) Loops Successfully Vectorized (1) Custom Yes Yes Yes No Yes Yes No Yes No or-level or fatal-level compiler errors a (/error_limit:n)	ized (1)

Figure 20 - Diagnostics settings

	Platform: Active(Wi	IN32)	/lanager
Configuration Properties	Output File	\$(OUTDIR)/MohidWater.exe	
General	Show Progress	Not Set	
Debugging	Version	4	
🧰 Fortran	Enable Incremental Linking	No	
🗎 Linker	Suppress Startup Banner	Yes	
🍁 General	Ignore Import Library	No	
Input	Additional Library Directories	D:\Projectos\MOHID_V4-IFC\HDF5\Libs	
Embedded IDL Advanced			



13) In Figure 21, "Additional Include Directories" defines the path to the folder where the HDF5 libraries will be placed.

MohidWater Property Pages		
Configuration: Active(Release)	Platform: Active(Win32) Configuration Manager	·
Configuration Properties General Debugging Tortran Linker General Input Debug System Optimization Embedded IDL Advanced Command Line Resources Im IIDL Build Events Custom Build Step	Additional Dependence hdf5.lib hdf5_hl.lib hdf5_c.lib hdf5f90.lib szlib.lib zlib.lib v Ignore All Default Libr. No Ignore Specific Library Module Definition File Add Module to Assemt Embed Managed Reso Force Symbol Referen Delay Loaded DLLs Delay Loaded DLLs	
	OK Cancel Appl	y

Figure 22 - Linker input settings

14) Get the HDF5 libraries from Source Safe, and place them in the folder you've specified previously. Write down the names of the libraries in the "Additional Dependencies" text box. The names are: "hdf5.lib hdf5_hl.lib hdf5c.lib hdf5f90.lib szlib.lib zlib.lib"

onfiguration: Active(Release)	Platform: Active()	Vin32)	Configuration Manager
Configuration Properties General Debugging Fortran General Input Debug System Optimization Embedded IDL Advanced Command Line Resources MIDL Build Events Custom Build Step	SubSystem Heap Reserve Size Heap Commit Size Stack Reserve Size Enable Large Addresses Terminal Server Swap Run From Not Swap Run From Network	Console 0 0 6400000 0 Default Default No No	

Figure 23 - Linker system settings

15) Now, select the "Debug" configuration and apply the same settings except in the following figures (Figure 24, Figure 25)

onfiguration: [Debug	Platform: Active(Wi	n32) Configuration Man	ager
Configuration Propertie 🔨	Suppress Startup Banner	Yes	
General	Additional Include Directories	D:\Projectos\MOHID_V4-IFC\HDF5\Libs	
Debugging	Debug Information Format	Full	
🔁 Fortran	Optimization	Disable	
🏟 General	Preprocessor Definitions		
Optimization	Compile Time Diagnostics	Custom	
Preprocessor			
Code Generatio			
Language			
Compatibility			
Diagnostics			
Data			
Floating Point			
External Procec			
Output Files			
Run-time			
Libraries	Suppress Startup Banner		
Constant and Units	Suppresses the display of the starts	up banner. (/nologo)	
Command Line	suppresses are aspid, or are start		

Figure 24 - FORTRAN general settings (Debug)

Optimization Global Optimizations Inline Function Expansion	Disable No
Global Optimizations Inline Function Expansion	No
Inline Function Expansion	Disable
Envire Cite or Coood	Disdolo
Favor size or speeu	Default
Omit Frame Pointers	No
Optimize For Intel(R) Processor	Pentium(R) 4 and additional Intel processors (see do
Use Intel(R) Processor Extensions	None
Require Intel(R) Processor Extensio	None
Loop Unroll Count	
Parallelization	No
Threshold For Auto-Parallelization	100
Prefetch Insertion	Yes
I/O Buffering	Yes
	^
Omit Frame Pointers	
Contraction of the second	Optimize For Intel(R) Processor Use Intel(R) Processor Extensions Require Intel(R) Processor Extensio Loop Unroll Count Paralelization Threshold For Auto-Parallelization Prefetch Insertion I/O Buffering

Figure 25 - FORTRAN Optimization settings (Debug)

- 16) Select "Build Solution".
- 17) To perform optional compilation, just add the compilation pre-processor keywords in "Properties...Fortran...PreProcessor", in the "Preprocessor Definitions" text box. See keywords in table below.

LAGRANGIAN	excludes Modules Lagrangian + Jet + Oil
AIR	excludes Modules InterfaceWaterAir + Atmosphere
WAVES	excludes Module Waves
SEDIMENT	Modules SedimentProperties + Consolidation

18) IMPORTANT NOTE: you must copy "zlib1.dll" which is in the Source Safe folder "IntelLibs", to "C:\Windows\system\" in order for the model to run. This is annoying but necessary, for now, until another solution is found.