uSimCurrent: Simulating Drift Effects

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1 Overview

The `uSimCurrent` MOOS application is a newcomer in the toolbox and documentation is thin. Nevertheless it has been tested and used quite a bit and is worth a quick introduction here for those with a need for some ability to simulate water current on unmanned vehicles.

`uSimCurrent` is intended to be used with the `uSimMarine` simulator, by generating drift vectors and publishing them to the MOOSDB. The `uSimMarine` simulator has a generic interface to accept externally published drift vectors regardless of the source, written to the variables `DRIFT_X`, `DRIFT_Y`, and `DRIFT_VECTOR`. The `uSimCurrent` application reads a provided *current field file* containing an association of water current to positions in the water. On iteration of `uSimCurrent`, the vehicle's current position is noted, looked up in the current-field data structure, and a new drift vector is posted. The idea is shown in Figure 1.
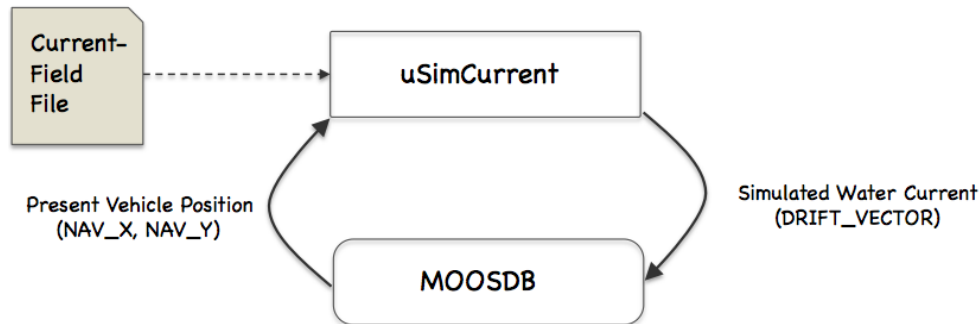

Figure 1: **The `uSimCurrent` utility:** The simulator is initialized with a data file describing currents and locations. The simulator then repeatedly publishes a current vector based on the present vehicle position.

2   Configuration Parameters for uSimCurrent

The following configuration parameters are defined for uSimCurrent. A more detailed description is provided in other parts of this section. Parameters having default values are indicated so.

Listing 2.1: Configuration Parameters for uSimCurrent.

current_field:	Name of a file describing a current field.
current_field_active:	Boolean indicating whether the simulator is active.

3   Publications and Subscriptions for uSimCurrent

The interface for uSimCurrent, in terms of publications and subscriptions, is described below. This same information may also be obtained from the terminal with:

```
$ uSimCurrent --interface or -i
```

3.1   MOOS Variables Published by uSimCurrent

The primary output of uSimCurrent to the MOOSDB is the drift vector to be consumed by the uSimMarine application.

- DRIFT_VECTOR: drift vector representing the prevailing current. See the uSimMarine documentation.
- USC_CFIELD_SUMMARY: Summary of configured current field.
- VIEW_VECTOR: Vector objects suitable for rendering in GUI applications.

3.2   MOOS Variables Subscribed for by uSimCurrent

Variables subscribed for by uSimCurrent are summarized below.

- NAV_X: The ownship vehicle position on the x axis of local coordinates.
- NAV_Y: The ownship vehicle position on the y axis of local coordinates.