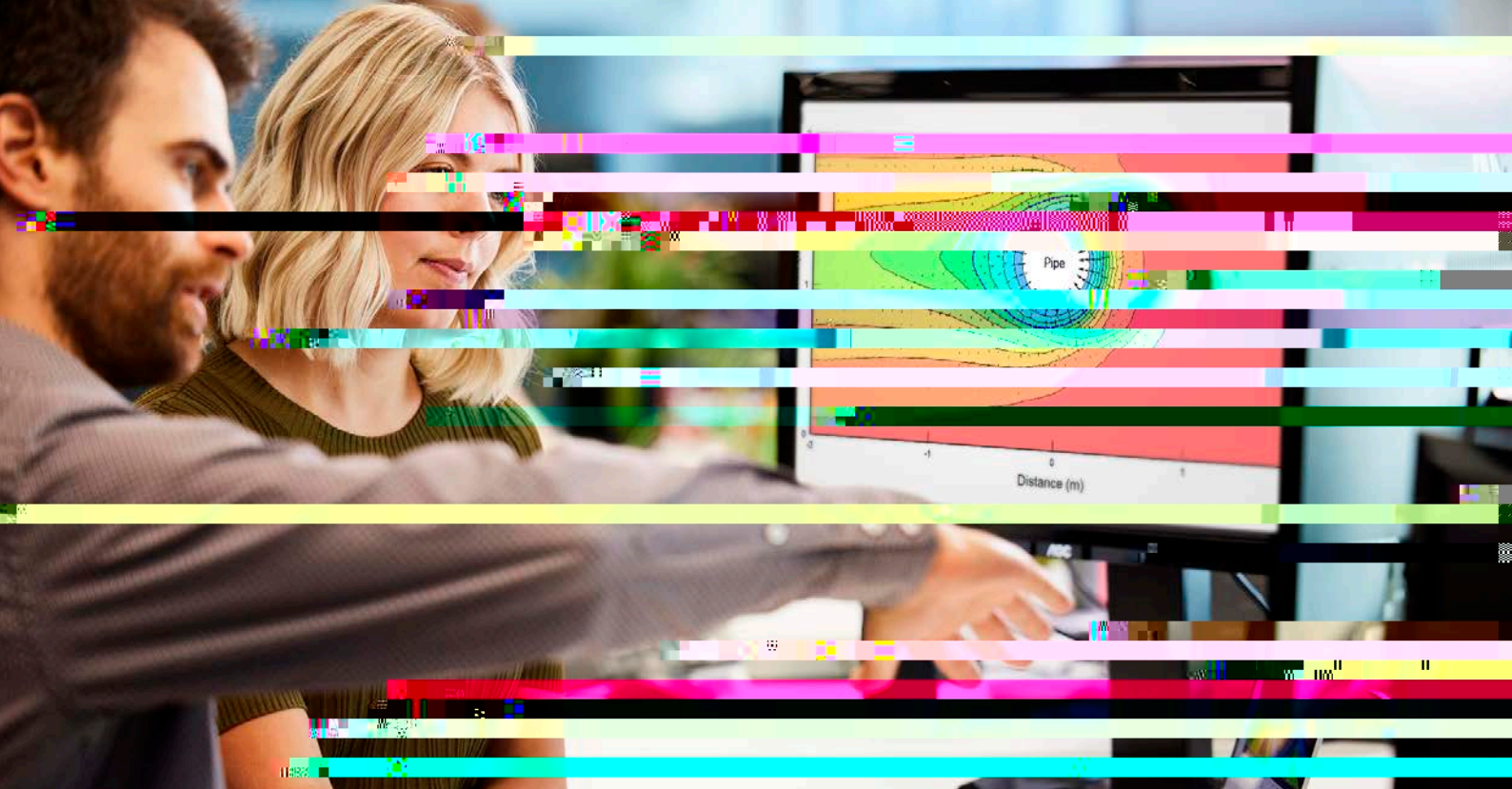# TEMP/W

TEMP3D

Heat Transfer Analysis

TEMP/W is a powerful finite element software product for modeling heat transfer and phase change in porous media. TEMP/W can analyze simple conduction problems to complex surface energy simulations with cyclical freeze-thaw.

Add TEMP3D to TEMP/W to analyze 3D heat transfer using the same comprehensive set of material models and boundary conditions.

Boundary Conditions

TEMP/W and TEMP3D offer a range of boundary condition options, including a rigorous thermosyhpon boundary condition. The convective heat transfer boundary condition allows for simulation of artificial ground freezing or other processes involving the fluid flow over a bounding surface.

Integration

Heat transfer is often governed by forced convection in natural hydrogeological systems. TEMP/W can be fully-integrated with SEEP/W and AIR/W to analyze heat transfer via groundwater flow or air flow, respectively. Integration of TEMP3D, SEEP3D, and AIR3D is also available.

Material Properties

Thermal functions defining the material properties for saturated-unsaturated soils can be estimated using built-in functions. The rigorous phase change formulation provides an accurate solution to problems involving freeze-thaw of saturated-unsaturated porous media.

Land-Climate Interactions

Analyse problems that involve a coupling between climatic conditions and the thermal response within the ground in TEMP/W using the surface energy balance boundary condition.