

# FAST Adapter

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## FAST

FAST is a two-dimensional model for tsunami calculations.

## FAST Module Adapter

This page describes the FAST module adapter, its functions, and provides an example for configuring a FAST run in FEWS.

## FAST adapter

Model adapter for running a FAST model from Delft-FEWS.

Class names:

`nl.deltares.fast.FastPreAdapter`  
`nl.deltares.fast.FastPostAdapter`

## Notes for users

`FastPreAdapter`

- For all files that are written by this adapter, if the file to be written already exists, then it will be overwritten.
- This program writes log messages to log file called `Fast_Pre_Adapter.log`.
- This program uses the information in the specified netcdf run file as input and uses this information to do the following:
- Replace the tag `$WAVE_HEIGHT$` in template file (`cil0_30mv3_TEMPLATE.xyz`) with a wave height value from the exported netcdf file from FEWS.

`FastPostAdapter`

- For all files that are written by this adapter, if the file to be written already exists, then it will be overwritten.
- This program writes log messages to log file called `Fast_Post_Adapter.log`.
- Converts model output (`cil0_30mv3_out.asc`) in esri grid format to fews netcdf grid format for T0.

## System requirements

- The model needs Matlab Compiler runtime 2013b x64 v8.2 to be installed
- The adapter needs Java version 1.7 or higher.
- The adapter needs the following Java libraries:
  - `castor-0.9.5.jar`
  - `commons-httpclient-3.0.1.jar`
  - `Delft_Util.jar`
  - `fews-FAST-adapter.jar`
  - `log4j-1.2.14.jar`
  - `netcdf-4.2.jar`
  - `slf4j-api-1.5.6.jar`
  - `slf4j-log4j12-1.5.6.jar`
  - `xercesImpl.jar`

## Example configuration

A complete example model run configuration file can be found here: [FastAdapterRun.xml](#)

## Start up activities

As a first activity it can be useful to delete all files present in the workDir, if for example it would be filled with files from a previous run.

#### start up activities

```
<startUpActivities>
  <purgeActivity>
    <filter>workDir*</filter>
  </purgeActivity>
</startUpActivities>
```

## Export activities

The first steps in the general adapter run are the data set, netcdf and run file export activities. The <exportDataSetActivity> will extract a zip file with the module instance id as file name located in "ConfigModuleDataSetFiles\" of the FEWS environment to the workdir. The <exportNetcdfActivity> will be a netcdf file which can have any name containing a variable called wave\_height. The <exportNetcdfRunFileActivity> will be a netcdf run file that contains information needed by the pre adapter. The information will be automatically filled by the general adapter.

#### export activities

```
<exportActivities>
  <exportDataSetActivity>
    <moduleInstanceId>Run_FAST</moduleInstanceId>
  </exportDataSetActivity>
  <exportNetcdfActivity>
    <exportFile>wave_height.nc</exportFile>
    <timeSeriesSets>
      <timeSeriesSet>
        <moduleInstanceId>Run_FAST</moduleInstanceId>
        <valueType>scalar</valueType>
        <parameterId>WaveHeight</parameterId>
        <locationId>Dummy</locationId>
        <timeSeriesType>external historical</timeSeriesType>
        <timeStep unit="hour"/>
        <relativeViewPeriod unit="hour" start="0" end="0"/>
        <readWriteMode>add originals</readWriteMode>
      </timeSeriesSet>
    </timeSeriesSets>
  </exportNetcdfActivity>
  <exportNetcdfRunFileActivity>
    <description>This run file is passed as argument to FastPreAdapter</description>
    <exportFile>run.nc</exportFile>
  </exportNetcdfRunFileActivity>
</exportActivities>
```

## Execute activities

The next steps are the execute activities.

The first will be the pre adapter.

The second execute activity will be the module run.

The third execute activity will be the post adapter.

## execute activities

```
<executeActivities>
  <executeActivity>
    <command>
      <className>nl.deltares.fast.FastPreAdapter</className>
      <binDir>adapter\bin</binDir>
    </command>
    <arguments>
      <argument>run.nc</argument>
    </arguments>
    <logFile>
      <file>Fast_Pre_Adapter.log</file>
      <errorLinePattern>ERROR*</errorLinePattern>
      <warningLinePattern>WARN*</warningLinePattern>
      <infoLinePattern>INFO*</infoLinePattern>
      <debugLinePattern>DEBUG*</debugLinePattern>
    </logFile>
    <timeOut>99999999</timeOut>
    <ignoreDiagnostics>true</ignoreDiagnostics>
  </executeActivity>
  <executeActivity>
    <command>
      <executable>FASTrun.exe</executable>
    </command>
    <arguments>
      <argument>cil0b2</argument>
      <argument>cil0_30mv3</argument>
    </arguments>
    <timeOut>99999999</timeOut>
    <ignoreDiagnostics>true</ignoreDiagnostics>
  </executeActivity>
  <executeActivity>
    <command>
      <className>nl.deltares.fast.FastPostAdapter</className>
      <binDir>adapter\bin</binDir>
    </command>
    <arguments>
      <argument>run.nc</argument>
    </arguments>
    <logFile>
      <file>Fast_Post_Adapter.log</file>
      <errorLinePattern>ERROR*</errorLinePattern>
      <warningLinePattern>WARN*</warningLinePattern>
      <infoLinePattern>INFO*</infoLinePattern>
      <debugLinePattern>DEBUG*</debugLinePattern>
    </logFile>
    <timeOut>99999999</timeOut>
    <ignoreDiagnostics>true</ignoreDiagnostics>
  </executeActivity>
</executeActivities>
```

## Executing pre adapter

This program will read the run.nc input file and use the contents for instructions on which directory and files should be used to convert to the correct FAST input format.

The Pre adapter generates a log file called fast\_pre\_adapter.log, which can be read into FEWS by coupling line patterns to FEWS log messages. It uses the exported netcdf file to look for the latest non missing value of the wave height to write to cil0\_30mv3.xyz by replacing the tag \$WAVE\_HEIGHT\$ in cil0\_30mv3\_TEMPLATE.xyz:

#### cil0\_30mv3\_TEMPLATE.xyz

108.34958333	-7.83289859	\$WAVE_HEIGHT\$	900	1
108.35411600	-7.83289136	\$WAVE_HEIGHT\$	900	1
108.35859257	-7.83344007	\$WAVE_HEIGHT\$	900	1
108.36302258	-7.83258101	\$WAVE_HEIGHT\$	900	1
108.36729527	-7.83112279	\$WAVE_HEIGHT\$	900	1
108.37134559	-7.82910962	\$WAVE_HEIGHT\$	900	1
108.37528703	-7.82689069	\$WAVE_HEIGHT\$	900	1
108.37936617	-7.82496548	\$WAVE_HEIGHT\$	900	1
108.38335489	-7.82662508	\$WAVE_HEIGHT\$	900	1
108.38745431	-7.82846972	\$WAVE_HEIGHT\$	900	1

By replacing \$WAVE\_HEIGHT\$ with value 5 cil0\_30mv3.xyz will be:

#### cil0\_30mv3.xyz

108.34958333	-7.83289859	5.00	900	1
108.35411600	-7.83289136	5.00	900	1
108.35859257	-7.83344007	5.00	900	1
108.36302258	-7.83258101	5.00	900	1
108.36729527	-7.83112279	5.00	900	1
108.37134559	-7.82910962	5.00	900	1
108.37528703	-7.82689069	5.00	900	1
108.37936617	-7.82496548	5.00	900	1
108.38335489	-7.82662508	5.00	900	1
108.38745431	-7.82846972	5.00	900	1

## Executing model run

This activity runs the model (FASTrun.exe) in the workdir containing the model files with the input file names as arguments. The model creates the output file cil0\_30mv3\_out.asc which contains the grid information for FEWS.

#### module run execute activity

```
<executeActivity>
  <command>
    <executable>FASTrun.exe</executable>
  </command>
  <arguments>
    <argument>cil0b2</argument>
    <argument>cil0_30mv3</argument>
  </arguments>
  <timeOut>99999999</timeOut>
  <ignoreDiagnostics>true</ignoreDiagnostics>
</executeActivity>
```

## Executing post adapter

The post adapter converts model output (cil0\_30mv3\_out.asc) in esri grid format to fews netcdf grid format for T0. The name of the netcdf file will be the name configured for the netcdf import activity which is stored in the netcdf run file.

The post adapter writes log messages to log file called Fast\_Post\_Adapter.log which can be read into FEWS by coupling line patterns to FEWS log messages.

### post adapter execute activity

```
<executeActivity>
  <command>
    <className>nl.deltares.fast.FastPostAdapter</className>
    <binDir>adapter\bin</binDir>
  </command>
  <arguments>
    <argument>run.nc</argument>
  </arguments>
  <logFile>
    <file>Fast_Post_Adapter.log</file>
    <errorLinePattern>ERROR*</errorLinePattern>
    <warningLinePattern>WARN*</warningLinePattern>
    <infoLinePattern>INFO*</infoLinePattern>
    <debugLinePattern>DEBUG*</debugLinePattern>
  </logFile>
  <timeOut>99999999</timeOut>
  <ignoreDiagnostics>true</ignoreDiagnostics>
</executeActivity>
```

## Importing post adapter output

The last part of the general adapter run is importing the post adapter output.

### model run output import activity

```
<importActivities>
  <importNetcdfActivity>
    <importFile>postAdapterOutput.nc</importFile>
    <timeSeriesSets>
      <timeSeriesSet>
        <moduleInstanceId>Run_XBeach</moduleInstanceId>
        <valueType>grid</valueType>
        <parameterId>H_max</parameterId>
        <locationId>Fast</locationId>
        <timeSeriesType>external historical</timeSeriesType>
        <timeStep unit="nonequidistant"/>
        <readWriteMode>read complete forecast</readWriteMode>
      </timeSeriesSet>
    </timeSeriesSets>
  </importNetcdfActivity>
</importActivities>
```