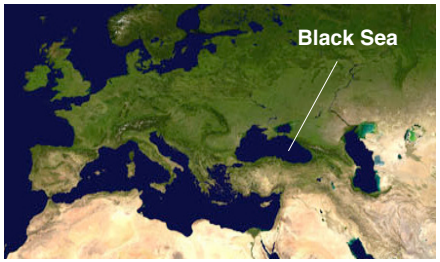
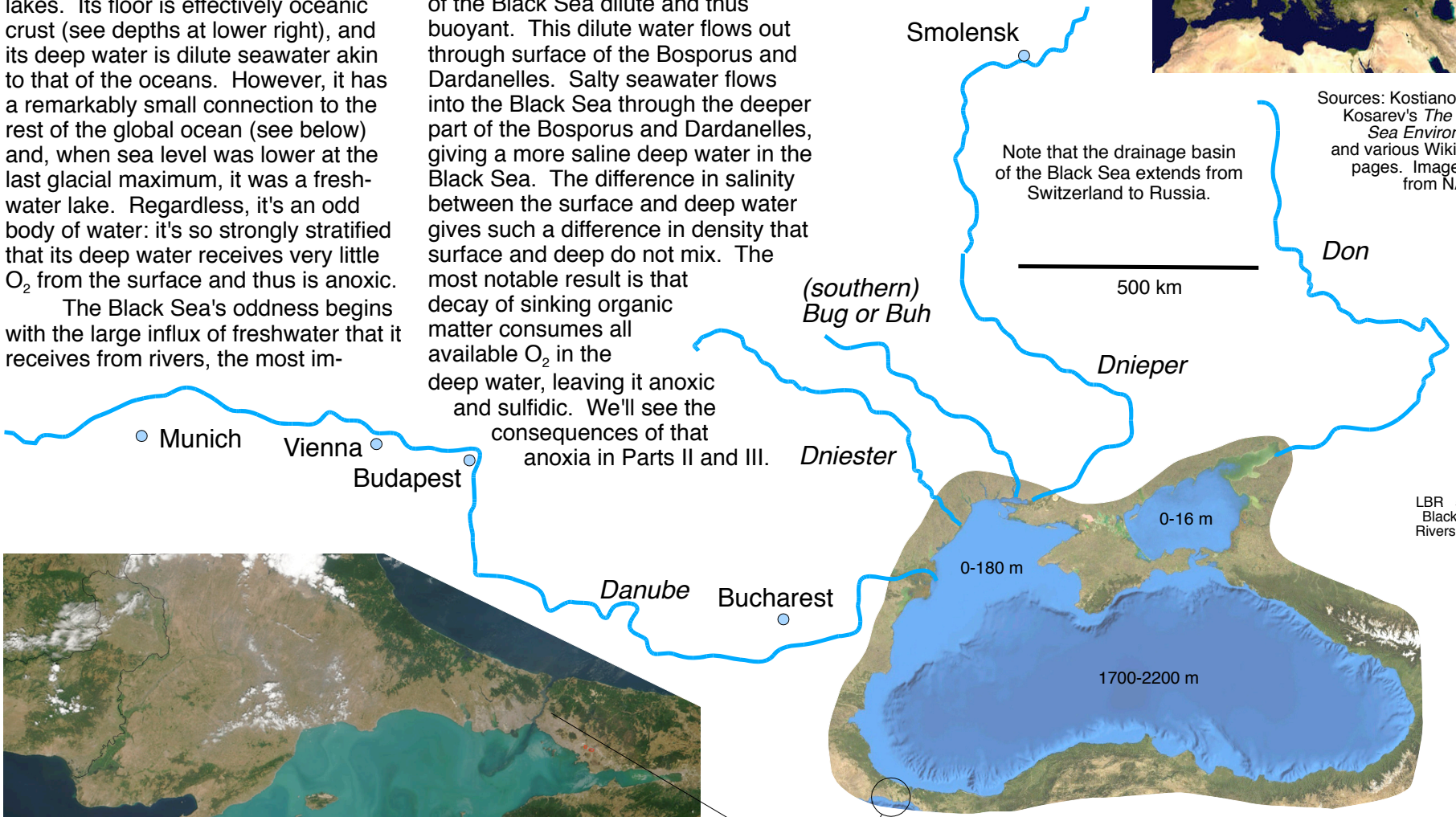
The Black Sea I: Geography

The Black Sea is at the boundary between oceanic seas and continental lakes. Its floor is effectively oceanic crust (see depths at lower right), and its deep water is dilute seawater akin to that of the oceans. However, it has a remarkably small connection to the rest of the global ocean (see below) and, when sea level was lower at the last glacial maximum, it was a freshwater lake. Regardless, it's an odd body of water: it's so strongly stratified that its deep water receives very little O_2 from the surface and thus is anoxic.

The Black Sea's oddness begins with the large influx of freshwater that it receives from rivers, the most important of which are shown here. That influx makes the surface water of the Black Sea dilute and thus buoyant. This dilute water flows out through surface of the Bosporus and Dardanelles. Salty seawater flows into the Black Sea through the deeper part of the Bosporus and Dardanelles, giving a more saline deep water in the Black Sea. The difference in salinity between the surface and deep water gives such a difference in density that surface and deep do not mix. The most notable result is that decay of sinking organic matter consumes all available O_2 in the deep water, leaving it anoxic and sulfidic. We'll see the consequences of that anoxia in Parts II and III.



Sources: Kostianoy and Kosarev's *The Black Sea Environment* and various Wikipedia pages. Images are from NASA.



The Bosporus: 30 km long, 700 m wide at its narrowest, and 36 m deep at its shallowest.

The Dardanelles: 60 km long, 1.2 km wide at its narrowest, with an average depth of 55 m.

For comparison, the Strait of Gibralter is 14.2 km wide at its narrowest and 300 to 900 m deep.