

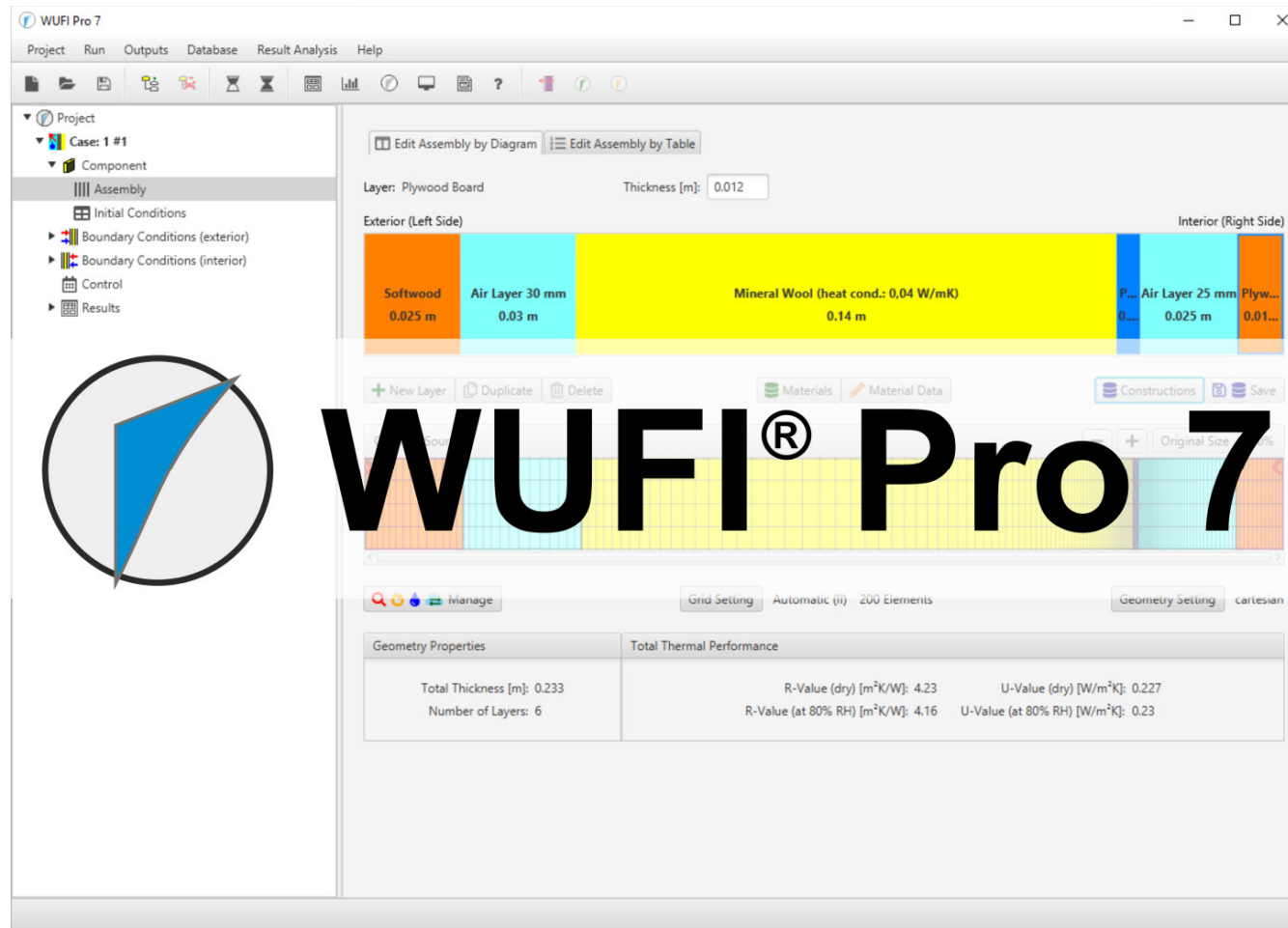
# WUFI® Pro 7: What's new?

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05.12.2024

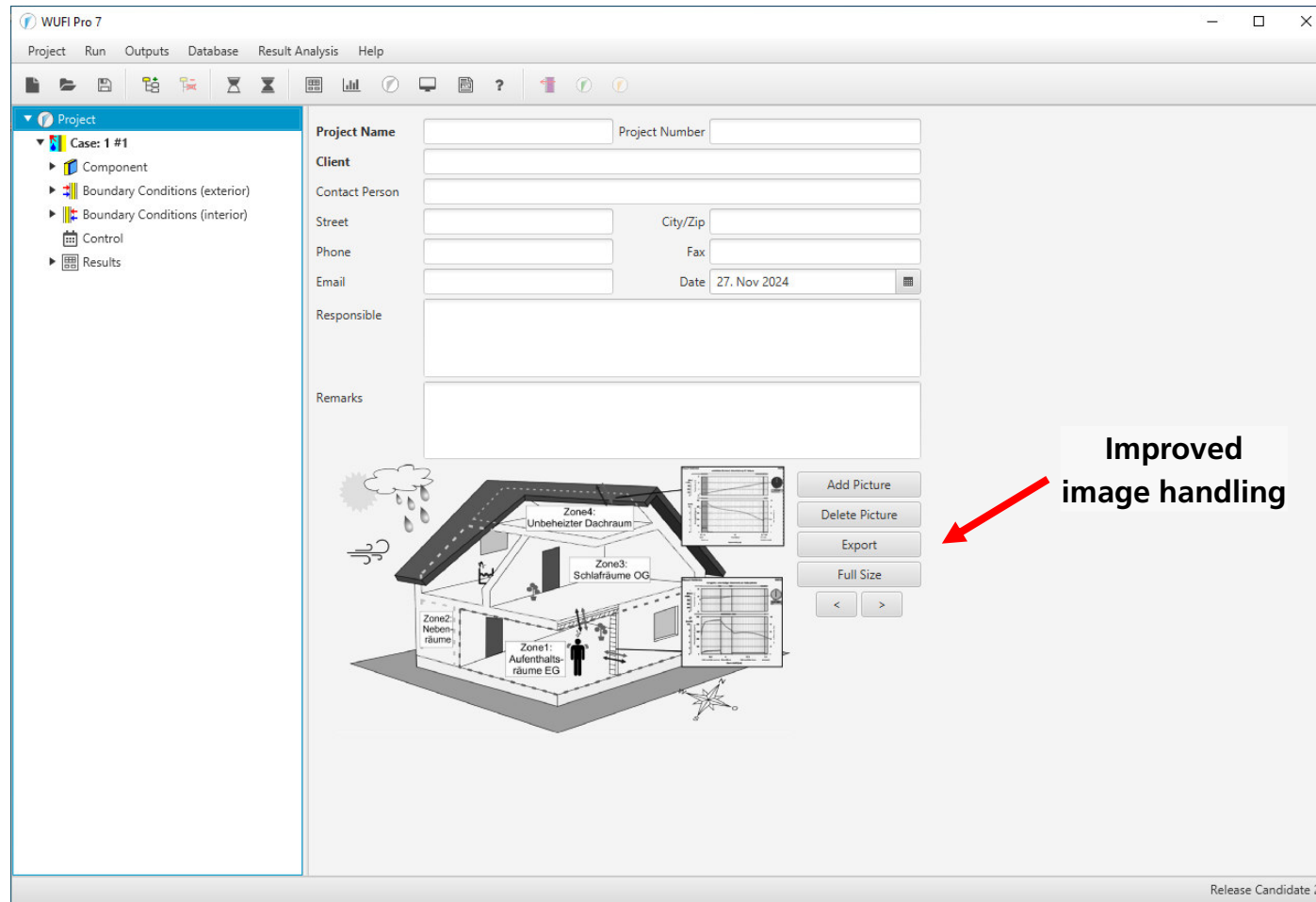
# WUFI® Pro 7.0

What's new?



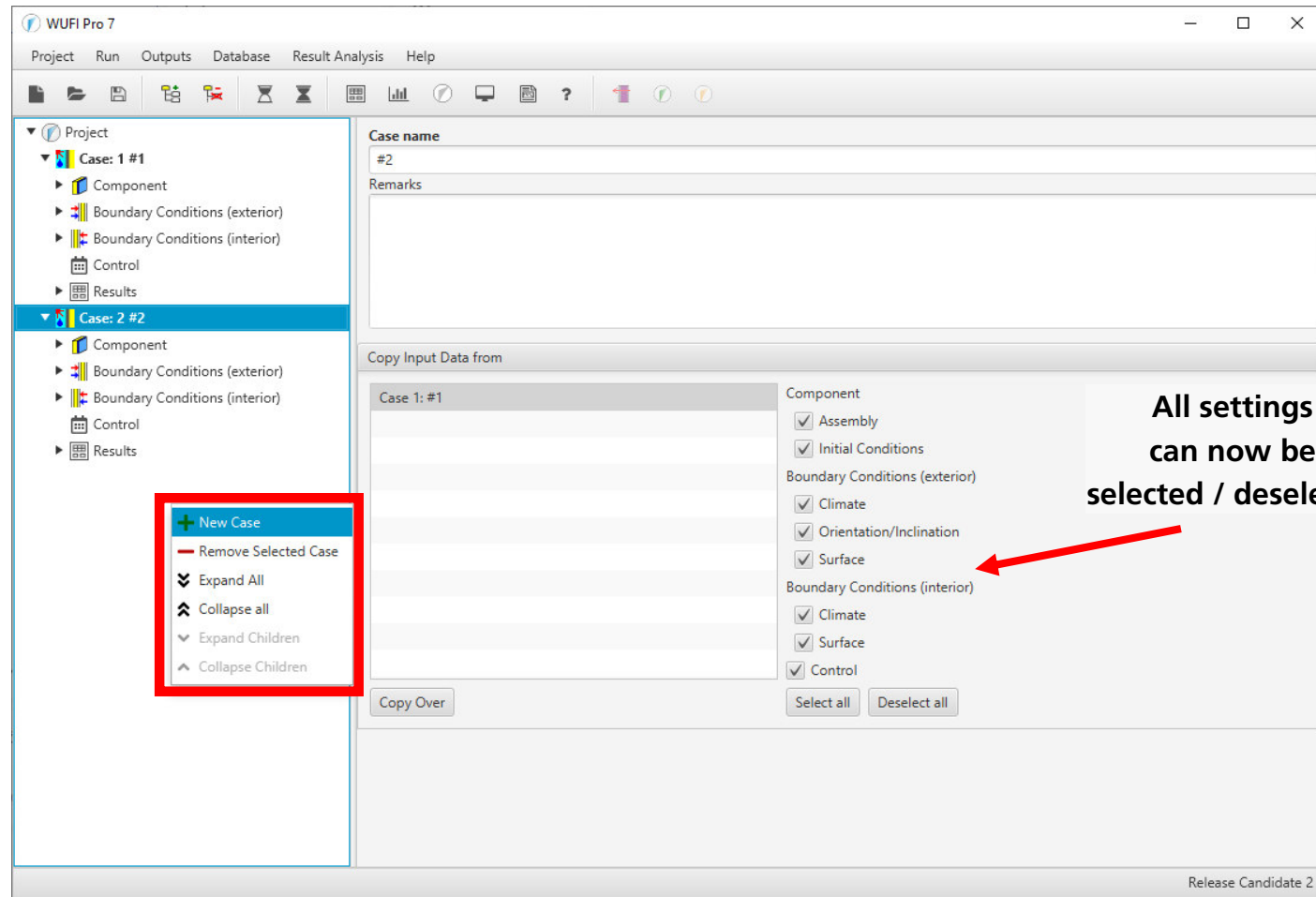
# New User Surface

## Project



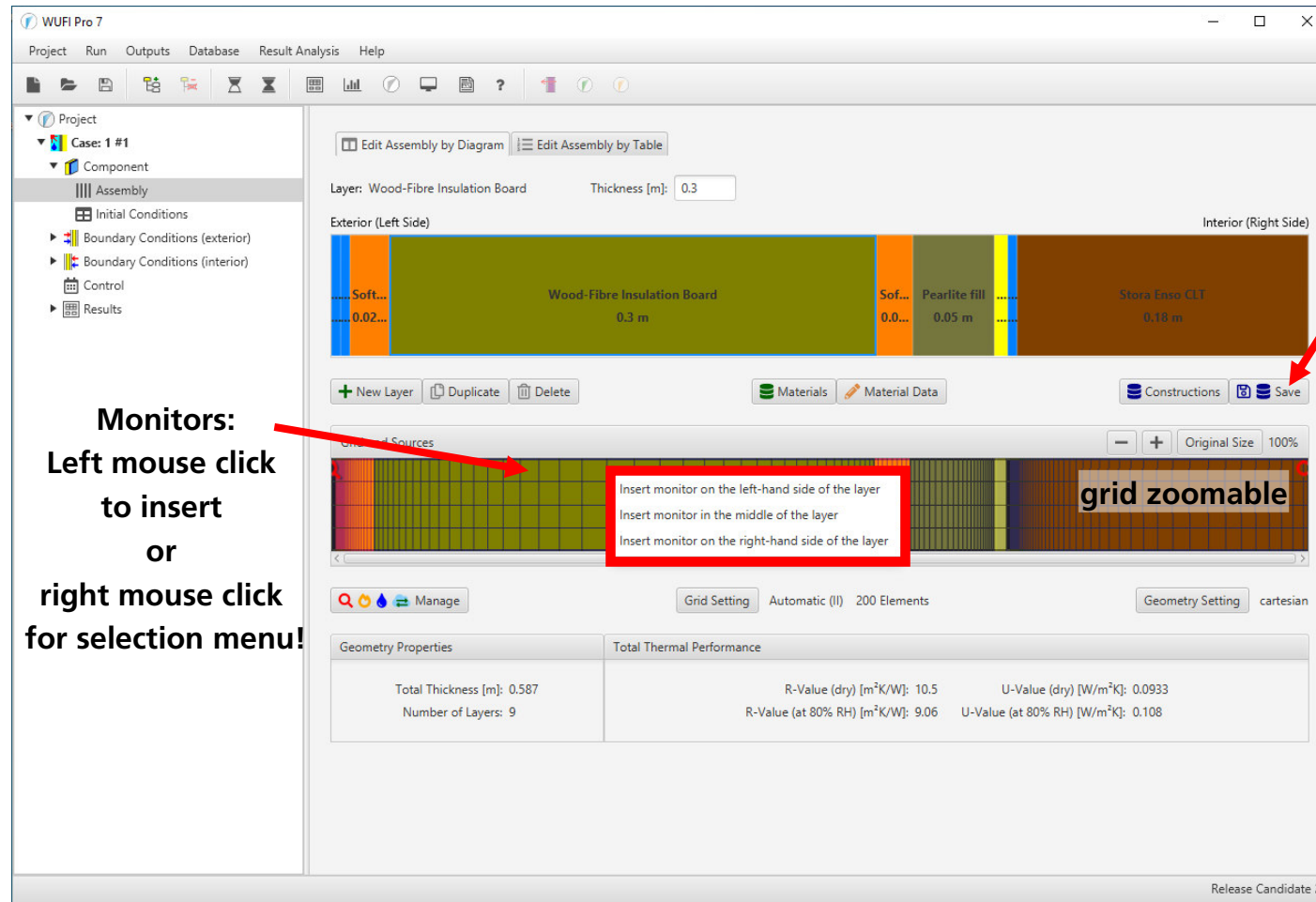
# New User Surface

## Cases



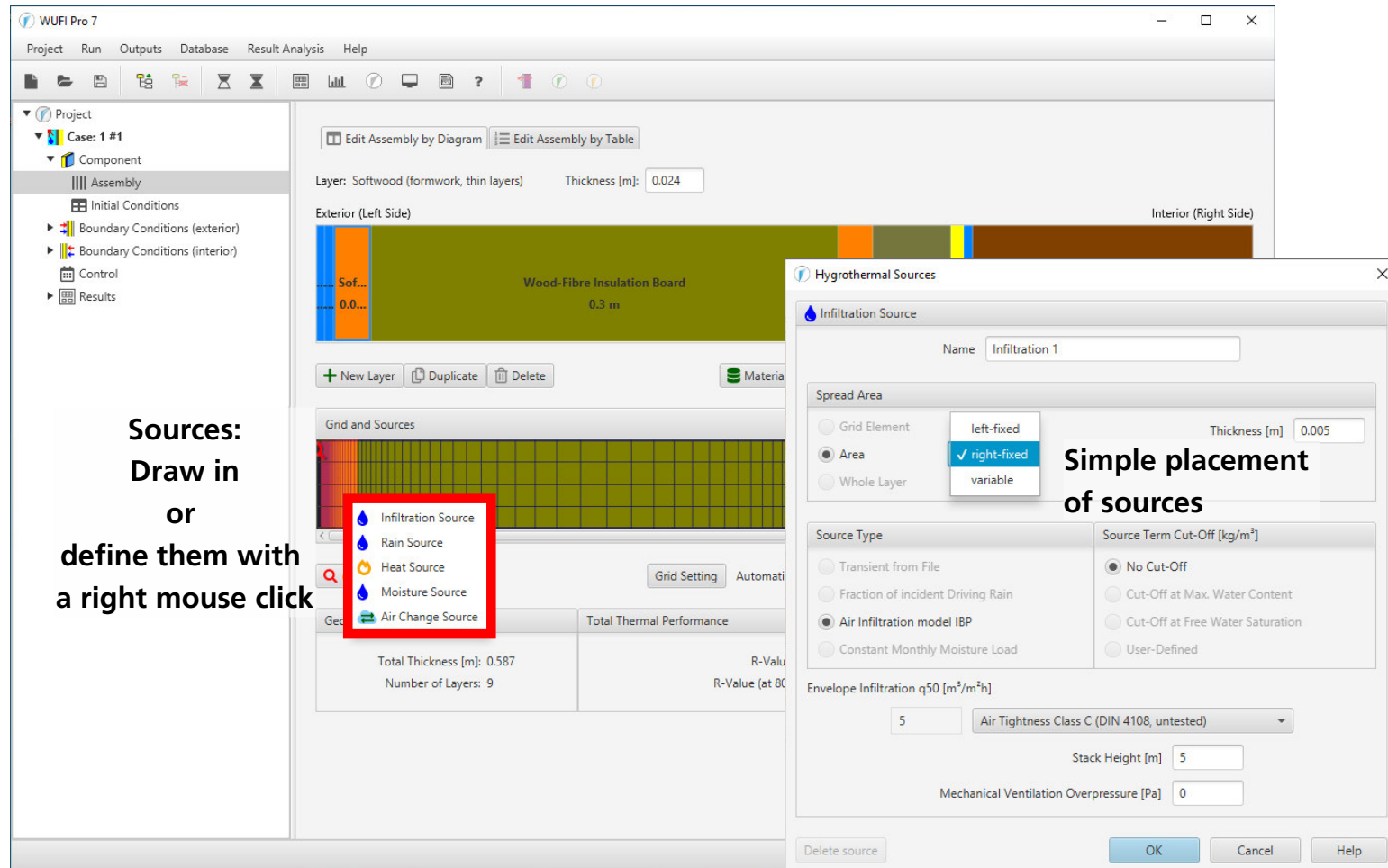
# New User Surface

## Assembly



# New User Surface

## Assembly



# Material Database

## Systems

WUFI Pro 7

Project Run Outputs Database Result Analysis

Project

Case: 1 #1

Component

Assembly

Initial Conditions

Boundary Conditions (exterior)

Boundary Conditions (interior)

Control

Results

Layers

Exterior

Grid

Geo

WUFI materials

Search materials

All Sources

WUFI

Fraunhofer-IBP

Concrete and Screeds

Green and Gravel Roofs

Insulating Materials

Masonry Bricks

Membranes

Mortar and Plaster

Natural Stone

Wooden Materials; Boards

Generic Materials

Australia & New Zealand Database

FabTrads, UCD Ireland Database

Japan Database

Korean Database

LTH Lund University, Sweden

MASEA Database, Germany

Materials for thermal calculations (fr

North America Database

NTNU Norwegian University of Scier

Obsolete Materials

University of Technology Vienna, Au

User defined

Recycle Bin

| Material Name                            | Bulk density<br>[kg/m³] | Porosity<br>[m³/m³] | Heat Cap.<br>[J/kgK] | Therm. Cond.<br>[W/mK] | Vap.Res.<br>[-] |
|------------------------------------------|-------------------------|---------------------|----------------------|------------------------|-----------------|
| generic gravel                           | 1400                    | 0.3                 | 1000                 | 0.7                    | 1               |
| generic substrate                        | 1500                    | 0.5                 | 1500                 | 0.9                    | 5               |
| ▶ Optigreen Economy Roof 1               |                         |                     |                      |                        |                 |
| ▶ Optigreen Economy Roof 2               |                         |                     |                      |                        |                 |
| ▶ Optigreen Light-weight Roof Solution 1 |                         |                     |                      |                        |                 |
| ▶ Optigreen Nature Roof Solution 1       |                         |                     |                      |                        |                 |
| ▶ Optigreen Pitched Roof 5° - 45°        |                         |                     |                      |                        |                 |

Hygrothermal Functions

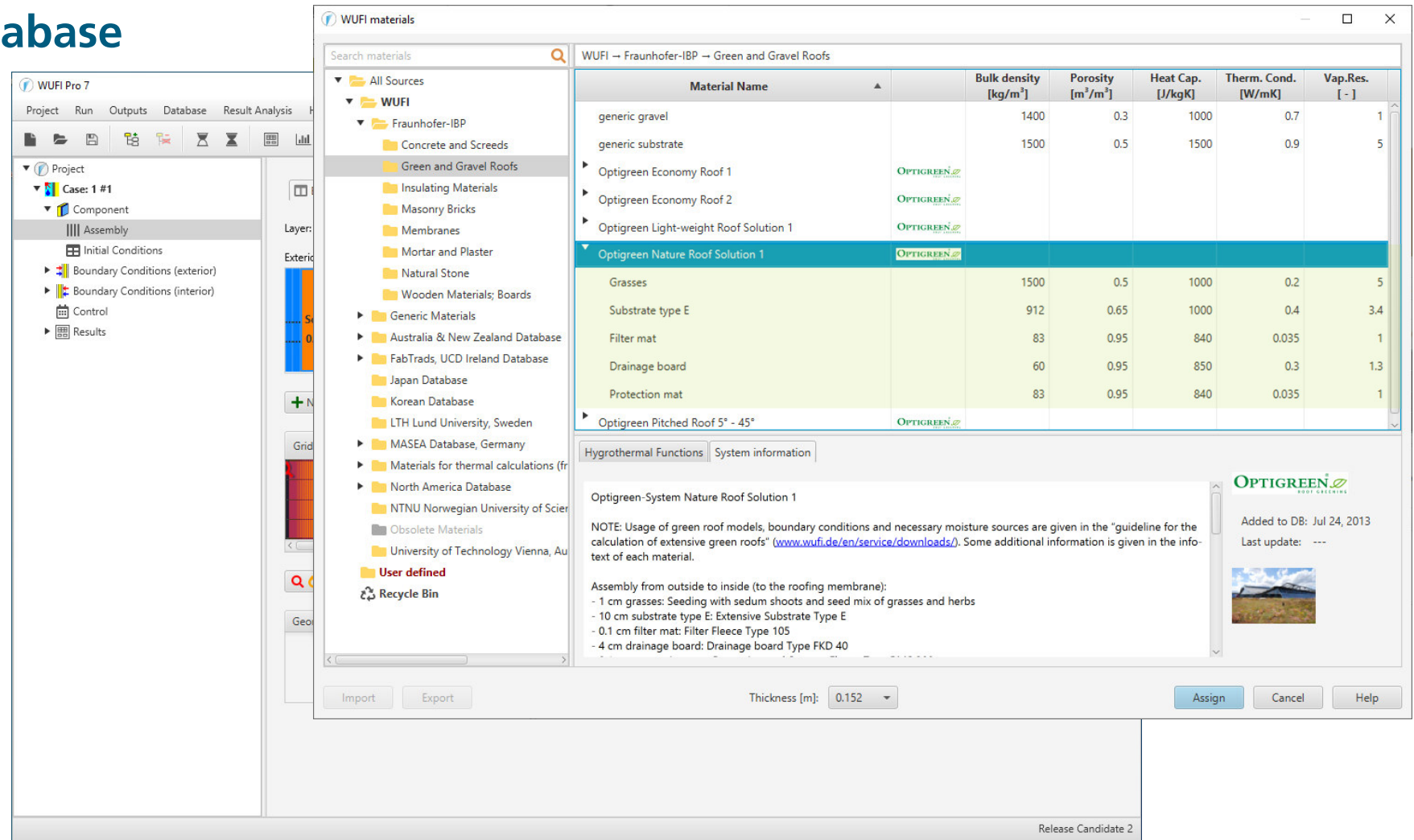
Material Information

Added to DB: ---  
Last update: ---

Import Export Thickness [m]: Assign Cancel Help

Systems can  
be opened

# Material Database Systems



WUFI materials

Search materials

WUFI → Fraunhofer-IBP → Green and Gravel Roofs

| Material Name                           | Bulk density [kg/m³] | Porosity [m³/m³] | Heat Cap. [J/kgK] | Therm. Cond. [W/mK] | Vap.Res. [-] |
|-----------------------------------------|----------------------|------------------|-------------------|---------------------|--------------|
| generic gravel                          | 1400                 | 0.3              | 1000              | 0.7                 | 1            |
| generic substrate                       | 1500                 | 0.5              | 1500              | 0.9                 | 5            |
| Optigreen Economy Roof 1                |                      |                  |                   |                     |              |
| Optigreen Economy Roof 2                |                      |                  |                   |                     |              |
| Optigreen Light-weight Roof Solution 1  |                      |                  |                   |                     |              |
| <b>Optigreen Nature Roof Solution 1</b> |                      |                  |                   |                     |              |
| Grasses                                 | 1500                 | 0.5              | 1000              | 0.2                 | 5            |
| Substrate type E                        | 912                  | 0.65             | 1000              | 0.4                 | 3.4          |
| Filter mat                              | 83                   | 0.95             | 840               | 0.035               | 1            |
| Drainage board                          | 60                   | 0.95             | 850               | 0.3                 | 1.3          |
| Protection mat                          | 83                   | 0.95             | 840               | 0.035               | 1            |
| Optigreen Pitched Roof 5° - 45°         |                      |                  |                   |                     |              |

Hygrothermal Functions | System information

Optigreen-System Nature Roof Solution 1

NOTE: Usage of green roof models, boundary conditions and necessary moisture sources are given in the "guideline for the calculation of extensive green roofs" ([www.wufi.de/en/service/downloads/](http://www.wufi.de/en/service/downloads/)). Some additional information is given in the info-text of each material.

Assembly from outside to inside (to the roofing membrane):

- 1 cm grasses: Seeding with sedum shoots and seed mix of grasses and herbs
- 10 cm substrate type E: Extensive Substrate Type E
- 0.1 cm filter mat: Filter Fleece Type 105
- 4 cm drainage board: Drainage board Type FKD 40

Added to DB: Jul 24, 2013  
Last update: ---

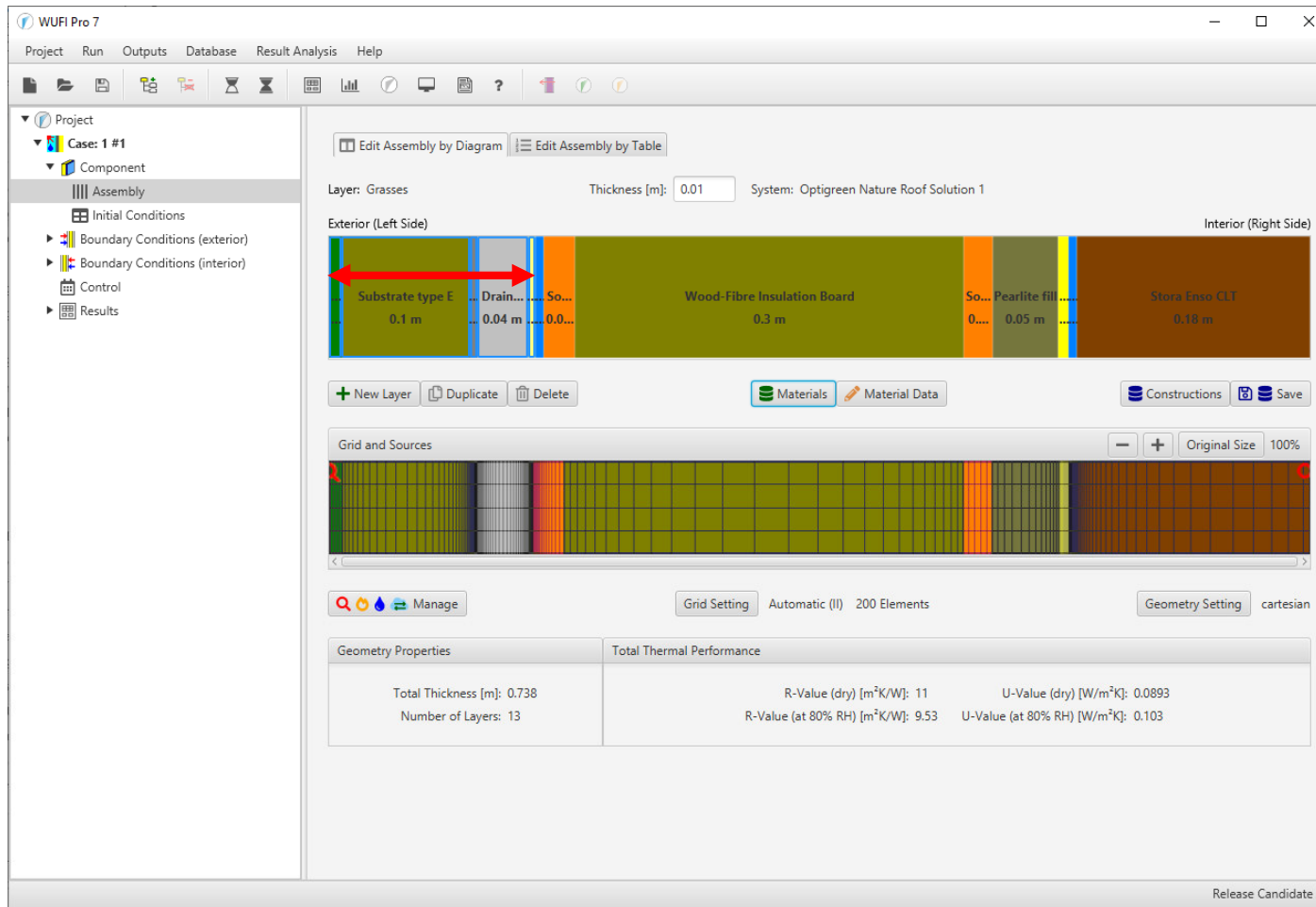
Thickness [m]: 0.152

Assign Cancel Help

Release Candidate 2

# New User Surface

## Systems



### Systems:

- are treated as one material
- can be moved as a complete unit

### but:

- thicknesses can be changed separately
- properties can be adapted separately
- can be mirrored
- can be resolved if required

# Material Database

## New Catalogues

FabTrads, UCD Ireland  
26 new materials

Australia & New Zealand  
65 materials

WUFI materials

Search materials

All Sources

WUFI

Fraunhofer-IBP

Concrete and Screeds

Green and Gravel Roofs

Insulating Materials

Masonry Bricks

Membranes

Mortar and Plaster

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Generic Materials

Australia & New Zealand Database

Insulation Materials

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Japan Database

Korean Database

LTH Lund University, Sweden

MASEA Database, Germany

Materials for thermal calculations

North America Database

NTNU Norwegian University of Science and Technology

Obsolete Materials

University of Technology Vienna, Austria

User defined

| Material Name                                  |                                                                                     | Bulk density<br>[kg/m³] | Porosity<br>[m³/m³] | Heat Cap.<br>[J/kgK] | Therm. Cond.<br>[W/mK] | Vap.Res.<br>[-] |
|------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------|---------------------|----------------------|------------------------|-----------------|
| CL7/290 (untreated)                            |  |                         |                     |                      |                        |                 |
| CL7/310 (treated)                              |                                                                                     |                         |                     |                      |                        |                 |
| CL7/310 (untreated)                            |                                                                                     |                         |                     |                      |                        |                 |
| FOAMGLAS Perinsul HL                           |                                                                                     | 200                     | 0.25                | 1000                 | 0.058                  | 1500000         |
| Glasswool Ceiling Insulation Low Density       |                                                                                     | 8.8                     | 0.999               | 840                  | 0.043                  | 1.21            |
| Membrane 01 Class 1 AS_NZS 4200.1 (7500MN.s/g) |                                                                                     | 130                     | 0.001               | 2300                 | 2.3                    | 1500000         |
| Membrane 02 Class 2 AS_NZS 4200.1 (500MN.s/g)  | 130                                                                                 | 0.001                   | 2300                | 2.3                  | 100000                 |                 |
| Membrane 03 Class 2 AS_NZS 4200.1 (250MN.s/g)  | 130                                                                                 | 0.001                   | 2300                | 2.3                  | 50000                  |                 |

Hygrothermal Functions

Material Information

Moisture Storage Function

Liquid Transport Coefficient, Suction

Liquid Transport Coefficient, Redistribution

Water Vapour Diffusion Resistance Factor, moisture-depe...

Thermal Conductivity, moisture-dependent

Thermal Conductivity, temperature-dependent

Enthalpy, temperature-dependent

☐ Approximate

| No.                 | RH<br>[-] | Water Cont...<br>[kg/m³] |
|---------------------|-----------|--------------------------|
| No content in table |           |                          |

Water Content [kg/m³]

Relative Humidity [-]

Import

Export

Thickness [m]:

Close

Help

# Constructions Database

WUFI constructions

Search constructions

WUFI → Fraunhofer-IBP → Roofs

Construction Name

- Flat Roof #1
- Flat Roof #2
- Flat roof #3
- Flat roof #4
- Flat roof #5
- Flat roof #6**
- Inclined Roof #1
- Inclined Roof #2
- Inclined Roof #3

Component Assembly Info Text

| No. | Layer/Material from Outside to Inside | Thickness [m] |
|-----|---------------------------------------|---------------|
| 1   | Roof Membrane V13                     | 0.001         |
| 2   | Roof Membrane V13                     | 0.001         |
| 3   | Softwood (formwork, thin l...         | 0.024         |
| 4   | Wood-Fibre Insulation Board           | 0.3           |
| 5   | Softwood (formwork, thin l...         | 0.022         |
| 6   | Pearlite fill                         | 0.05          |
| 7   | Cork (heat cond.: 0,04 W/...          | 0.008         |
| 8   | Roof Membrane V13                     | 0.001         |
| 9   | Softwood (formwork, thin l...         | 0.18          |

Close Help

# New User Surface

## Initial Conditions

WUFI Pro 7

Project Run Outputs Database Result Analysis Help

Project

- Case: 1 #1
  - Component
    - Assembly
      - Initial Conditions**
      - Boundary Conditions (exterior)
      - Boundary Conditions (interior)
      - Control
      - Results

**Initial Temperature** ?

☒ Constant across Component Initial Temperature in Component [°C] 20

☐ Manual settings

**Initial Moisture** ?

☒ Same relative humidity in all layers (e.g. lightweight constructions and fabric) Initial Relative Humidity [ - ] 0.8

☐ Assign typical built-in moisture (e.g. solid constructions and new buildings)

☐ Manual settings

Initial Conditions in Different Layers

| No. | Material Layer                   | Thickness [m] | Temperature [°C] | Rel. Humidity [ - ] | Water Content [kg/m³] | Typical Built-In ... [kg/m³] |
|-----|----------------------------------|---------------|------------------|---------------------|-----------------------|------------------------------|
| 1   | Roof Membrane V13                | 0.001         | 20               | 0.8                 | 0.001881              | 0.001881                     |
| 2   | Softwood (formwork, thin layers) | 0.024         | 20               | 0.8                 | 60                    | 60                           |
| 3   | Wood-Fibre Insulation Board      | 0.3           | 20               | 0.8                 | 19                    | 19                           |
| 4   | Softwood (formwork, thin layers) | 0.022         | 20               | 0.8                 | 60                    | 60                           |
| 5   | Pearlite fill                    | 0.05          | 20               | 0.8                 | 28                    | 28                           |
| 6   | Cork (heat cond.: 0,04 W/mK)     | 0.008         | 20               | 0.8                 | 1.693                 | 1.693                        |
| 7   | Roof Membrane V13                | 0.001         | 20               | 0.8                 | 0.001881              | 0.001881                     |
| 8   | Stora Enso CLT                   | 0.18          | 20               | 0.8                 | 63                    | 48                           |

Release Candidate 2

component  
assembly

# New User Surface

## Initial Conditions

WUFI Pro 7

Project Run Outputs Database Result Analysis Help

Project

- Case: 1 #1
  - Component
    - Assembly
      - Initial Conditions
      - Boundary Conditions (exterior)
      - Boundary Conditions (interior)
      - Control
      - Results

Initial Temperature

Constant across Component Initial Temperature in Component [°C] 20

Manual settings

Initial Moisture

Same relative humidity in all layers (e.g. lightweight constructions and fabric)

Assign typical built-in moisture (e.g. solid constructions and new buildings)

Manual settings

In each Layer

Read from File

Initial Conditions in Different Layers

| No. | Material Layer                   | Thickness [m] | Temperature [°C] | Rel. Humidity [-] | Water Content [kg/m³] | Typical Built-In ... [kg/m³] |
|-----|----------------------------------|---------------|------------------|-------------------|-----------------------|------------------------------|
| 1   | Roof Membrane V13                | 0.001         | 20               | 0.8               | 0.001881              | 0.001881                     |
| 2   | Softwood (formwork, thin layers) | 0.024         | 20               | 0.8714            | 80.0                  | 60                           |
| 3   | Wood-Fibre Insulation Board      | 0.3           | 20               | 0.8               | 19                    | 19                           |
| 4   | Softwood (formwork, thin layers) | 0.022         | 20               | 0.8               | 60                    | 60                           |
| 5   | Pearlite fill                    | 0.05          | 20               |                   |                       |                              |
| 6   | Cork (heat cond.: 0,04 W/mK)     | 0.008         | 20               |                   |                       |                              |
| 7   | Roof Membrane V13                | 0.001         | 20               |                   |                       |                              |
| 8   | Stora Enso CLT                   | 0.18          | 20               |                   |                       |                              |

Softwood (formwork, thin layers): Water Content

Mass-% 20

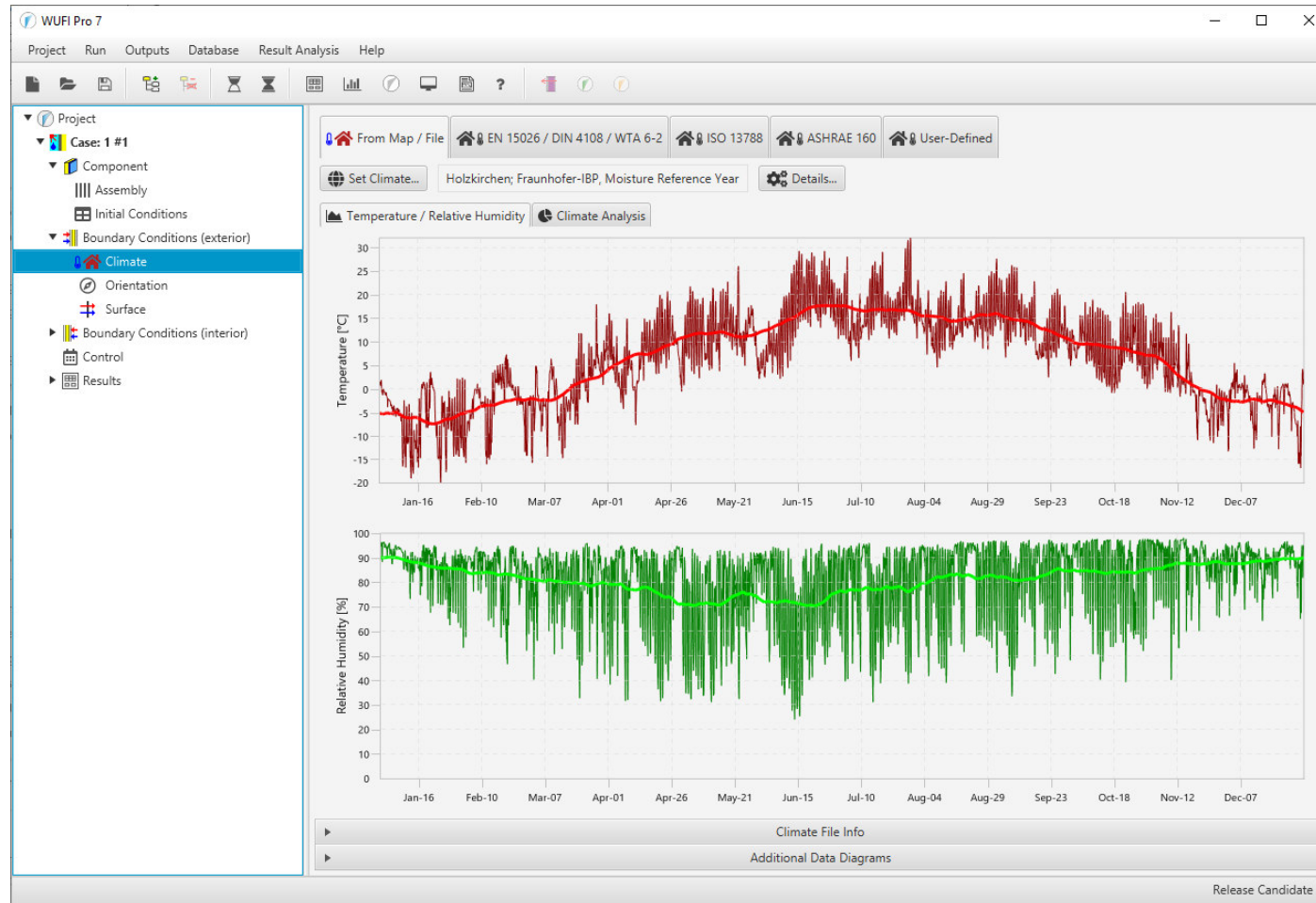
Volume-% 8

kg/m³ 80.0

Release Candidate 2

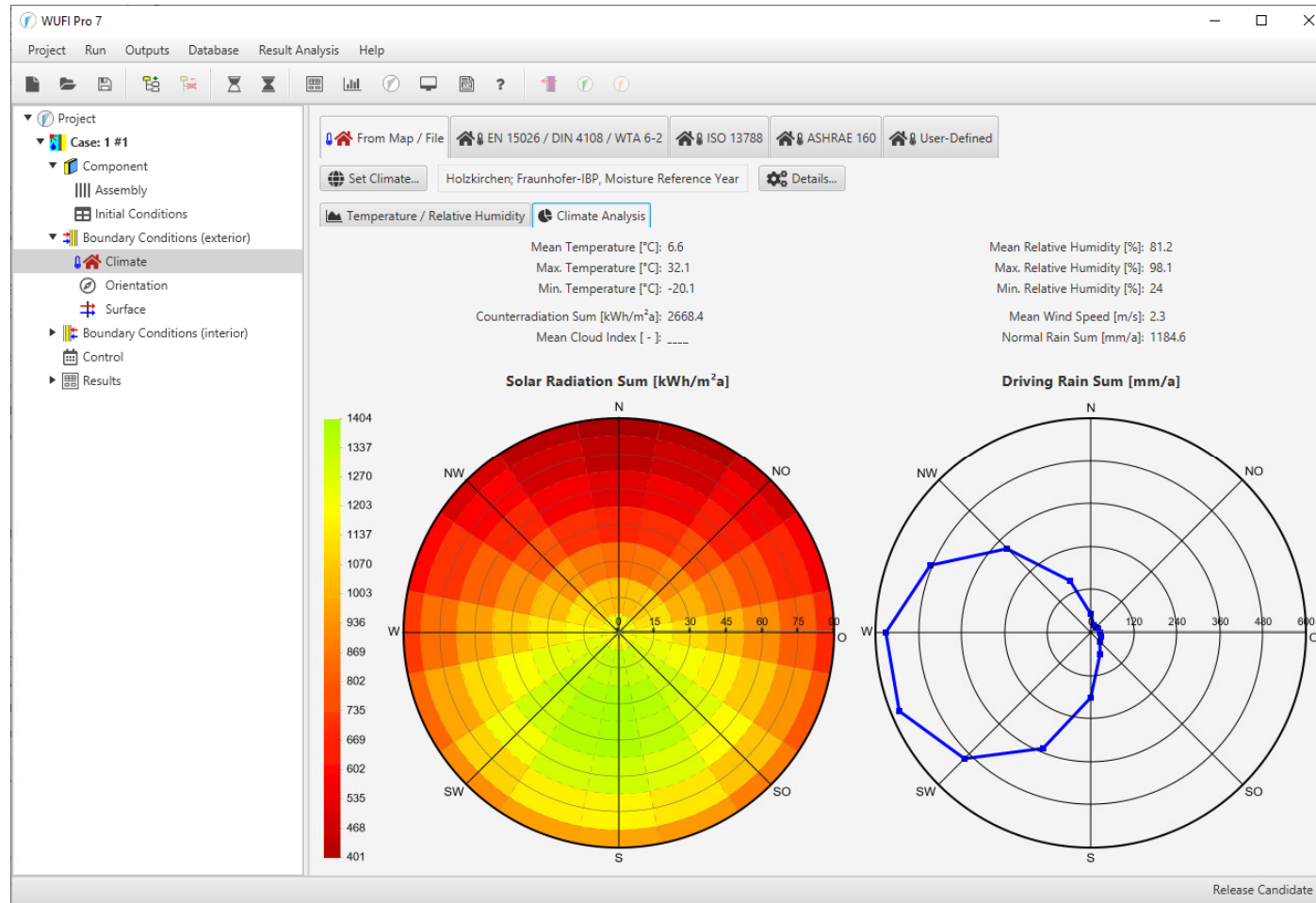
# New User Surface

## Climate



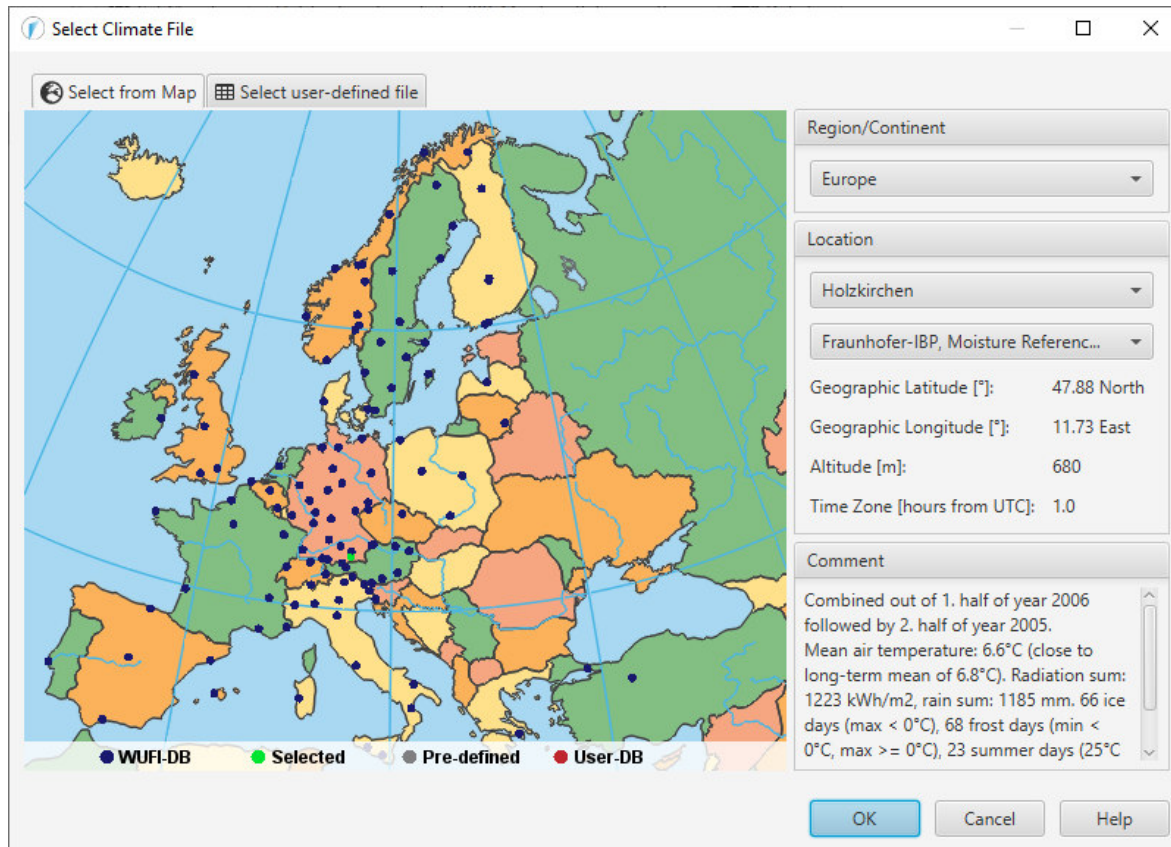
# New User Surface

## Climate



# Climate Database

## New climate locations

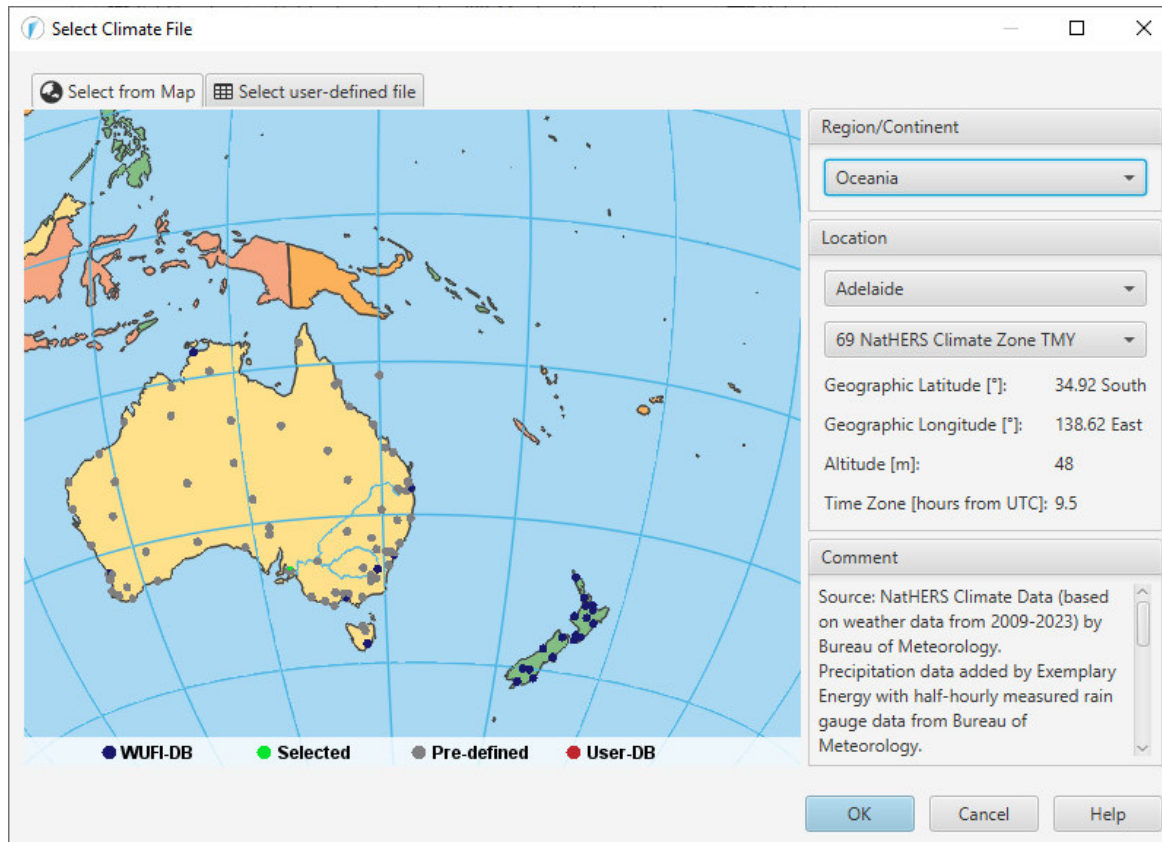


### 23 new locations in Europe:

- Klagenfurt, Zwettl (AT)
- La Chaux De Fond (CH)
- Holzkirchen HRY (DE)
- Copenhagen, Ringkoebing (DK)
- Suolahti (FI)
- Feuquières-en-Vimeu, Nizza (FR)
- Athen (GR)
- Dublin (IE)
- Rome, Verona (IT)
- Vilnius (LT)
- Riga (LV)
- Amsterdam (NL)
- Gniezno (PL)
- Ankara, Istanbul (TR)
- Glasgow, London, Manchester, Southampton (UK)

# Climate Database

## New climate locations



### 8 new locations in Australia

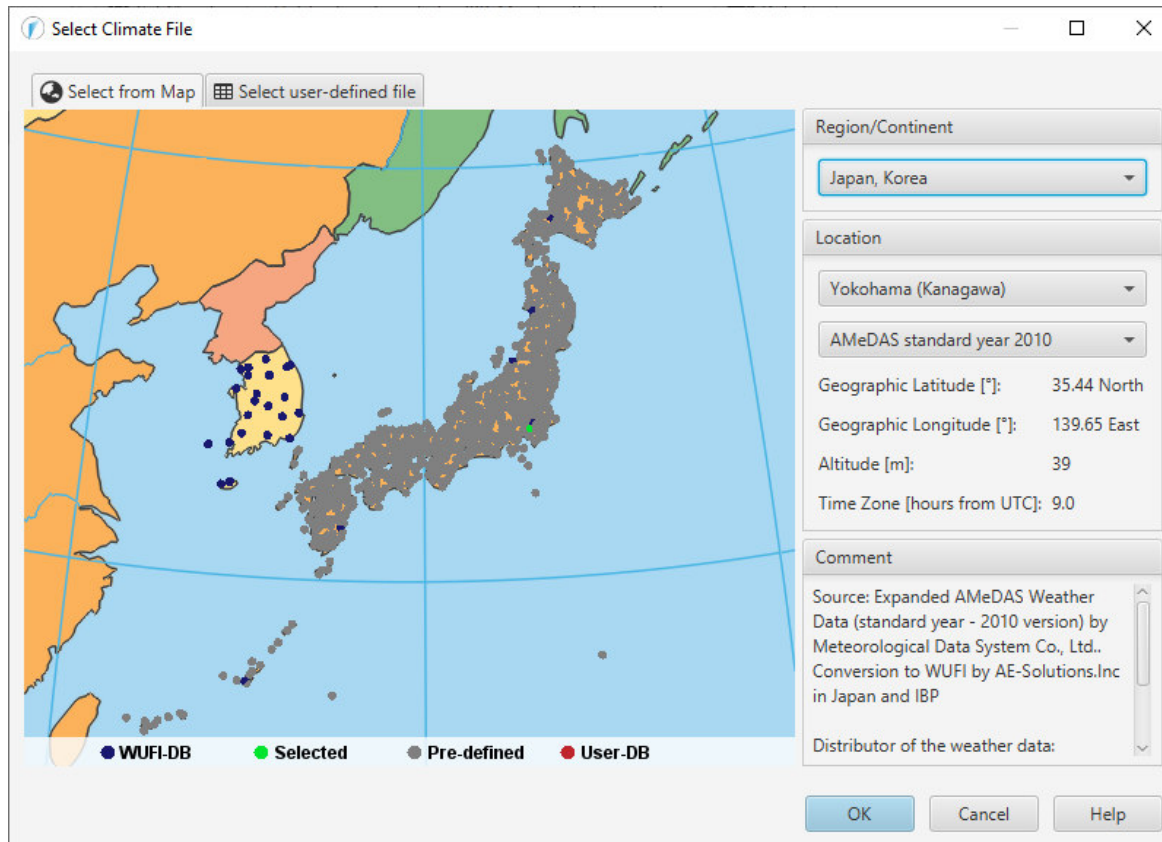
- Adelaide, Brisbane, Canberra, Darwin, Hobart, Moorabbin, Perth
- + 83 available for purchase from Exemplary Energy

### 18 new climate files for New Zealand

- Auckland, Tauranga, Christchurch, Dunedin  
Napier, Hamilton, Invercargill, Paraparaumu  
Kaitia, Nelson, New Plymouth  
Lauder, Queenstown, Rotorua  
Turangi, Hokitika, Masterton, Wellington

# Climate Database

## New climate locations

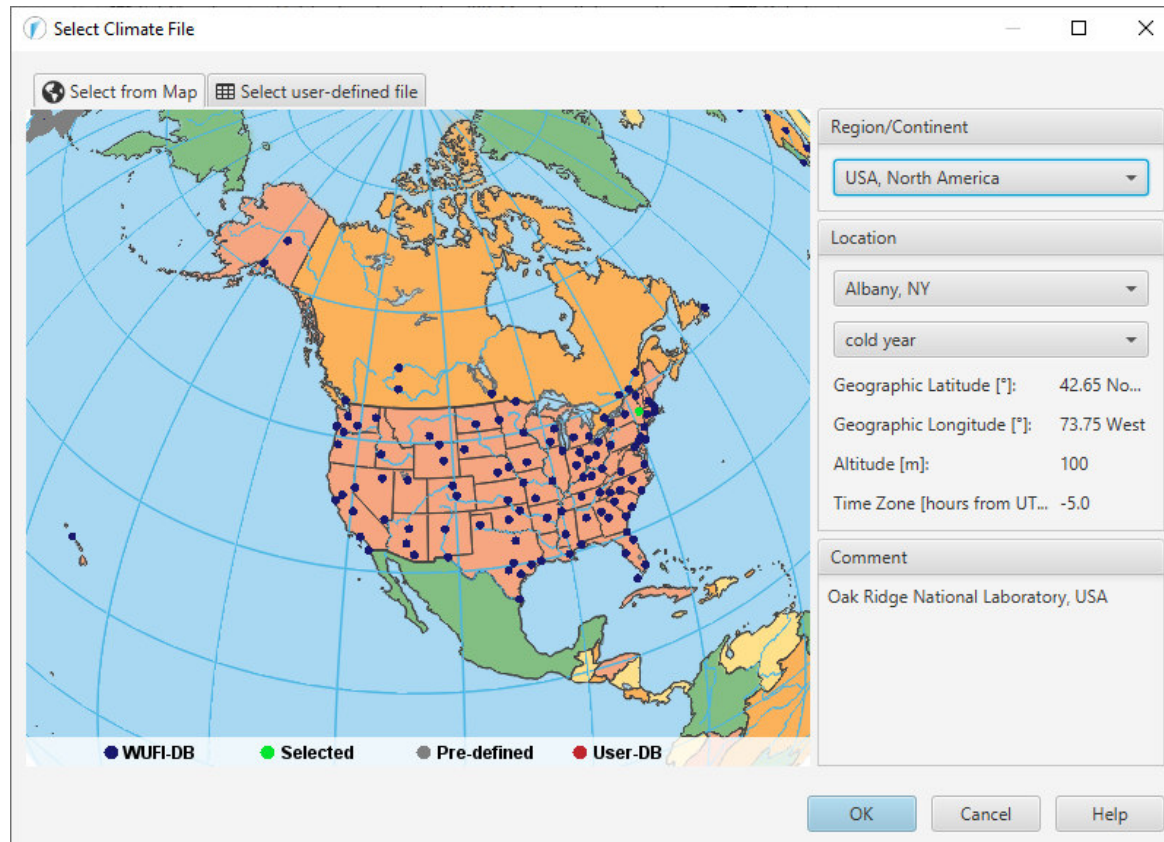


### 7 new climate files for Japan

- Sapporo, Akita, Niigata, Tokyo, Yokohama, Miyazaki, Naha
- + ca. 800 available for purchase from EI.Ltd

# Climate Database

## New climate locations

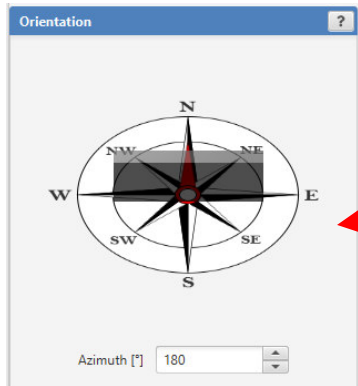


### 1 new location in USA:

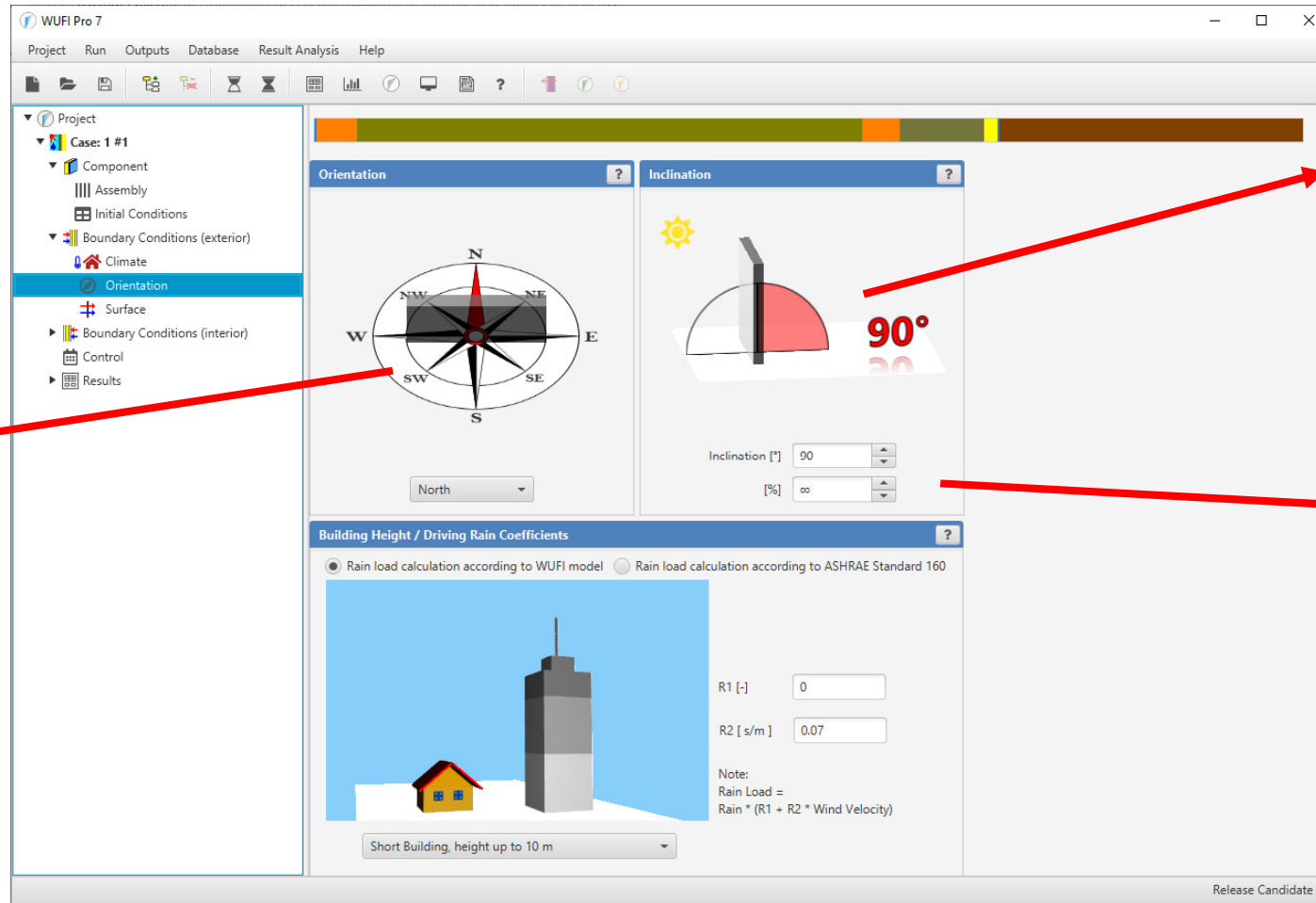
- Greenwood, SC

# New User Surface

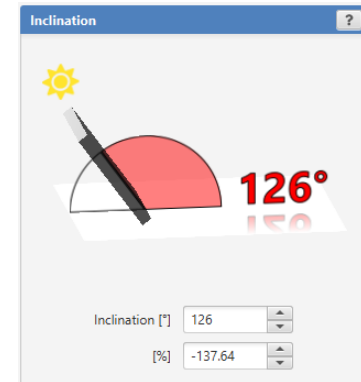
## Orientation



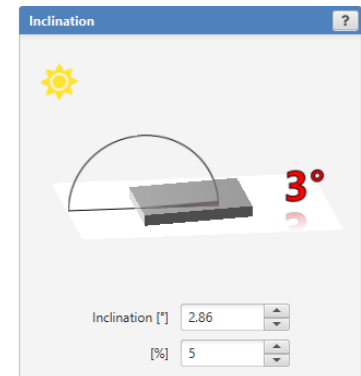
Orientation can be changed to Azimuth [°]



Inclination  
now up to 180°  
(overhang / passage)



Inclination in %  
(for flat roofs)



# New User Surface

Boundary conditions exterior/interior separated

WUFI Pro 7

Project Run Outputs Database Result Analysis Help

Project

- Case: 1 #1
  - Component
    - Assembly
      - Initial Conditions
      - Boundary Conditions (exterior)
      - Climate
      - Orientation
      - Surface
    - Boundary Conditions (interior)
    - Control
    - Results

**Heat Transfer**

Heat Transfer Coefficient [W/m²K] 19 Roof

long-wave radiation parts Heat Transfer Coefficient [W/m²K] 6.5

wind-dependent ☐

Wind-dependence formula

**Vapour Transfer**

Additional diffusion resistance (e.g. coating), sd-Value [m] ---- No coating

Note: This setting does not affect rain absorption.

**Radiation**

Short-wave absorptivity, e.g. solar radiation [-] 0.6 Green roof, Optigreen system

Radiative overcooling ☒ Note: Explicit Radiation Balance. Includes radiative cooling due to long-wave emission.

Long-wave emissivity, e.g. nighttime radiative cooling [-] 0.9

Additional radiation parameters

Reduction factors

for absorptivity [-] ---- No reduction

for emissivity [-] ----

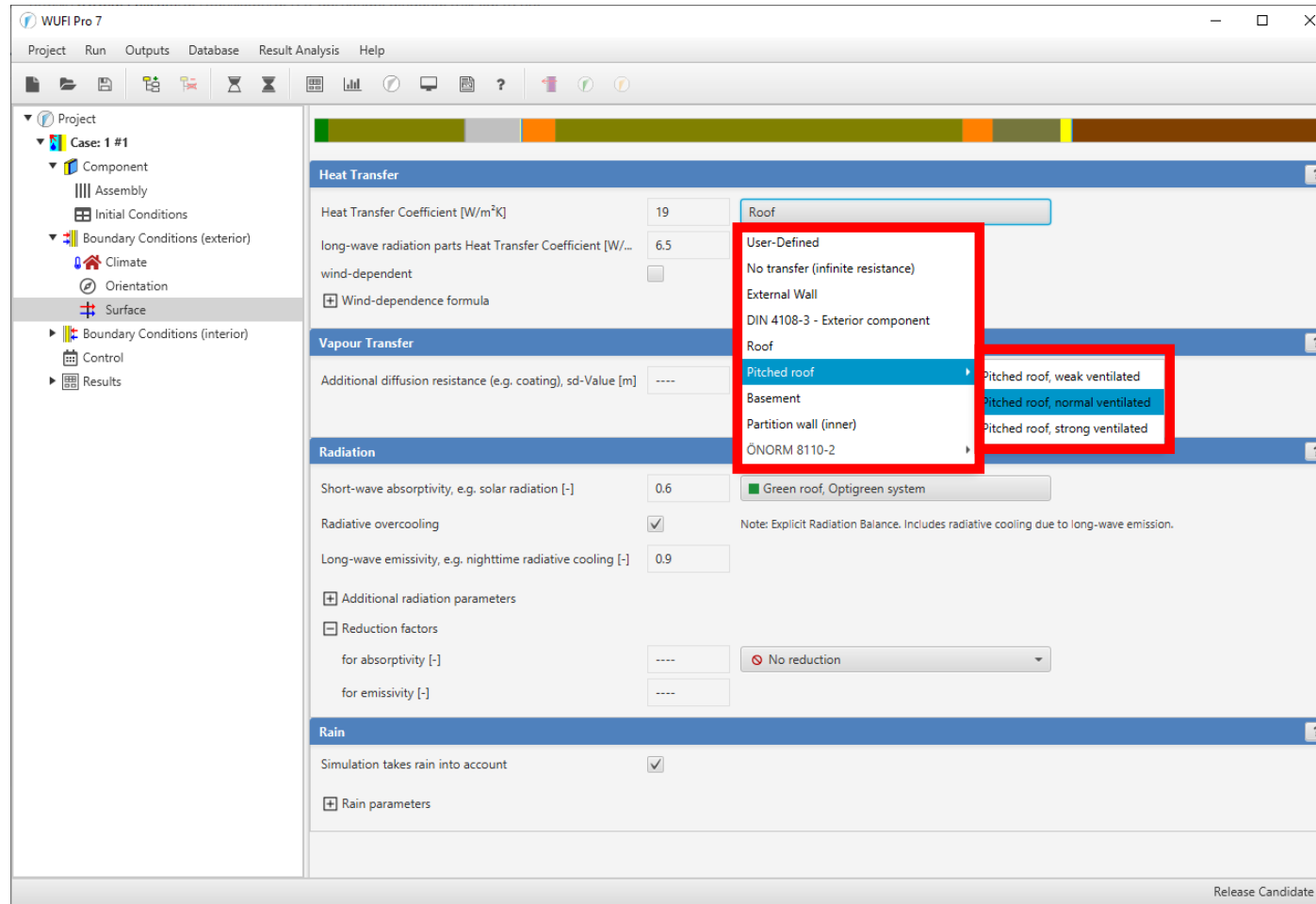
**Rain**

Simulation takes rain into account ☒

Rain parameters

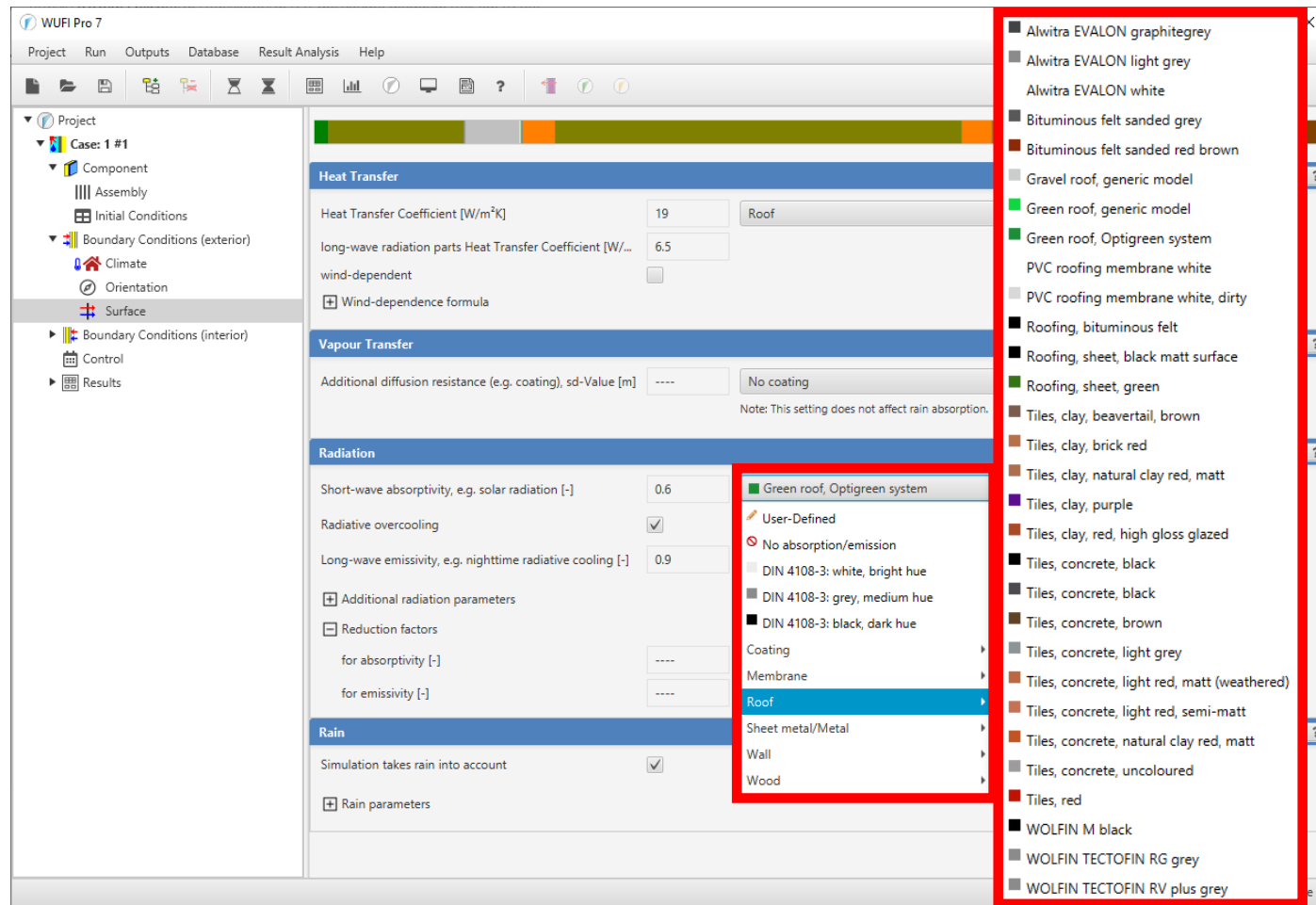
Release Candidate 2

# New User Surface



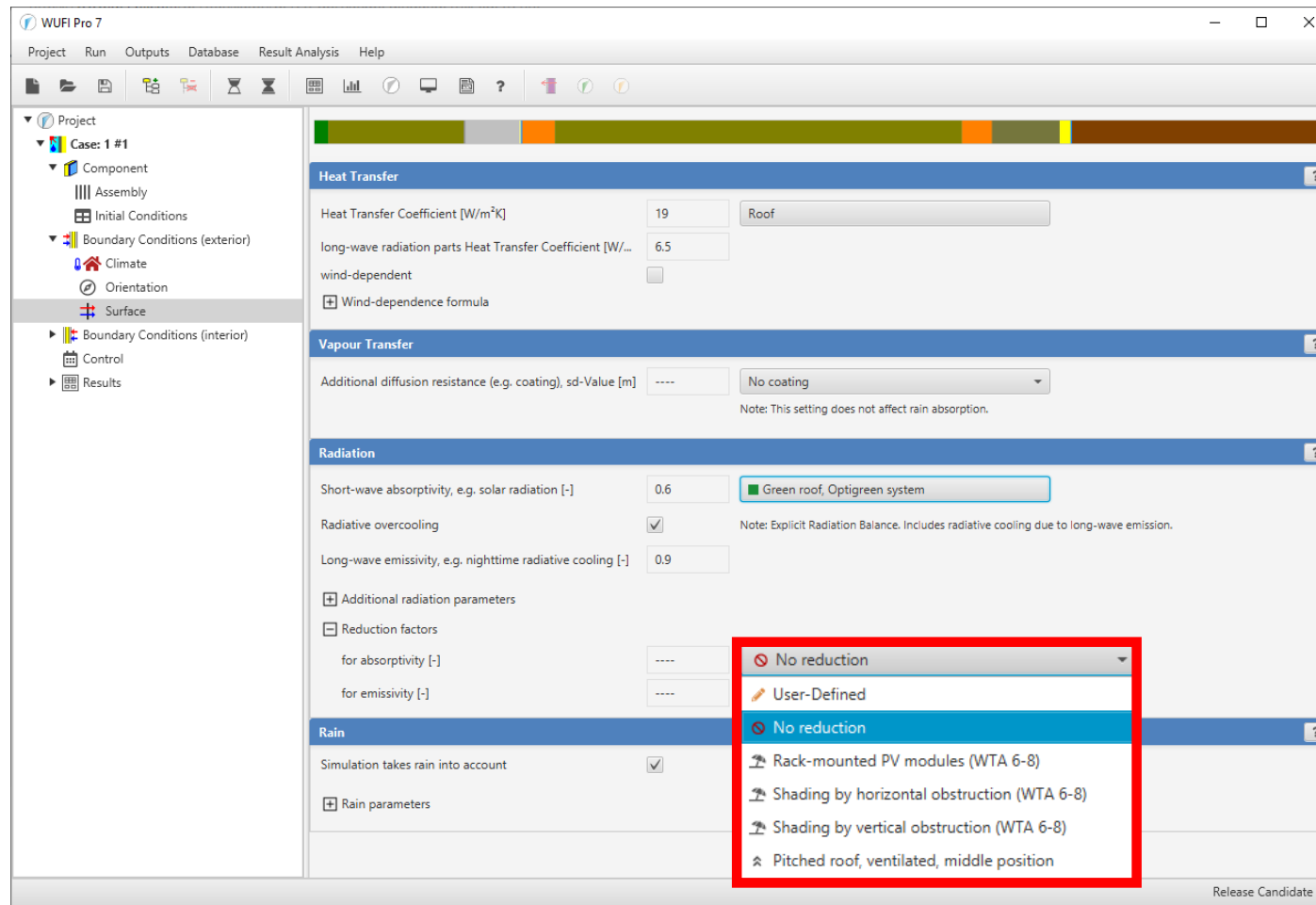
# New User Surface

## Surface



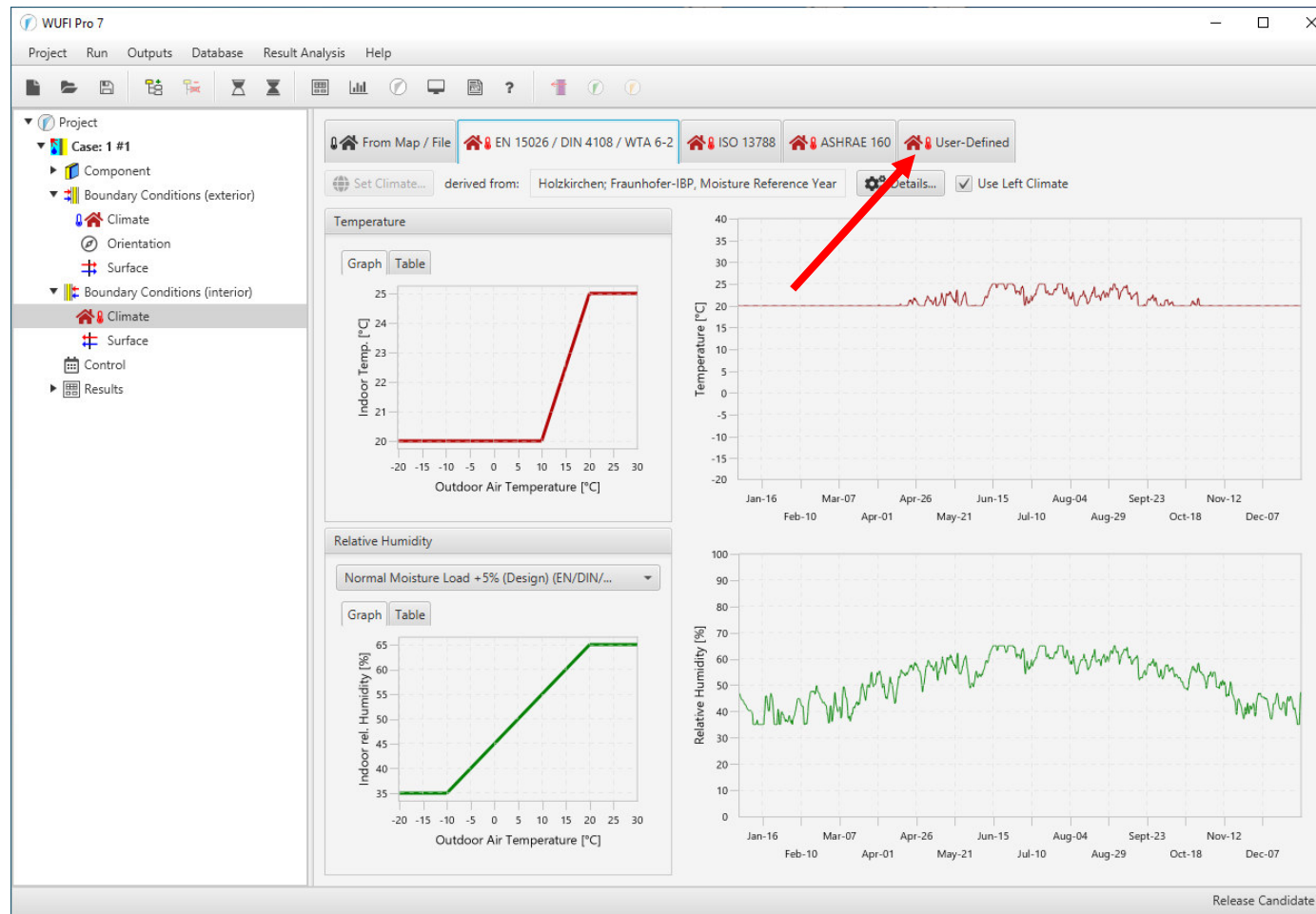
# New User Surface

## Surface



# New User Surface

## Indoor Climate

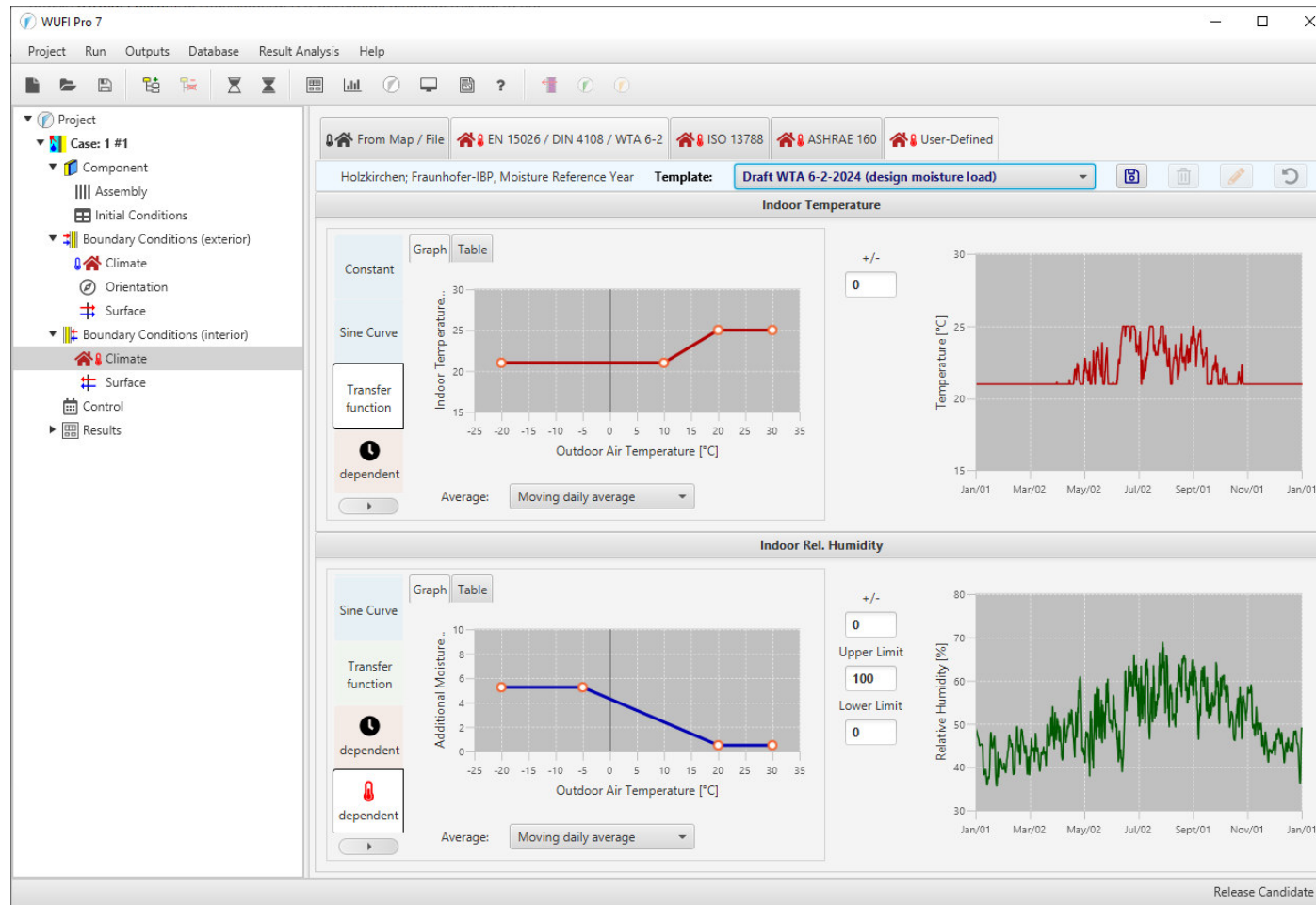


### User-Defined:

- Own setting of the derivation possible
- Can be saved as a template

# New User Surface

## Indoor Climate

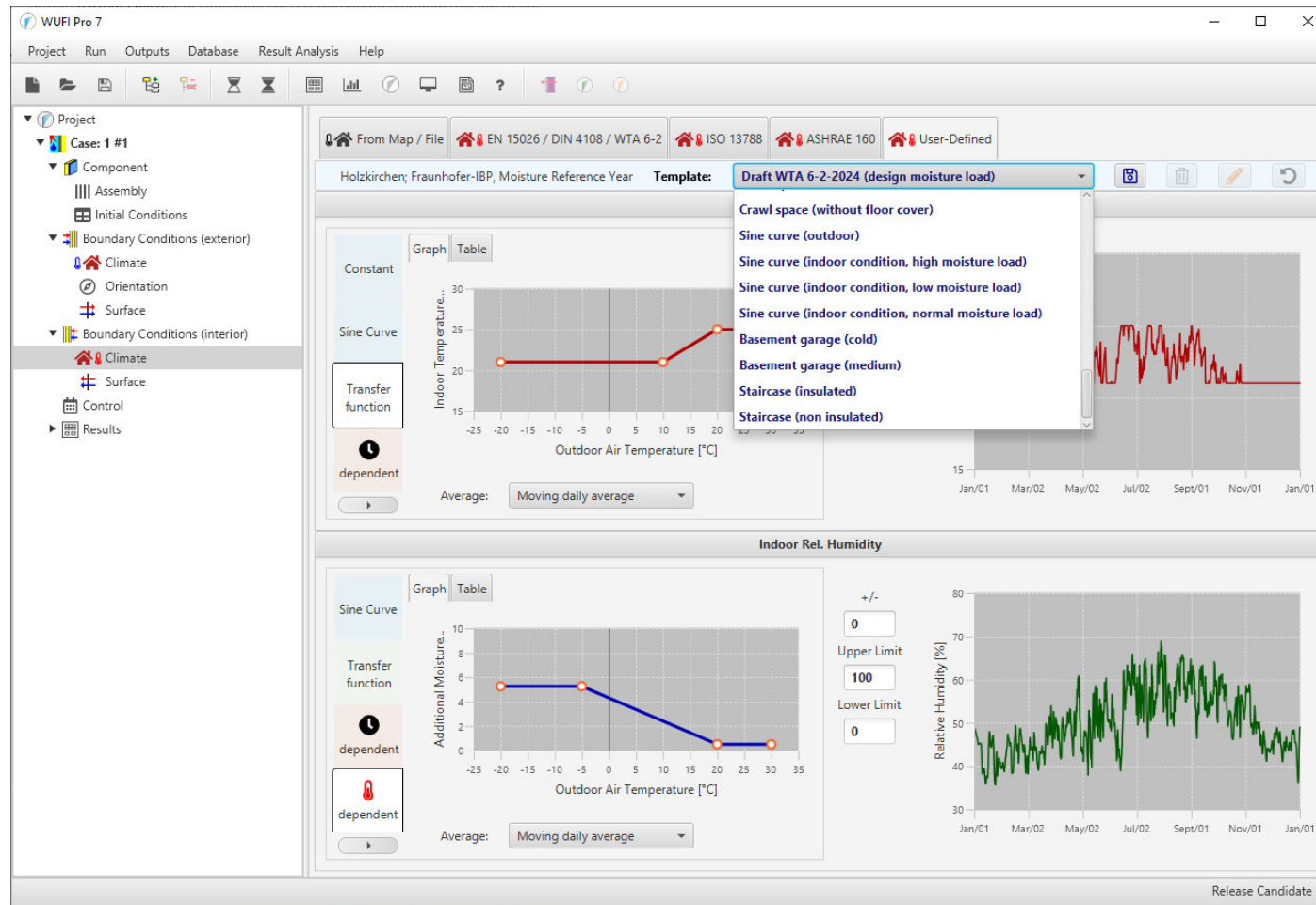


### User-Defined:

- Own setting of the derivation possible
- Can be saved as a template

# New User Surface

## Indoor Climate



### User-Defined:

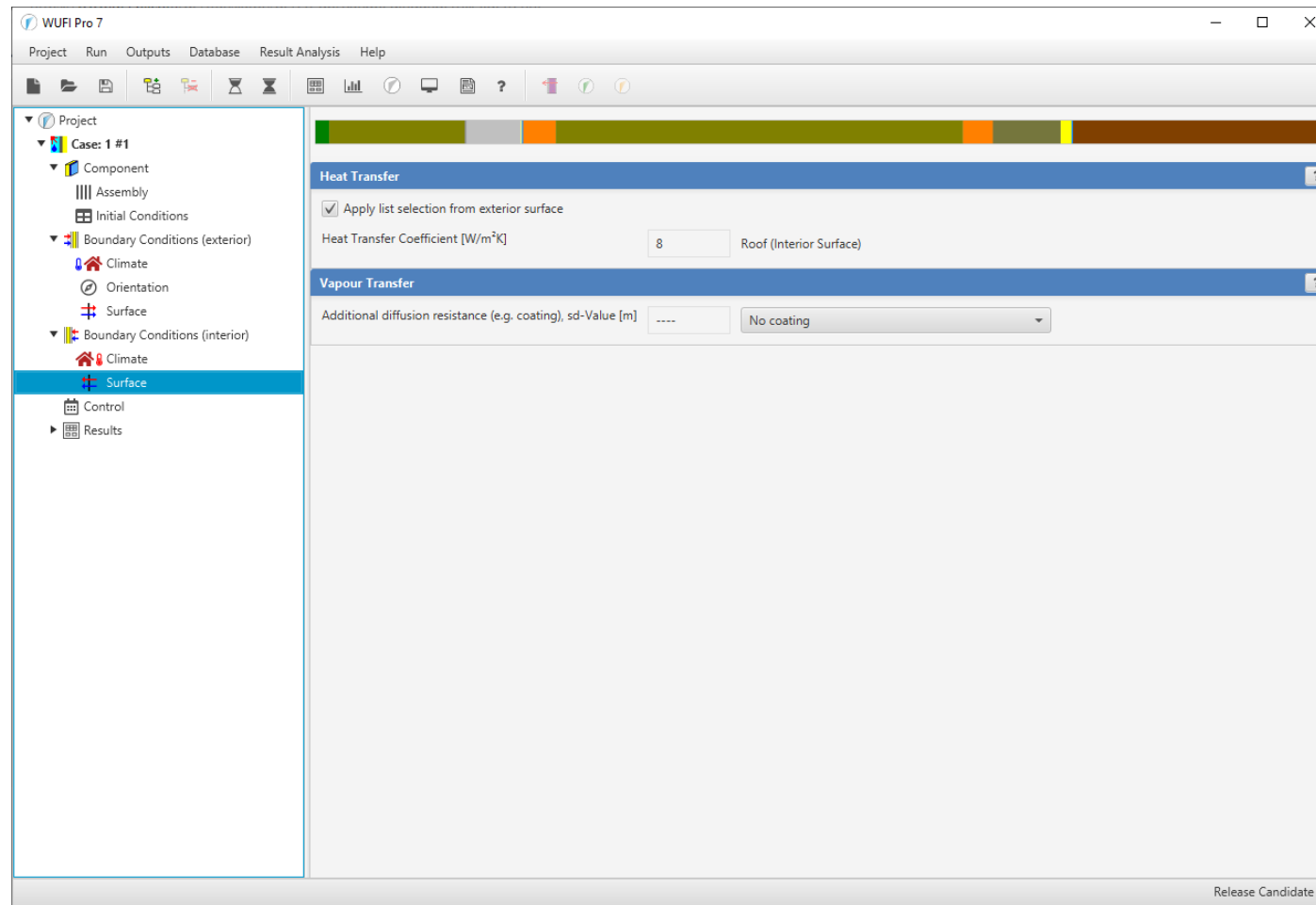
- Own setting of the derivation possible
- Can be saved as a template

### Included:

- Unheated attic
- Basement garage
- Basement side room
- Crawl space
- Staircase
- Draft WTA 6-2:2024
- French indoor climate
- ...

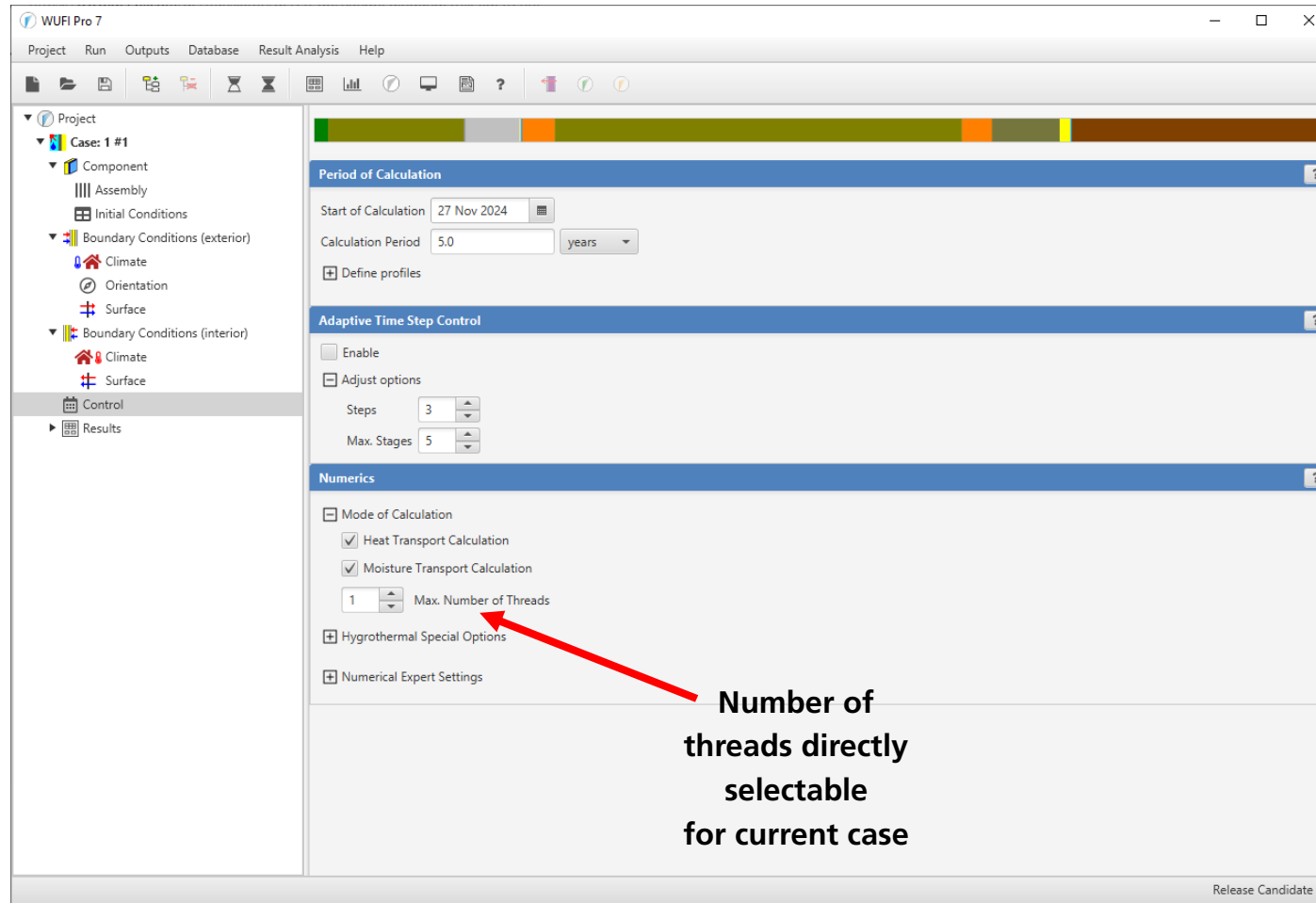
# New User Surface

## Interior Surface



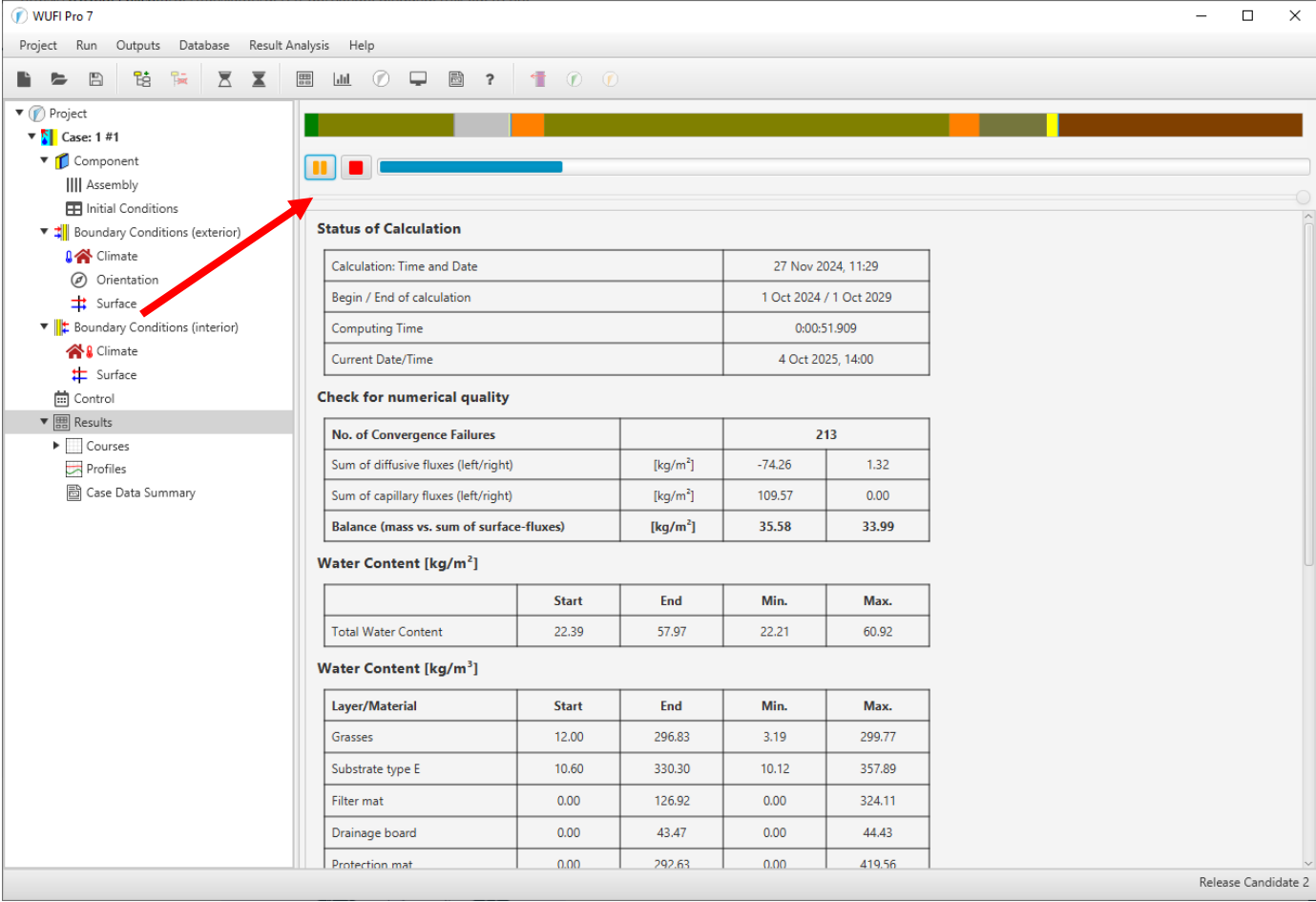
# New User Surface

## Control



# New User Surface

## Calculation



The screenshot shows the WUFI Pro 7 software interface. The left sidebar contains a tree view of the project structure. A red arrow points to the 'Surface' icon under 'Boundary Conditions (interior)'. The main window displays the 'Status of Calculation' and 'Check for numerical quality' sections.

**Status of Calculation**

|                            |                         |
|----------------------------|-------------------------|
| Calculation: Time and Date | 27 Nov 2024, 11:29      |
| Begin / End of calculation | 1 Oct 2024 / 1 Oct 2029 |
| Computing Time             | 0:00:51.909             |
| Current Date/Time          | 4 Oct 2025, 14:00       |

**Check for numerical quality**

| No. of Convergence Failures              |                      | 213    |       |
|------------------------------------------|----------------------|--------|-------|
| Sum of diffusive fluxes (left/right)     | [kg/m <sup>2</sup> ] | -74.26 | 1.32  |
| Sum of capillary fluxes (left/right)     | [kg/m <sup>2</sup> ] | 109.57 | 0.00  |
| Balance (mass vs. sum of surface-fluxes) | [kg/m <sup>2</sup> ] | 35.58  | 33.99 |

**Water Content [kg/m<sup>2</sup>]**

|                     | Start | End   | Min.  | Max.  |
|---------------------|-------|-------|-------|-------|
| Total Water Content | 22.39 | 57.97 | 22.21 | 60.92 |

**Water Content [kg/m<sup>3</sup>]**

| Layer/Material   | Start | End    | Min.  | Max.   |
|------------------|-------|--------|-------|--------|
| Grasses          | 12.00 | 296.83 | 3.19  | 299.77 |
| Substrate type E | 10.60 | 330.30 | 10.12 | 357.89 |
| Filter mat       | 0.00  | 126.92 | 0.00  | 324.11 |
| Drainage board   | 0.00  | 43.47  | 0.00  | 44.43  |
| Protection mat   | 0.00  | 292.63 | 0.00  | 419.56 |

Release Candidate 2

### Calculation:

- Table is updated during calculation

# New User Surface

## Calculation

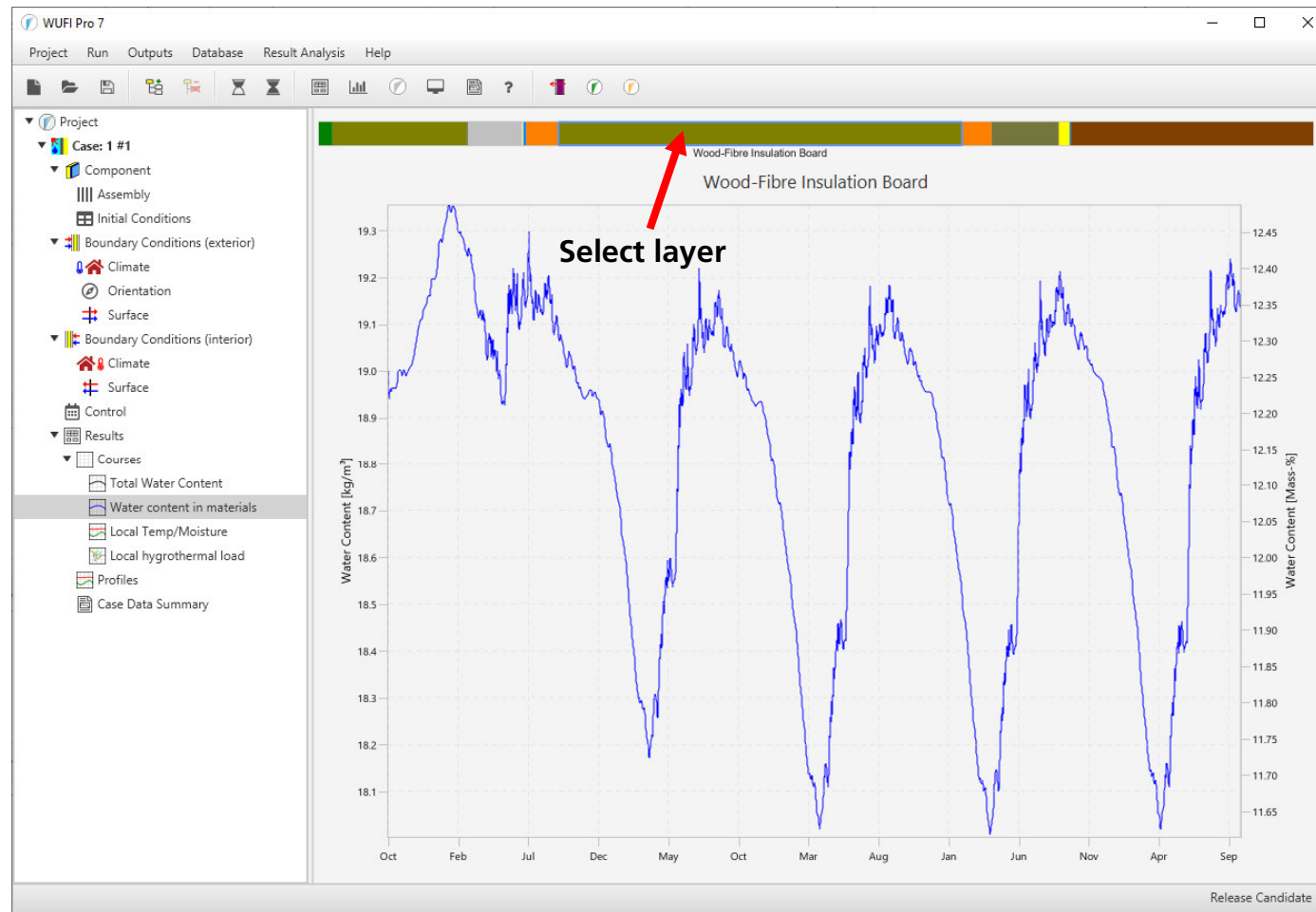


### Calculation:

- Profiles run during the calculation (replaces "Calculate with film")

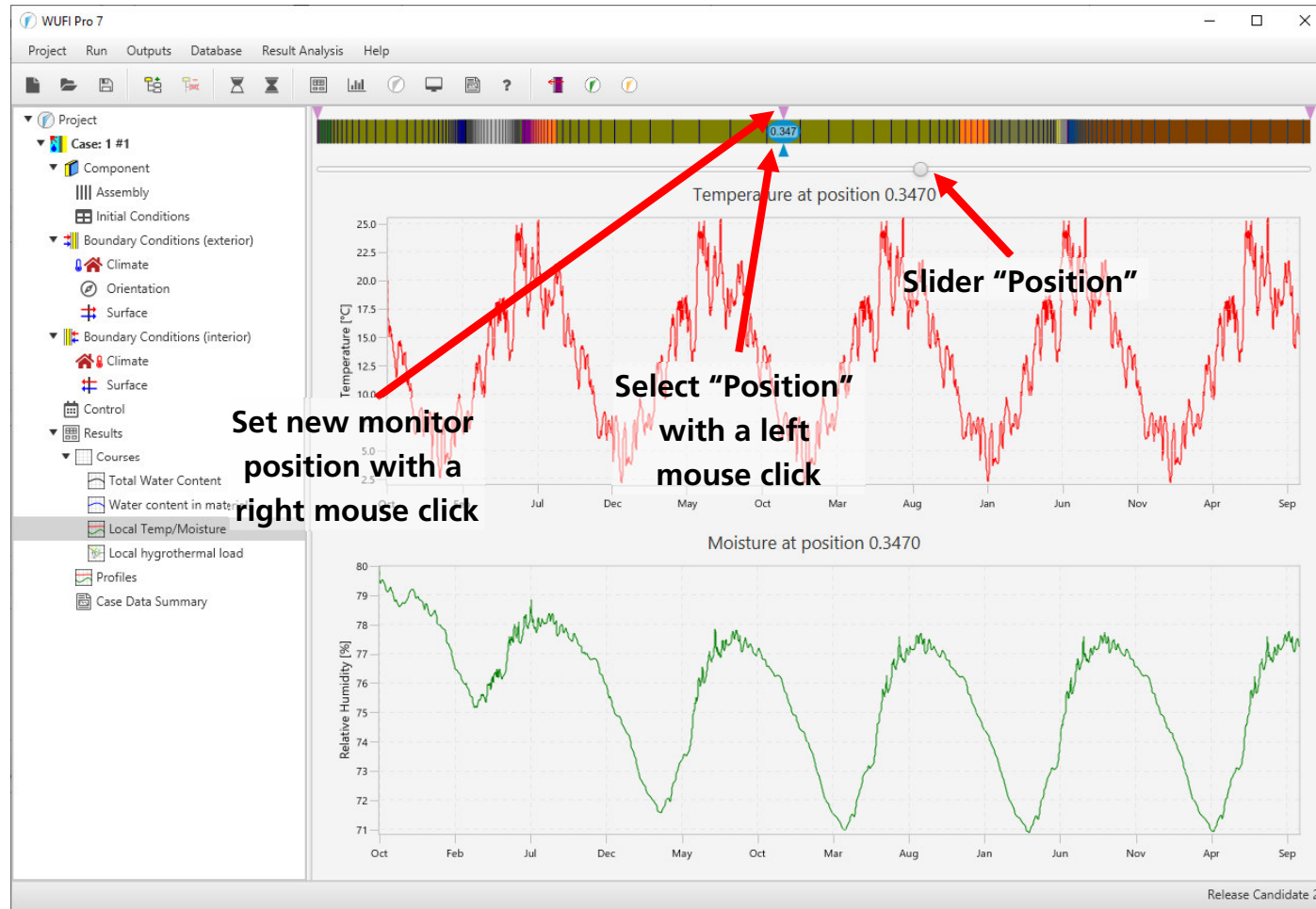
# New User Surface

## Results



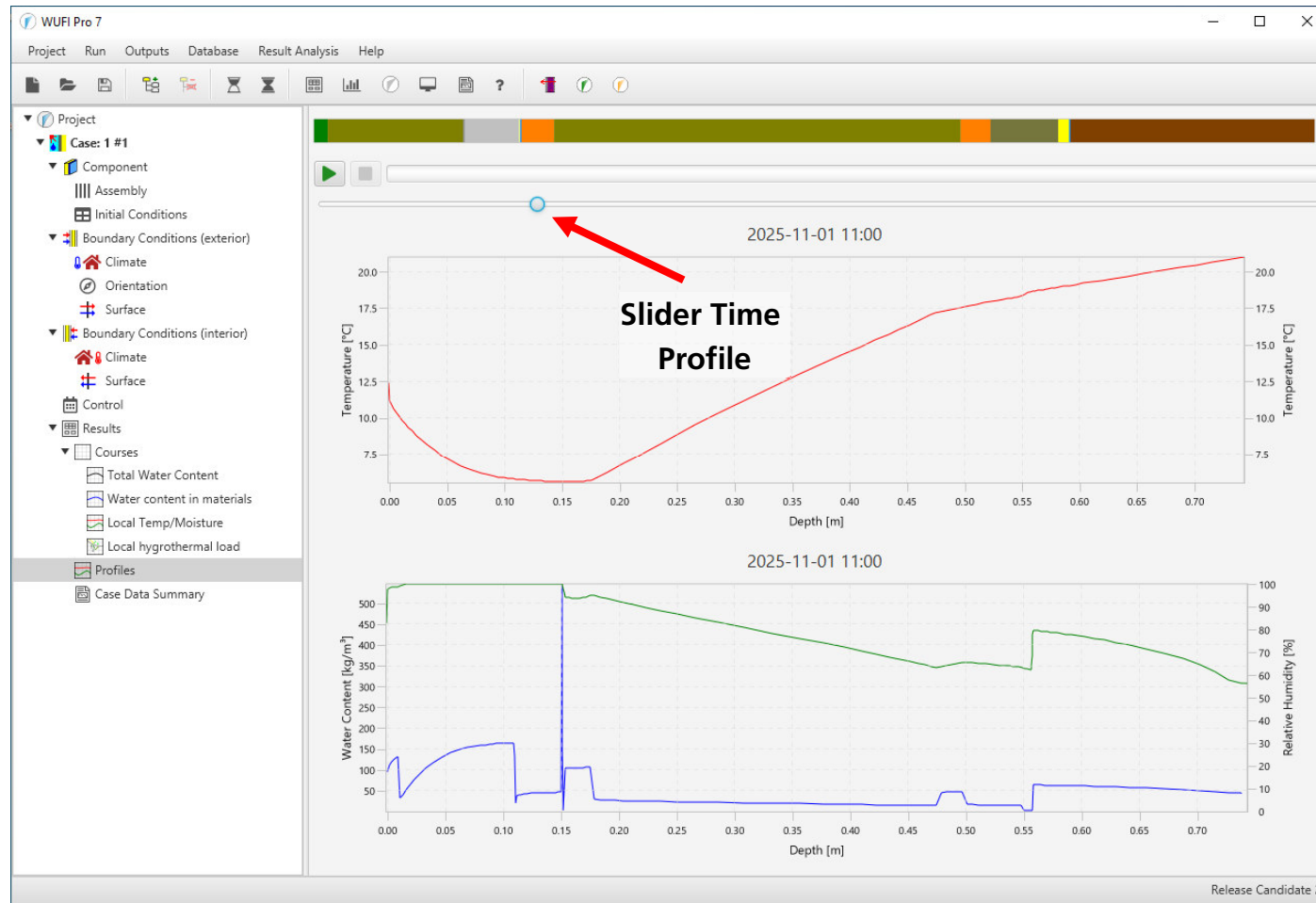
# New User Surface

## Results



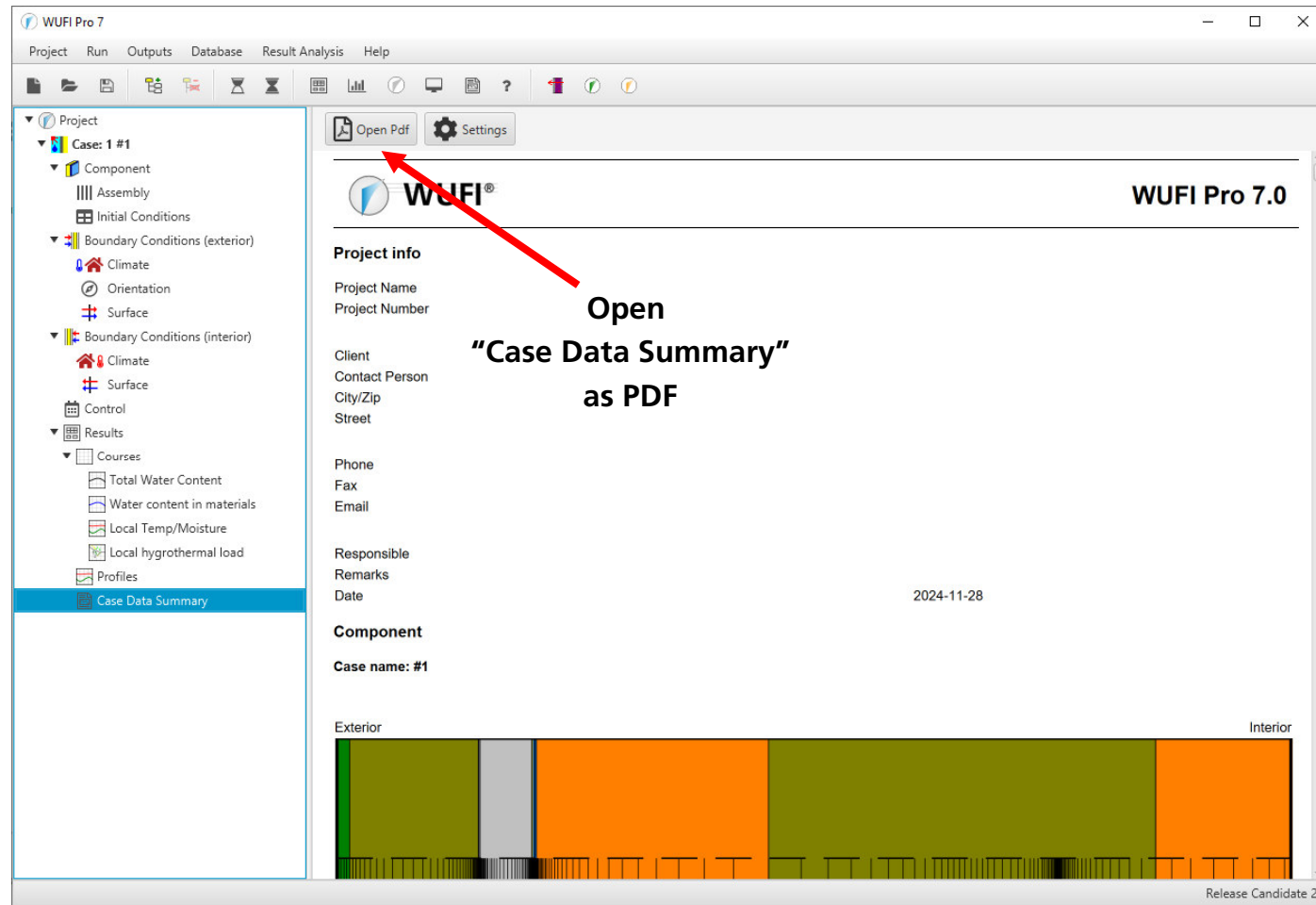
# New User Surface

## Results



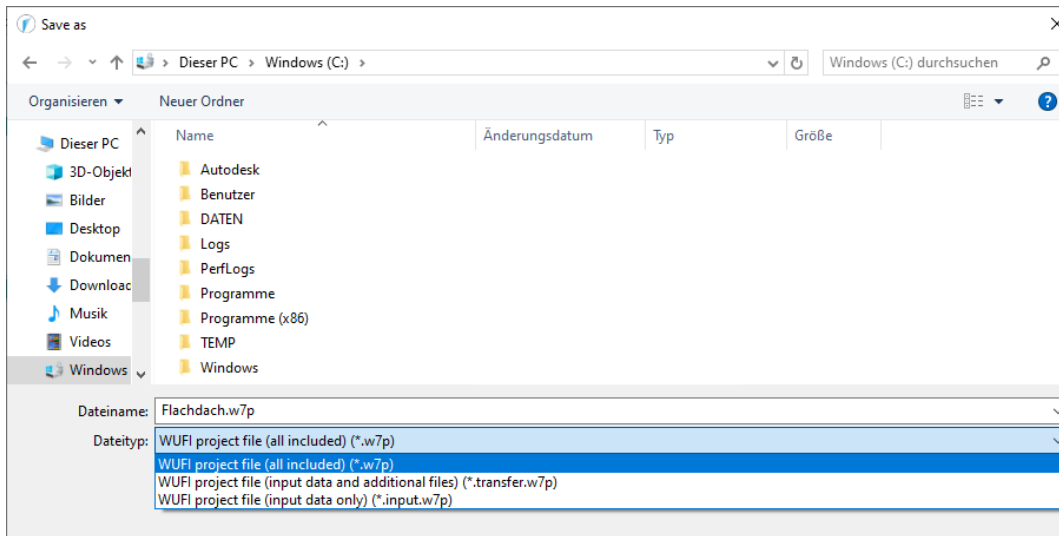
# New User Surface

## Case Data Summary



# Others

## New saving options

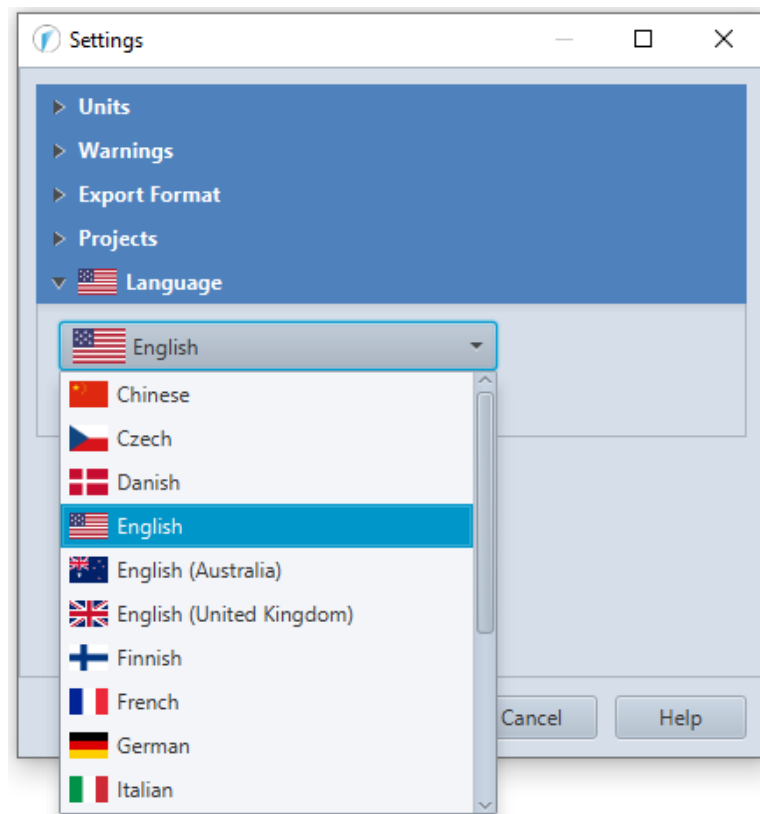


### Project file save as:

- **\*.input.w7p:**  
Only the input data is saved.
- **\*.transfer.w7p:**  
The input data and additional files, such as imported source files or your own climate data, are saved.
- **\*w7p:**  
The input data, additional files and the results are saved.

# Others

## Language Database



### New Language Databases:

- Country-specific expressions possible
- Material names and info text of the materials can contain country-specific information (units, contact)

# Others

## New WUFI® Graph

