In [1]:
```
import arlpy.uwapm as pm
import arlpy.plot as plt
import numpy as np
```

In [2]:
```
pm.models()
```

Out[2]:
```
['bellhop']
```

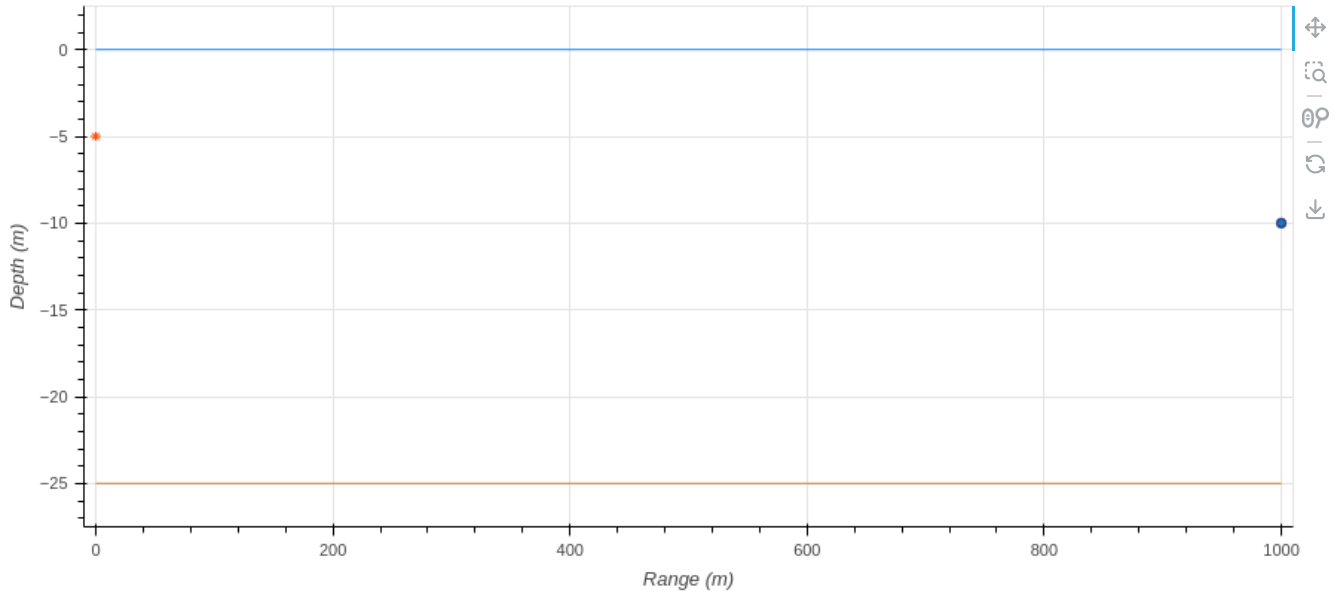
In [3]:
```
!which bellhop.exe # 2023 exe build on Linux (OS - Ubuntu 20.04 LTS)
```

```
/home/jay/Documents/newat/at/Bellhop/bellhop.exe
```

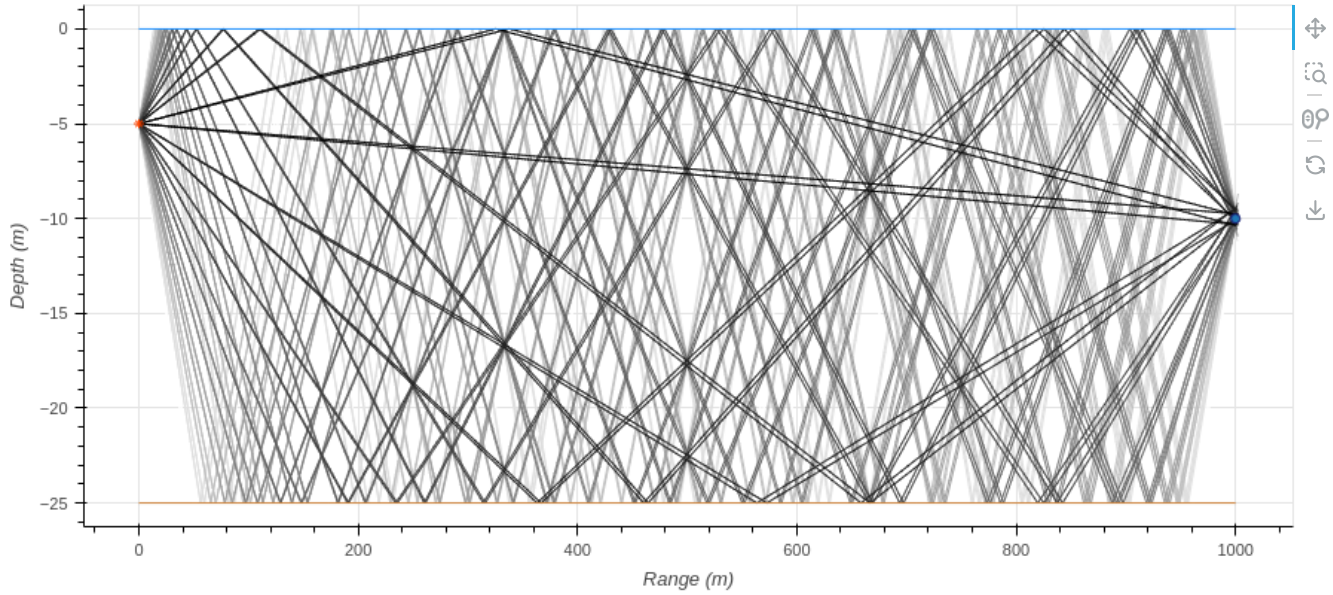
In [4]:
```
env = pm.create_env2d()
pm.print_env(env)
```

```
              name : arlpy
bottom_absorption : 0.1
   bottom_density : 1600
 bottom_roughness : 0
bottom_soundspeed : 1600
             depth : 25
      depth_interp : linear
         frequency : 25000
         max_angle : 80
         min_angle : -80
            nbeams : 0
          rx_depth : 10
          rx_range : 1000
        soundspeed : 1500
soundspeed_interp : spline
           surface : None
   surface_interp : linear
          tx_depth : 5
tx_directionality : None
              type : 2D
```

In [5]:
```
1 pm.plot_env(env, width=900)
```

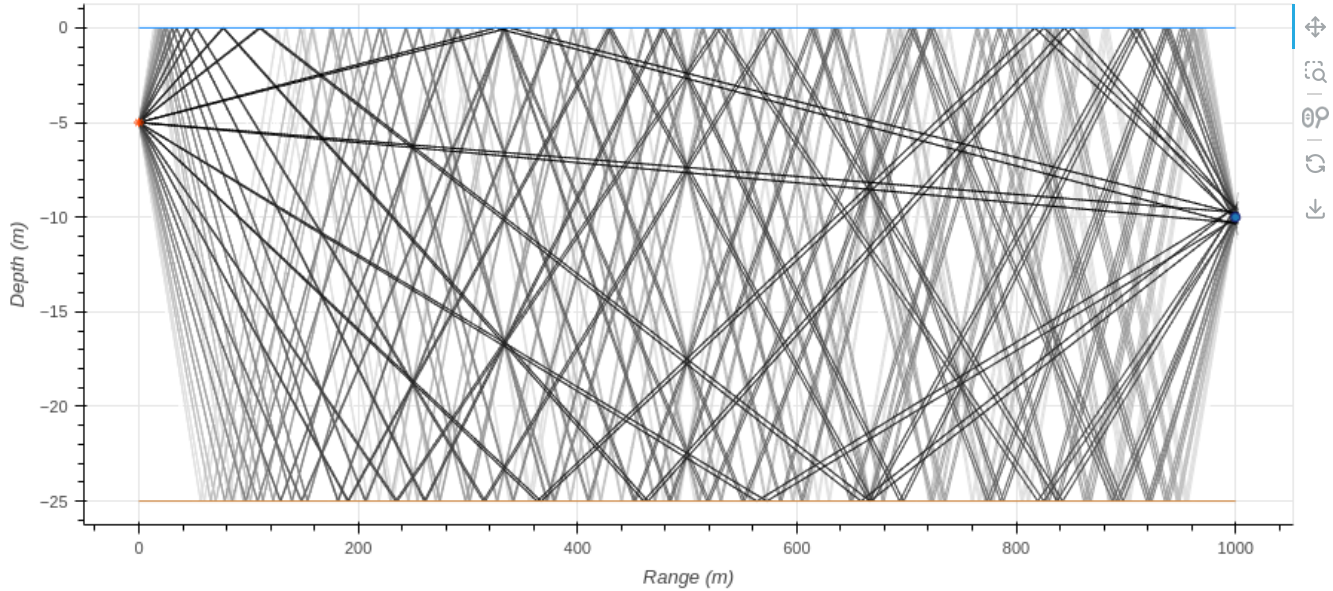


In [6]:
```
1 rays = pm.compute_eigenrays(env)
2 pm.plot_rays(rays, env=env, width=900)
```



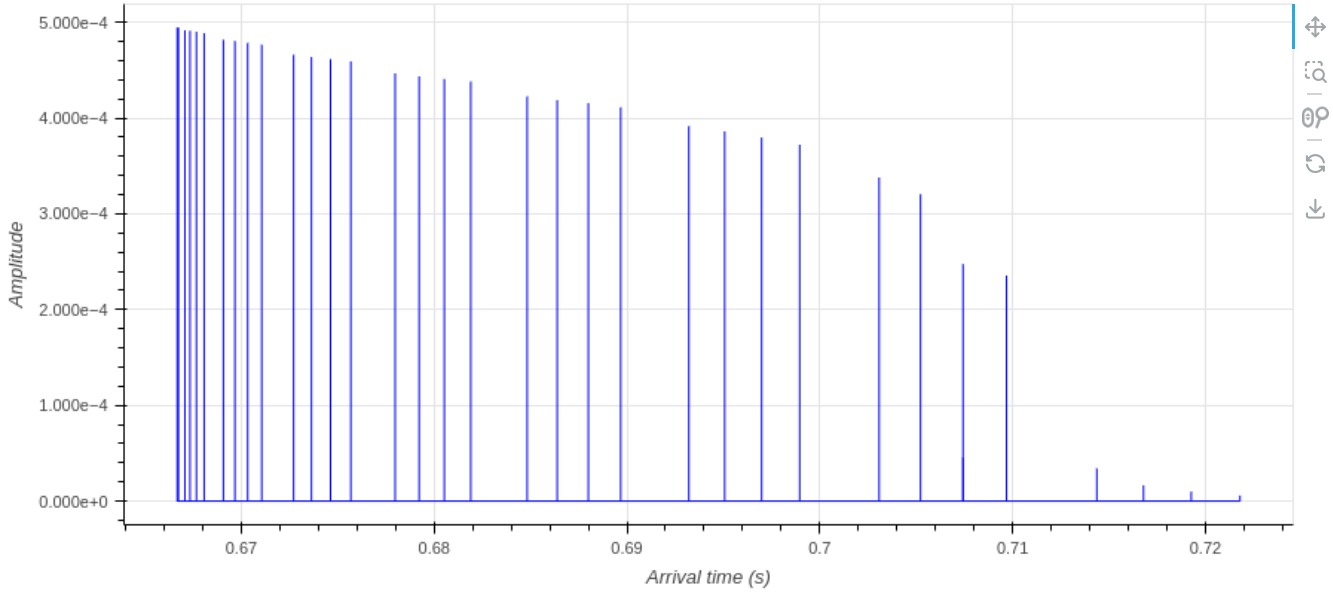
In [7]:
```
rays = pm.compute_eigenrays(env,debug=True)
pm.plot_rays(rays, env=env, width=900)
```

```
[DEBUG] Model: bellhop
[DEBUG] Bellhop working files: /tmp/tmpwm_qflny.*
```



In [8]:
```
arrivals = pm.compute_arrivals(env, debug=True)
pm.plot_arrivals(arrivals, width=900)
```

```
[DEBUG] Model: bellhop
[DEBUG] Bellhop working files: /tmp/tmpgw89pwge.*
```



In [9]:
```
arrivals[arrivals.arrival_number < 10][['time_of_arrival', 'arrival_amplitude', 'angle_of_arrival', 'surface_bounces', 'bottom_bounces']]
```

Out[9]:

	time_of_arrival	arrival_amplitude	angle_of_arrival	surface_bounces	bottom_bounces
1	0.721796	-5.345778e-06-2.367754e-06j	22.538252	9	8
2	0.716791	7.827161e-06+1.457859e-05j	-21.553991	8	8
3	0.709687	-4.552358e-07-2.436653e-07j	20.084017	8	7
4	0.709687	-2.161610e-04-9.366950e-05j	20.052010	8	7
5	0.705226	-1.553080e-04+2.801340e-04j	-19.034414	7	7
6	0.698960	2.048742e-04-3.106344e-04j	17.484421	7	6
7	0.695070	-3.671107e-04+1.185680e-04j	-16.436060	6	6
8	0.689678	6.193695e-05+4.064829e-04j	14.842224	6	5
9	0.686383	4.156857e-04-5.102108e-05j	-13.766296	5	5
10	0.681901	3.545845e-04+2.568755e-04j	12.133879	5	4

In [ ]:
```

```