Water Coach

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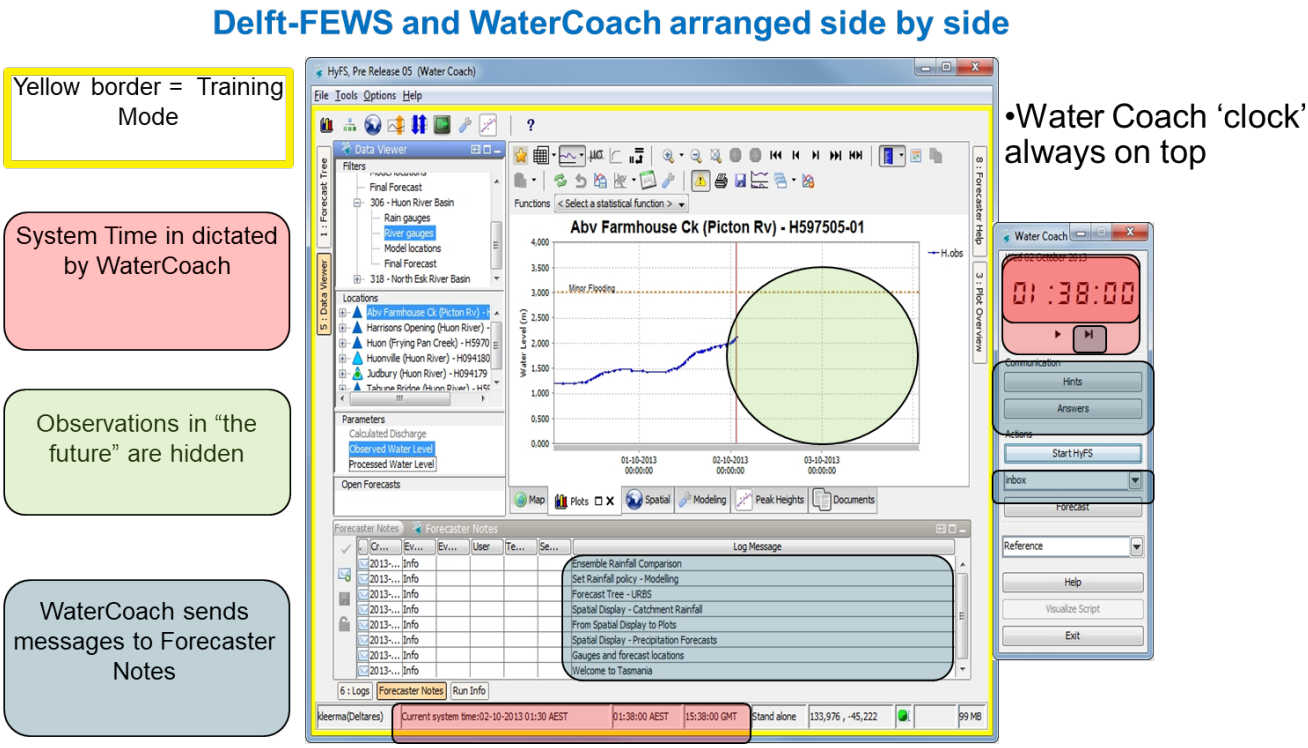
Introduction

WaterCoach provides a training environment for Delft-FEWS, to support the learning process and training of the operator based on real-world situations. It replicates the actual Delft-FEWS (operational) environment used during crisis pretty closely, as far as that's possible in a Stand Alone application.

When activated, the system can automatically move through time, revealing new data, forecasts, and other information to the training participants along the way. It provides a safe environment for users to practice with Delft-FEWS without fear of "breaking things".

Next to the application itself, we need a package containing a scripts and a scenario for a specific training or learning objective.

- Learning objective
- Components of a WaterCoach
  - Configuration
  - Scenario
  - Script
  - Different modes of WaterCoach
- Method to create a WaterCoach training



Learning objective

You can (and should) tailor a script and scenario combination to a specific learning objective. With some creativity WaterCoach can be used to reach the following range of learning objectives:

- Button course:
  - Learn to know your application, what does this button do?;
  - Refresh your knowledge of the application (at the start of the wet season)
  - Learn about new features added to your application in a recent update
- Content course:
  - Collect, analyze, and interpret data, and to formulate and support conclusions;
    - E.g. hydrological, hydrodynamic and meteorological model results as well as measurements.
  - Identify the strengths and limitations of models as predictors of behavior in the real world;
  - Apply appropriate software tools to analyze the relevant data;
  - Work effectively under time pressure and/or during unexpected events (e.g. technical problems).
- Procedural course:
  - Learn to follow the steps as outlined in your procedures;
  - Learn about changes to the procedures;
- Collaboration course:
  - Communicate effectively about forecasts with a specific audience, both orally and in writing;
    - This can include external partners / clients
  - Train with a groups of participants who can have different roles, e.g. model different parts of the river system during a rainfall event

Components of a WaterCoach

To reach these objectives, we have a few components to consider, which are described in more detail below.
The table provides some suggestions regarding the different components in relation to the different types of learning objectives identified.

Objective	Configuration	Scenario	Script	WC mode
Button	Current	Any	Recommended	Stand Alone
Content	Related to event	Event	Optional	SA; Participant mode
Procedural	Current?	Any?	Optional	SA; Participant mode
Collaboration	Related to event?	Event?	Optional	Participant mode; Multiple applications

Configuration

A Delft-FEWS configuration can change over time. This can entail minor changes like adding or removing a gauge location, but also major changes like replacing a model schematization or changing the primary NWP product.
With more and more organizations moving to continuous integration and development CI/CD
Depending on your learning objective it is more or less important to use the latest and greatest. If the learning objective is to upskill on data analysis (content course) the focus will be on training a relevant weather event. At the time of this particular event, a different configuration might have been in use. Especially if since then major changes have taken place, it is advisable to use the old configuration during the training. The old configuration can be stored in the ScenarioScriptDatabase or in the Open Archive.

- Latest config: Button course, Procedural?, Collaboration?
- Related to event: Content, Procedural?, Collaboration?

Scenario

A scenario contains all the relevant weather, water and model data (either real data or synthetic).
You can define multiple scenarios for a single WaterCoach, which can be stored in the ScenarioScriptDatabase.
Depending on your learning objective it is more or less important to work with data of a (historical or synthetic) event.
A scenario based on a historic weather event will require precise preparation to collect a correct and complete dataset. Such a scenario can be generated from the Open Archive, based on a replication of the centralDataBase during the event or even synthetic data.
A scenario based on any weather data can be generated without much attention to the when and what using the WaterCoach-on-the-fly approach

- Any: Button course, Procedural?, Collaboration?
- Event: Content, Procedural?, Collaboration?

Script

A script is an XML file that describes the story of what happens when Delft-FEWS is moved through time. This can include questions to and guidance for the user (think Button course), or news messages regarding failing gauges or a bulletin concerning a sunken ship (think Content course). Multiple scripts can be created for a single scenario (or historic event), each designed to meet different learning goals (such as how to respond to a certain type of flood event). This way you can make the most of an existing scenario.

- Script recommended: Button course
- Script optional: Content, Procedural, Collaboration

Different modes of WaterCoach

There are different ways to use and set-up WaterCoach.
A single Stand Alone Delft-FEWS application in WaterCoach mode can be used for an individual training.
Multiple SA applications in Participant mode can be used for a group training. This mode emulates an operational system, where participants can see each others' work, since all SA application use the same shared LocalDataStore.
It is even possible to have a joined training using multiple configs (i.e. different Delft-FEWS applications)

- Single SA: Button course, Content, Procedural
- Multiple SA: Content, Procedural, Collaboration
- Multiple Configs: Collaboration

Method to create a WaterCoach training

A classic WaterCoach training uses a Scenario based on a copy of the LocalDataStore of an Operator Client, created during or directly after an event. Alternatively, you can create a replicate of the centralDatabase. Either method will result in a single DataStore that can be used as the localDataStore in a WaterCoach application. This approach works really for Events that are short enough so that all relevant data remains available in the centralDatabase (i. e. their ExpiryTime is longer than the event lasts). It does require quick action at the end of the event to create the copy/replica. Scenario's created this way typically work best with the Config used at the time of the event. Therefore it is advised to also save a copy of the Config. See also presentation

WaterCoach-on-the-fly is a more recent option, where a Scenario is created based on data stored in the Open Archive.

	Classic WaterCoach				**WaterCoach-on-the-fly (since 2022.02)**
Objective	..	..	.	Collaboration	
Configuration	export from OC + manual adaptation	from repository + manual adaptation	download from Open Archive + manual adaptation	multi-user or multi-FEWS	automatic from Open Archive + automatic adaptation
Scenario	replicate database from OC	import raw data and run workflows	select and import from Open Archive	tag event and import from Open Archive	automatic from Open Archive

Script	just start and end time	add some questions	add experience levels	add interaction (if-then logic)	automatic
Prepare exercise folder (ScenarioScript Database)	manual	manual	manual	manual	local, from pop-up