The ring current is a torus-like region of high plasma pressure in the inner magnetosphere. The ultimate source of the particles that constitute the ring current is the ionosphere and the solar wind. The particles originating from the ionosphere and the solar wind are thought to be mixed in the near-earth plasma sheet, and conveyed to the inner magnetosphere by the large-scale convection electric field. Thus, the plasma sheet is an important supplier of the ring current, regardless of the origin of the particles. We show some simulation results regarding the impact of the plasma sheet on the ring current and the sub-auroral ionosphere. The simulation results were compared with the mid-latitude SuperDARN HF radar. A possible role of substorms in the ring current will be discussed.