Paragraph 1. Dense effluents discharged into the ambient water negatively influence the local environment. Brine discharged from reverse osmosis (RO) desalination plants is an example of dense effluents on which I focused for my MS thesis. Researches have shown that this type of effluents should be released into the ambient water using an inclined nozzle below the sea surface. As a result, an Inclined Negatively Buoyant Jet (INBJ) forms and propagates into the ambient water, as shown in the animation. In the following paragraphs, I briefly explain some of the results obtained from Large Eddy Simulations (LES) of INBJs I've performed.

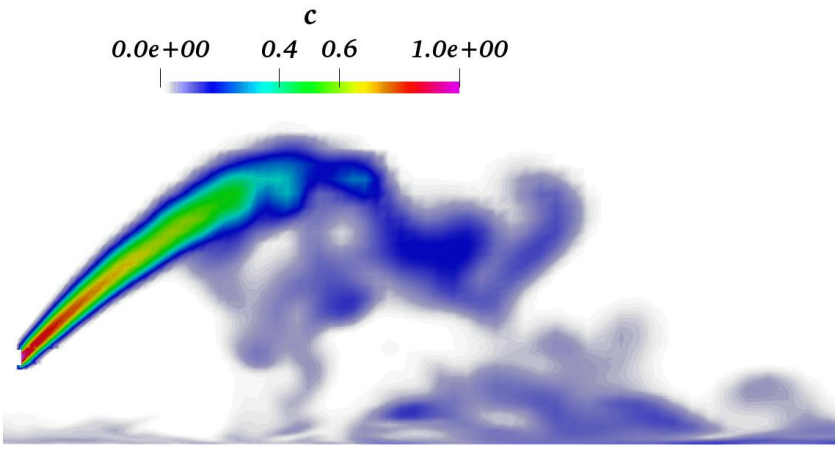

Figure 1. *Instantaneous middle plane concentration field of an INBJ obtained from LES.*

Paragraph 2. I am eager to study fundamental turbulent mixing mechanisms responsible for observations of the bulk flow behaviour. In this regard, I use the Q-criterion to identify coherent structures of INBJs, as shown in the figure.

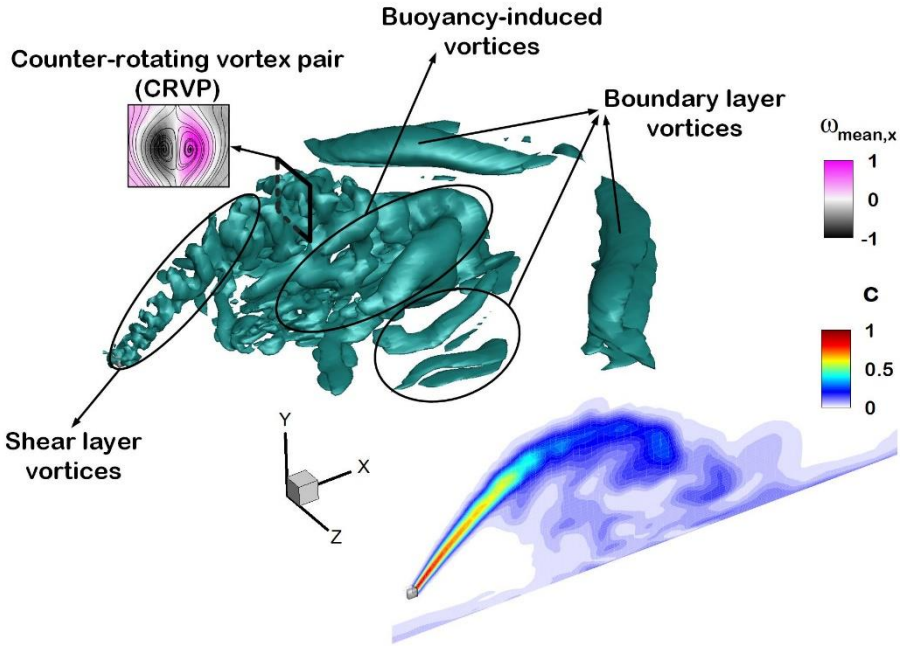

Figure 2. *Identification of coherent structures of an INBJ.*

Paragraph 3. Since the sea bed is sloped in many regions where INBJs are usually released, finding an optimum combination of nozzle and bed angles is of interest to researchers. The figure shows that changing these angles significantly alters the behaviour of INBJs.

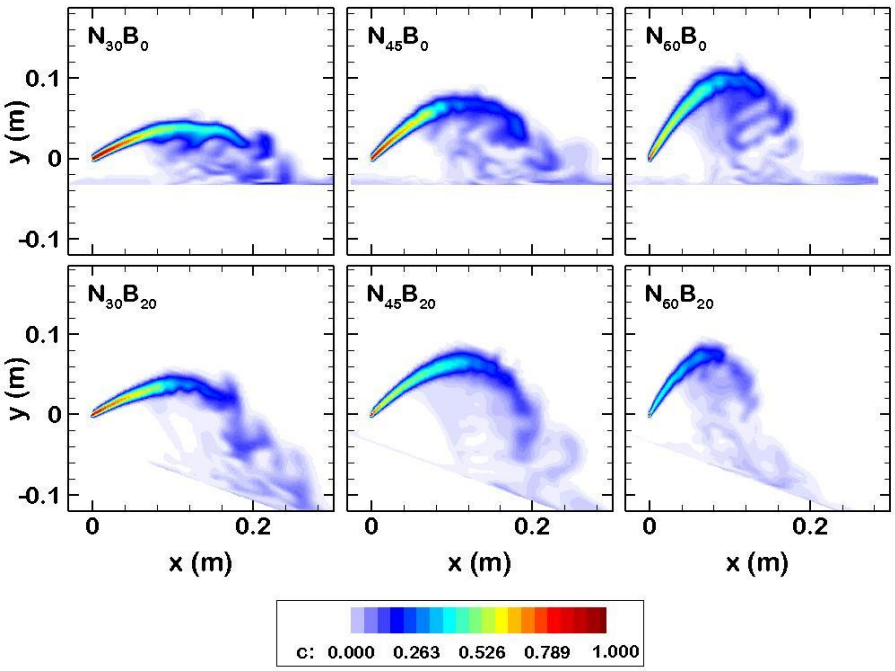

Figure 3. *Instantaneous concentration fields of INBJs with different combinations of nozzle and bed angles.*

Paragraph 4. After the INBJ impinges the bed, a density current forms on the bed and propagates into the ambient. The bed slope could dramatically change the patterns formed on the bed.

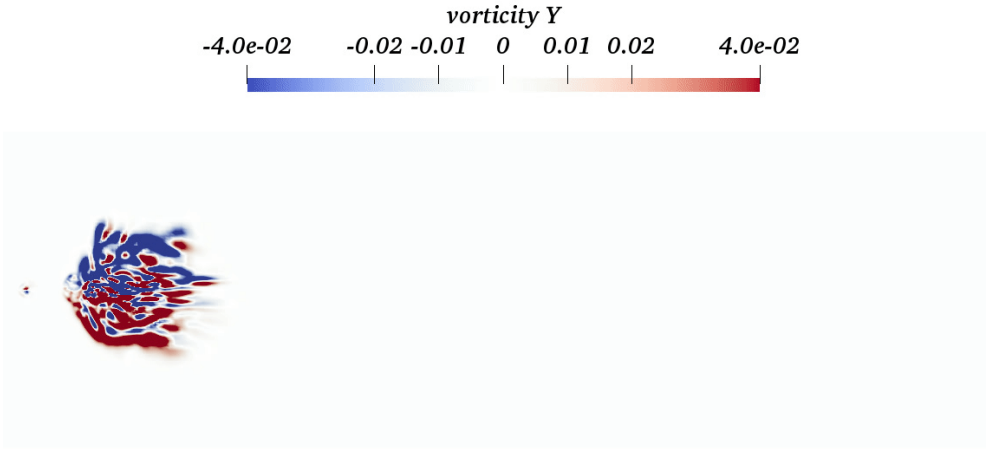

Figure 4. *Instantaneous vertical component (normal to the bed) of vorticity field on the bed.*