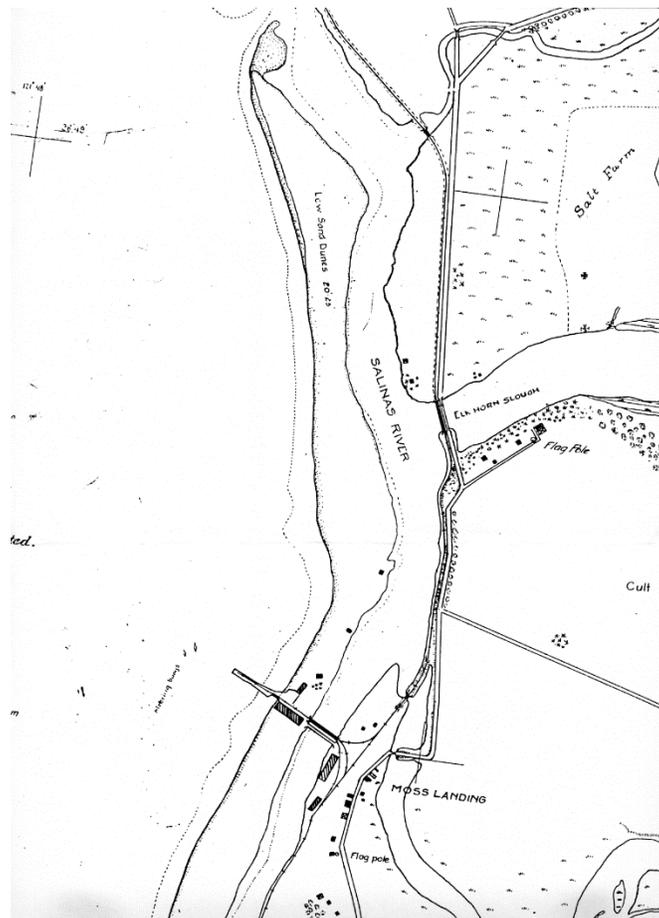


Our Ocean Backyard — *Santa Cruz Sentinel* columns by Gary Griggs, Distinguished Professor of Earth and Planetary Sciences, UC Santa Cruz.

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Harvesting Salt From the Sea**



Natural salt ponds at Elkhorn Slough, 1910

Many of us think about the salt in seawater as an unfortunate component that makes all of those 335 million cubic miles of ocean water out there unusable for most purposes. And there are many arid regions around the world, mostly in the Middle East and North Africa, but also in California, where we spend considerable money and energy to get the salt out of the water. What's interesting is that the salt is actually worth far more than the water.

The average salinity of seawater is 3.5% by weight, which doesn't sound like much. It's equivalent to just 8 tablespoons of salt in a gallon of freshwater, enough to make it completely undrinkable and not of any use for agriculture.

Yet our bodies need a small amount of salt every day – which chemically is sodium chloride – and salt has been used throughout the thousands of years of human civilization as a food preservative and seasoning. Salt's ability to preserve food was an important step in the development of human civilization as it reduced the dependence on seasonal availability of food and made it possible to preserve food and transport it over long distances.

Virtually all of the earliest civilizations harvested, traded or used salt; whether the Chinese, Hebrews and Hittites, Greeks and Romans, or Byzantines, they all valued salt. Historically, salt was often difficult to obtain, which made it a highly valued trade item. It was even used as an early form of currency in some places. Those peoples or regions that had salt deposits grew wealthy from the trade or use of salt, and many governments throughout history have taxed salt as a way of generating income and subjugating people. Salt was traded across the Mediterranean by ships, carried across the desert by camels, and even used as currency in parts of Africa.

The history of Portugal and salt is long and romantic. Salt production through solar evaporation of seawater was introduced by the Phoenicians in the 9th century BC. During the Roman period, salt must have been intensively exploited, as there are abundant archaeological remains of fish salting settlements in several places in southern Portugal.

Interestingly, the word “salary” came from the Latin word “salarium”, which referred to money paid to the Roman soldiers to purchase salt. Even more bizarre, the word salad, literally means “salted”, and originated from the ancient Roman practice of salting leafy vegetables.

The first known document related to Portuguese salt works dates from the 10th century, when a countess donated salt marshes to a monastery that she founded. A century later, the Algarve region of southern Portugal was shipping salt across Europe; in the 15th and 16th centuries, salt helped make Portugal a global power. It is even believed that funds generated by salt production in southern Spain financed the voyages of Christopher Columbus, and the salt tax in France was one of the causes of the French Revolution.

There have been basically just two sources of salt throughout history: the evaporation of seawater, which leaves the salt behind, and mining rock salt, or the mineral halite (sodium chloride), which was left behind as ancient seas or lagoons evaporated millions of years ago.

In this era of trying hard to be natural and organic, no matter what label or name is on that container of salt you buy at your favorite grocery store (“sea salt”, “organic salt”, “extra-virgin salt”), it all came from the sea at one time or another and is essentially all the same stuff. Some salts do have iodine added, which is an essential trace element.

All of the world’s salt comes from the evaporation of seawater, whether this took place last year, or a hundred million years ago from an ancient ocean and is now preserved as rock salt in places like Kansas, New Mexico, Texas, Florida and a number of other state and countries.

A century or so ago we had our own local source of salt that was developed and operated by a Portuguese family with long roots in the Moss Landing area. Natural salt ponds near the mouth of Elkhorn Slough were used for commercial salt production and are labeled on one of the early maps from 1910. In fact, the word salinas is Spanish for salt ponds or salt marshes. More to come on local salt.