

DEVELOPMENT OF A SURFACE- AND GROUNDWATER MODELLING RISK ASSESSMENT TOOL FOR PREDICTING EXPOSURE FROM PESTICIDES USED IN MAJOR CROPS IN NORWAY



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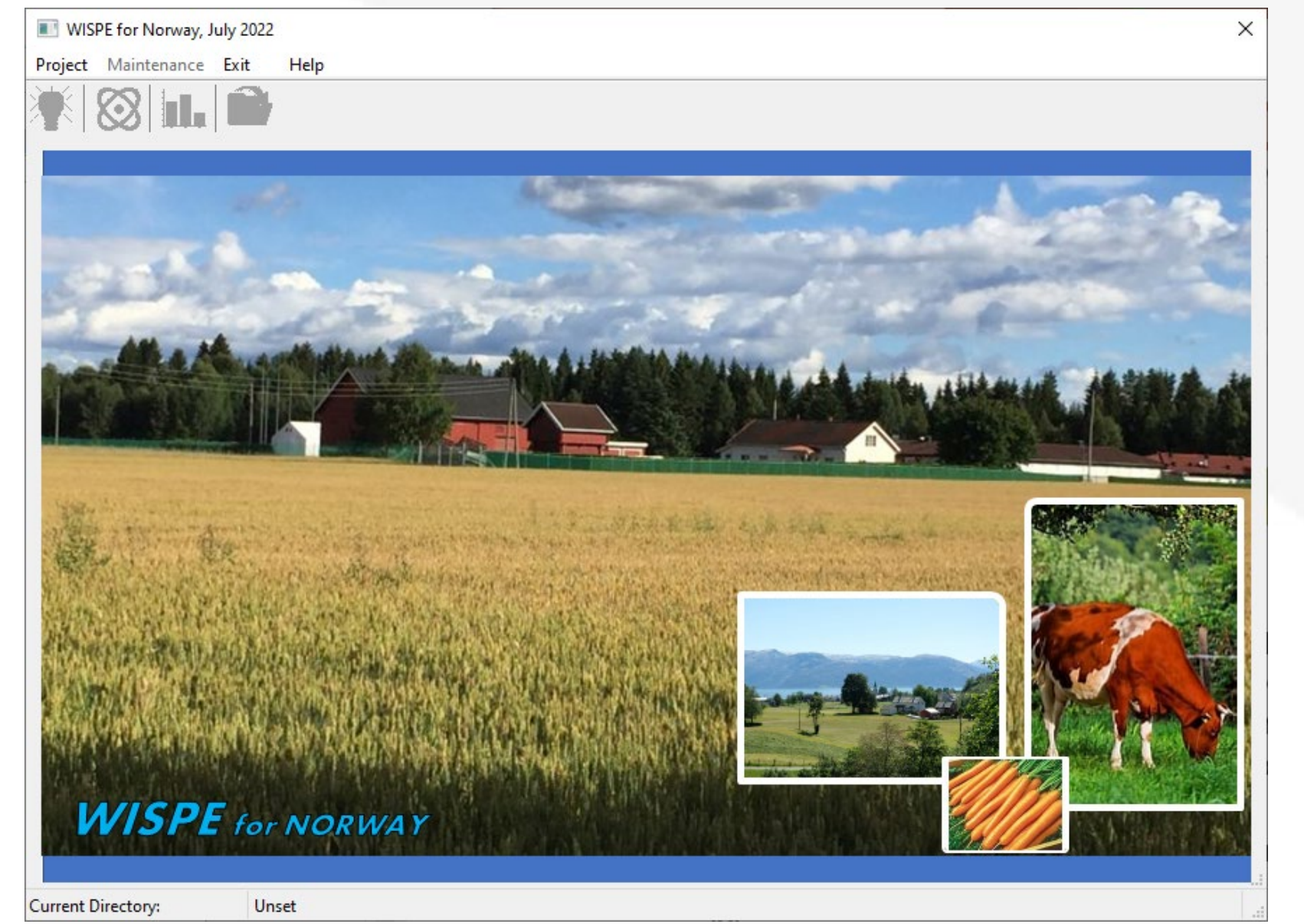
BACKGROUND AND OBJECTIVES

The risk assessment tool WISPE (World Integrated System for Pesticide Exposure) Norway was developed to include the environmental fate and transport models winPRZM and EXAMS. WISPE is a computer modelling tool developed to evaluate the potential impact of crop protection products on the environment. WISPE Norway makes it possible to estimate pesticide exposure in surface- and groundwater resources considering Norwegian conditions for 11 different crops. This version of WISPE Norway also includes all FOCUS groundwater scenarios and surface water scenarios. This poster presents the new user input interface and shows examples of the results.

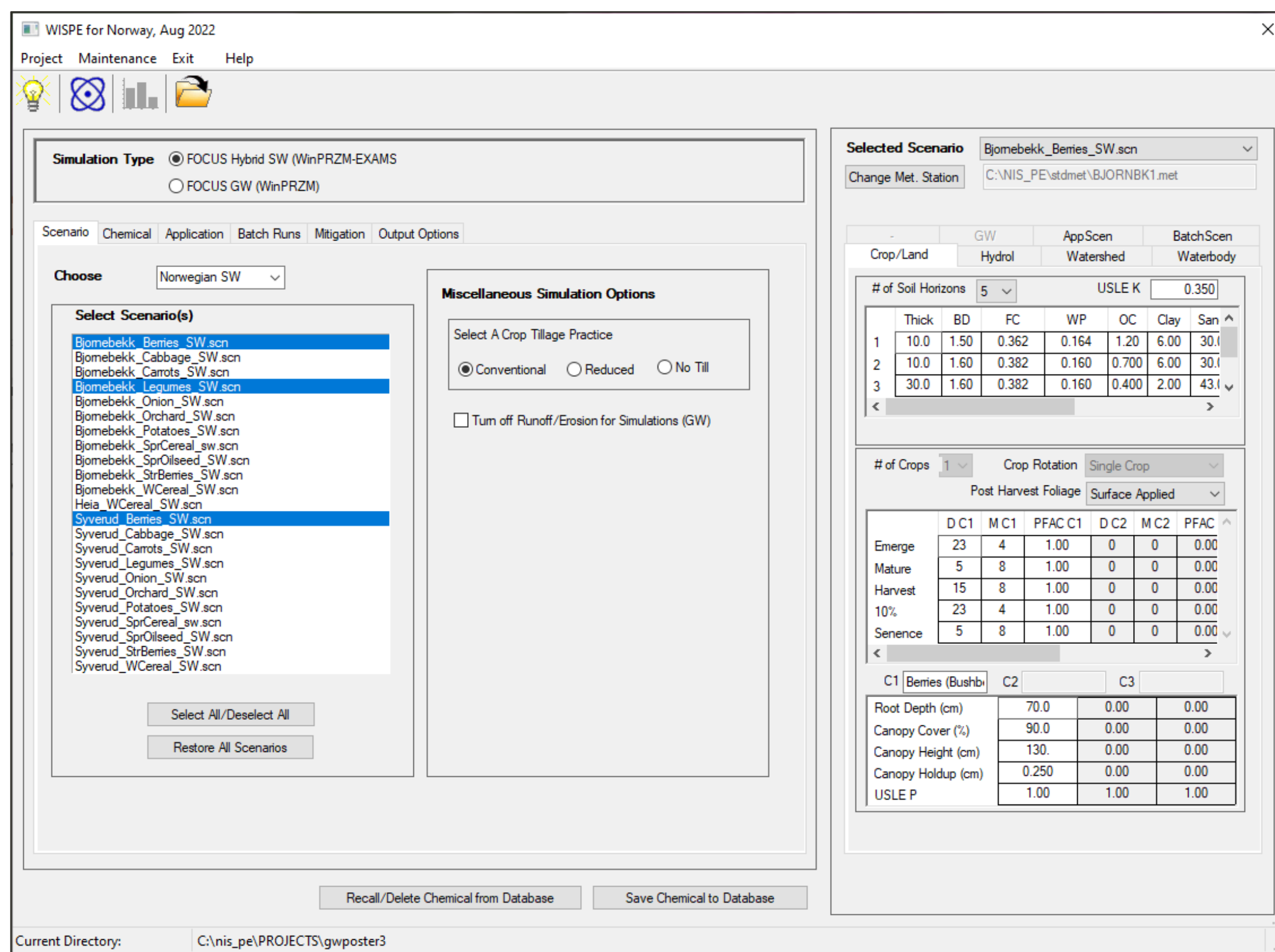
Originally developed in 2013, WISPE was updated in 2021 to be more flexible with adding scenarios, outputs, weather files and to utilize the most recent enhancements to WINPRZM. Additionally, WISPE is currently capable of linking WINPRZM/PRZM5 to EXAMS/VVWM and RICEWEQ to EXAMS using existing EPA scenarios.

CONCEPTUAL MODEL

The WISPE Norwegian model was designed to produce both SW and GW predictions following the FOCUS input and output guidelines. The GW model should be considered functionally equivalent to the standalone PRZM FOCUS tool currently in use. The SW tool is not a functional equivalent due to its use of the EXAMS model for SW. The pond environment yields similar results in most circumstances, but the reservoir (watershed) environment are configured differently.

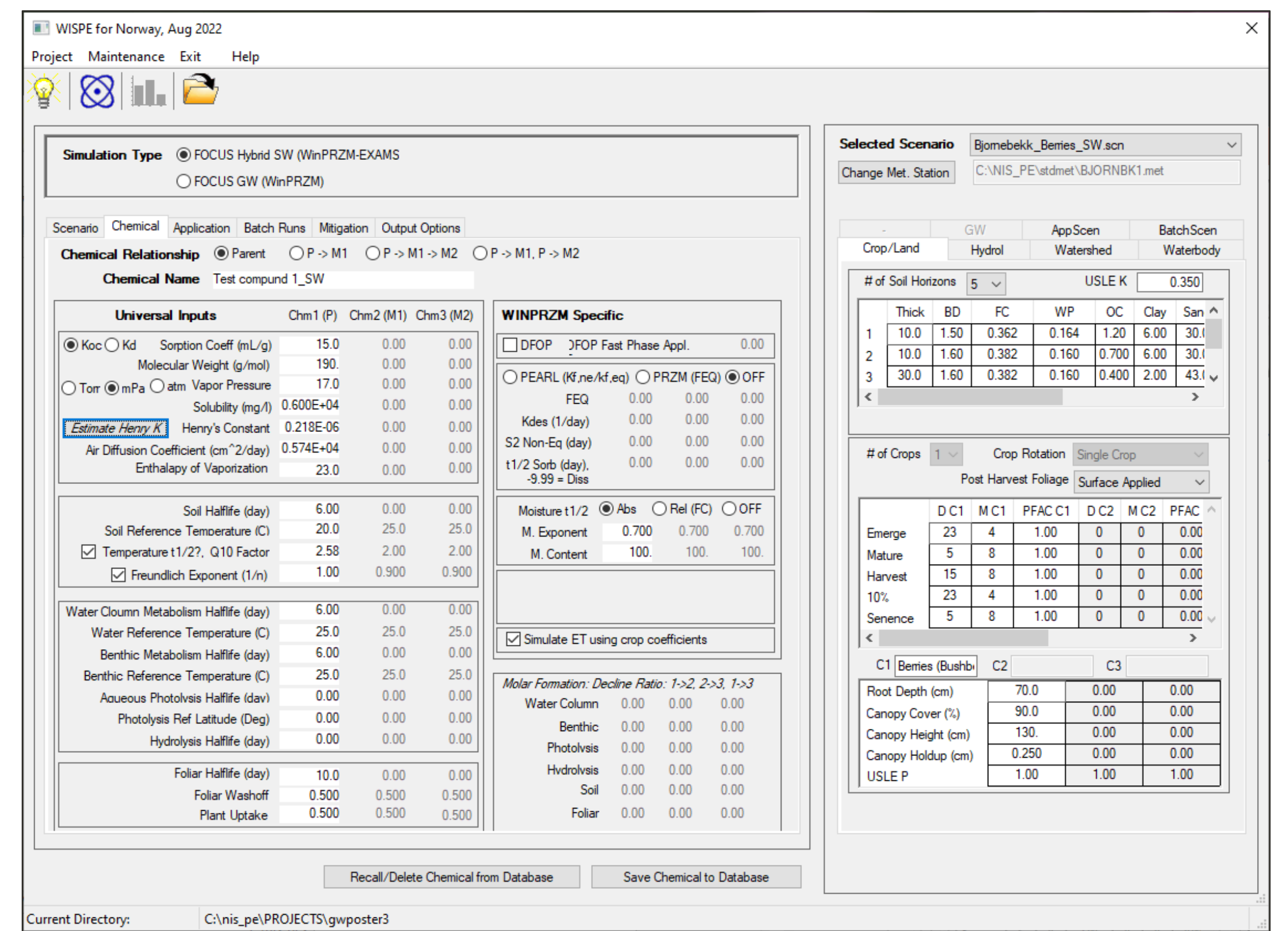


WISPE USER INTERFACE SCREENS FOR PREDICTING NORWAY ENVIRONMENTAL CONCENTRATIONS



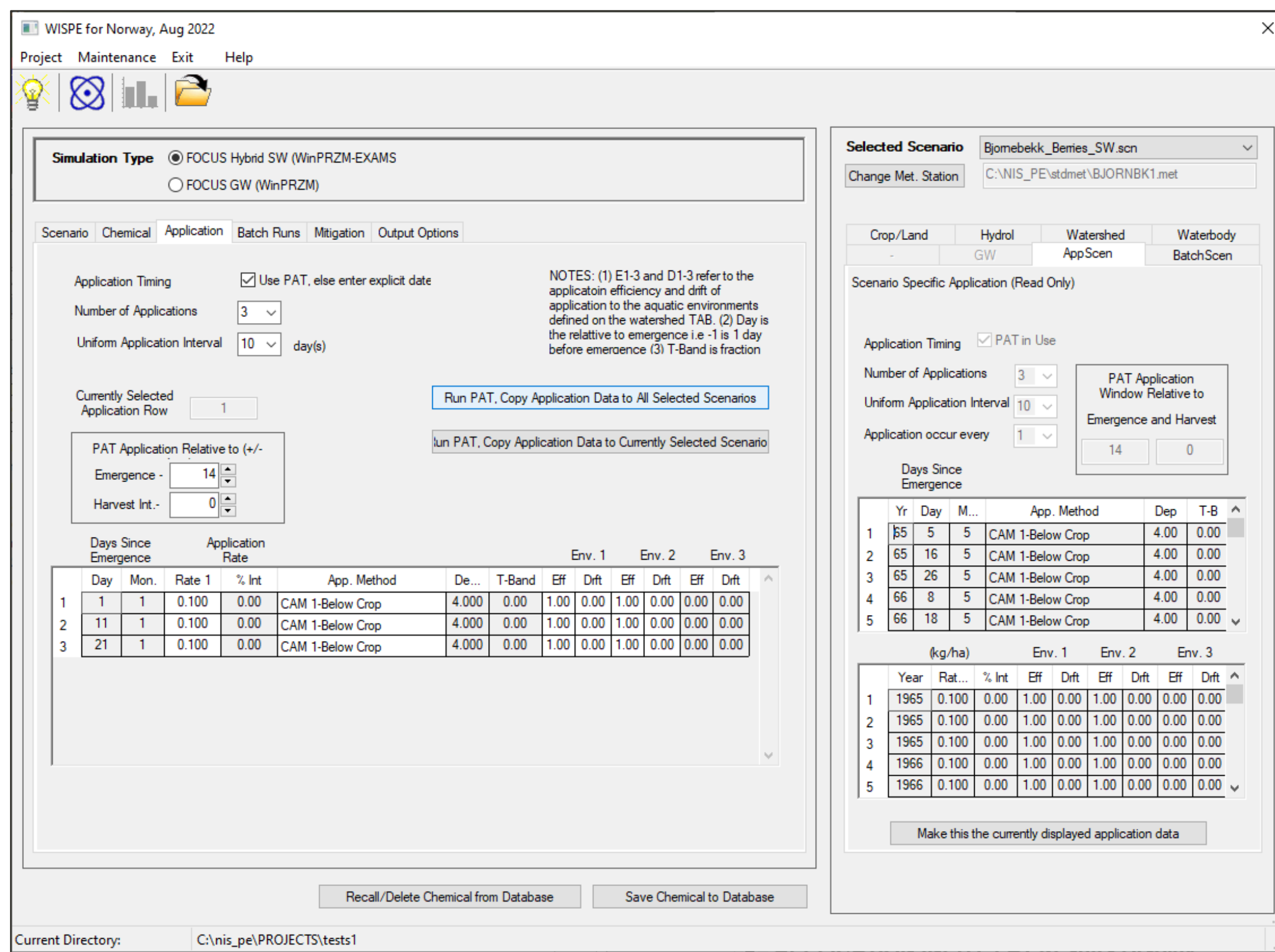
SCENARIO Selector, SOIL PROPERTY display:

The Scenario selector allows multiple scenarios/crop to be selected for simulation. The corresponding soil properties are displayed on the right side of screen. New scenarios can be created by changing displayed properties and saved into a personal USER directory or with Administrative rights into OFFICIAL directory.



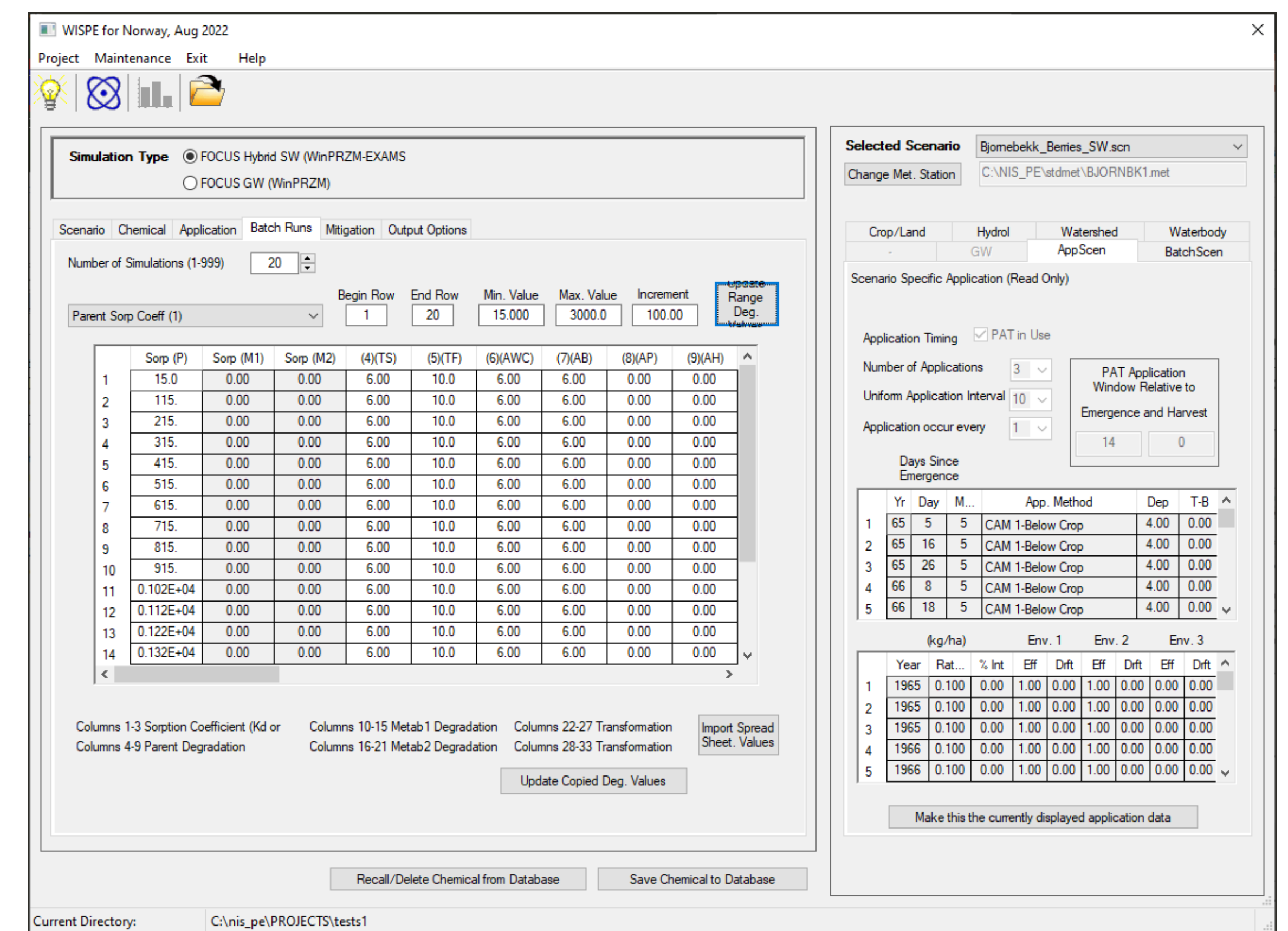
CHEMICAL INPUT, SOIL HYDROLOGY display:

The Chemical input screen allow for entry of required chemical properties. All Parent/metabolite properties may be entered at once. Soil Hydrology data such as Curve Numbers may be reviewed. Additional feature of WISPE is selection of alternate weather files for each scenario.



APPLICATION INPUT, PAT Results Display:

Complex application patterns may be easily created via input screen. When creating SW scenarios, a standalone version of the PAT tool is implemented. Results for each scenario are displayed. GW scenarios do not use the PAT tool and application data is directly entered.

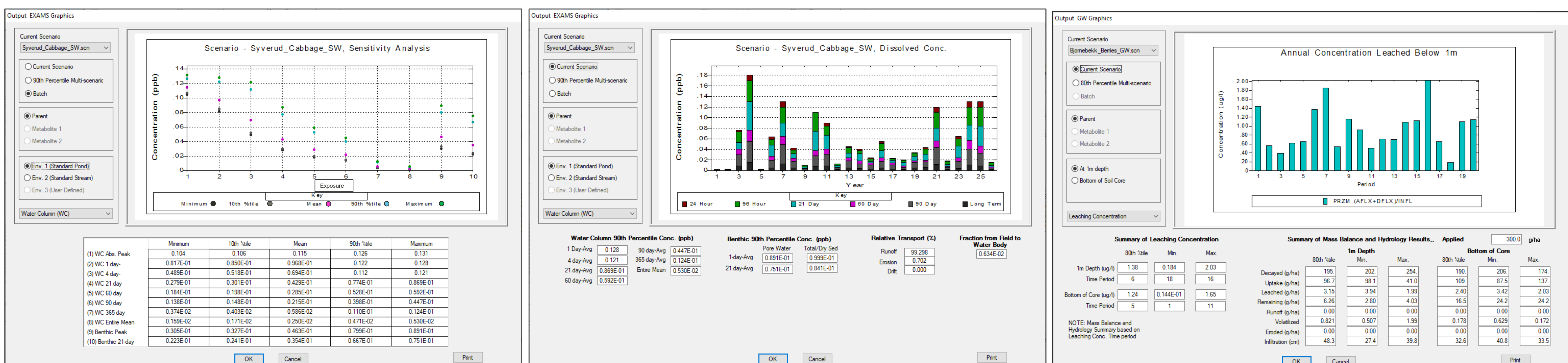


SENSITIVITY INPUT TOOL, AQUATIC ENVIRONMENT Display:

The sensitivity input tool can be used to evaluate and identify uncertainties in half-lives and sorption parameters for chemicals. This tool is particularly useful when evaluating parent/metabolites. Up to 1000 simulations may be performed for each selected scenario. Up to 3 aquatic environments may be selected for each surface water scenarios.

RESULTS AND VISUALIZATION

Results from several example model runs using inputs above can be summarized and visualized in several environmental compartments. First screen shows example output for a SW sensitivity batch run. Second screen shows SW aquatic and benthic time series results. Final screen shows sample annual groundwater concentrations at 1 meter.



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