The ecology of hydroelectric dam

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The damming of the river has profound change to watersheds. The creation of storage and head allows dams to generate electricity. Nothing alters a river as totally as a dam. A reservoir is the antithesis of a river, the essence of a river is that it flows, the essence of a reservoir that it is still. Every dam site has unique geological characteristics. Gaining a thorough understanding of these characteristics is expensive and time consuming. The builders just hope that they will not find any unstable formations which will fail to support their foundations or cause the roofs of their tunnels to come crashing down. Similarly with the hydrological data, a dam traps sediments and nutrient, alters the river's temperature and chemistry, and upsets the geological processes of erosian and deposition throught which the river sculpts the surrounding land.

It is well established that large dams can trigger earthquakes. Today there is evidence linking earth tremors and reservoir operation for more than 70 dams. Reservoir-induced seismicity (RIS) has been observed for dams over 100 meters high. Dam can both increase the frequency of the earthquakes in areas of already high seismic activity and cause earthquakes to happen in areas previously though to be seismically inactive.

Dam and reservoir operation is not dictated by optimization rules but by the struggles of interest groups. The inflexibility of hydropower in terms of its siting is paralleled by the inflexibility to cope with changes in the rate of growth of energy demand over the many years it takes to plan and construct large dams. Energy demand forecasts consistently overestimate future needs of electricity in the name of sustainable economic growth.

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