

# SALT INTRUSION GENT-TERNEUZEN

## ELEMENTARY FINEL3D CALCULATIONS

The Flemish-Dutch Scheldt Commission (VNSC) performs a “no regret” research program that studies the possibilities for further economic development of the Kanaalzone Gent-Terneuzen (KGT area). Several economical scenarios have been defined, as well as various alternative measures for the extension, broadening or deepening of the three current ship locks near Terneuzen.

All these measures will influence to a certain extent the annual amount of sea salt that intrudes the channel area, by means of ship lock manipulations and dispersion due to navigation. Salt intrusion forms a threat for agricultural water supply and bears also other disadvantages, e.g. for fresh-water ecology.

VNSC has requested Svašek Hydraulics and Royal Haskoning to develop a simple model tool (in spreadsheet format) that enables KGT area policy makers quickly to assess the effects of various measures and scenarios on the Kanaal Gent Terneuzen with respect to salt intrusion. The spreadsheet model was constructed by Royal Haskoning based on available measurement data, economic scenario forecasts and elementary salt intrusion

calculations performed by Svašek Hydraulics, using the finite element model FINEL3D.

For each different ship lock geometry present in the project alternatives, the salt intrusion on the channel due to density currents during Terneuzen ship lock manipulations was calculated in 3D as a function of time. Also the effects of several mitigating measures (e.g. water jets, air bubble jets, discharge ducts, bottom level differences) were assessed. It is concluded that a smart combination of these mitigating measures is able to strongly reduce the effective salt intrusion into the KGT area. The results of the 3D calculations were used to calibrate the spreadsheet model tool by Royal Haskoning.

CLIENT

Vlaams-Nederlandse Scheldecommissi

LOCATION

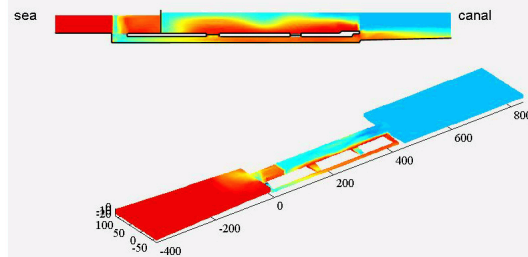
Channel Ghent-Terneuzen,  
the Netherlands

DATE

2009 - 2010

SERVICES

2DV and 3D density current calculation  
using FINEL3D



**SVASEK**  
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