**Exploration**

Before the agents can start working they need to know where the embankment should be located and where they can find their building material. Since we can save a lot of time by optimizing this procedure we decided to choose this as one of our topics of research. For this reason, we implemented multiple exploration strategies to find out which works best.

The first exploration strategy is the most basic one can image, the agents move random. And when they have found everything, all depots and the entire shoreline, their desire switches to building. For this we compare two separate ways to move random through a space. In first strategy the agent moves with every step in a random direction. The second strategy is that the agent moves straight, until it hits an object after which it will move to a different random direction. Both strategies make use of a function that as soon as one is at the shoreline, the agent will move along that shoreline.

1. Random walk (random patch)
2. Random walk (random direction on bump)
3. Follow shoreline

Although the agents work together in the first exploration strategy, this is not really efficient, since all robots are busy exploring while there is already the possibility to start building. Therefore, in our second exploration strategy we will, as soon as one depot is known and one piece of shoreline is known, all agents but one will change their desire to building the embankment. The agent that first found the coastline will get the task to continue observing until everything is build. We might want to expand on this and have more agents stay on the exploration team, this will be the people closest to the sea. The agents will therefore have to communicate to see where they fit in this team.

1. Random walk (random direction on bump)
2. Set of agents commences building before exploration is finished.
3. Communicate about distance to shoreline to decide who stays and who doesn’t, agent that detected shoreline will continue to explore the shoreline after which it will commences building.