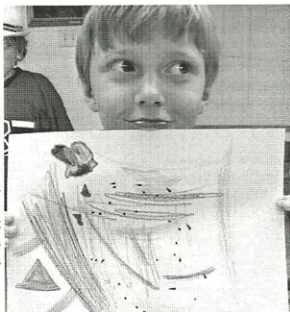


## IMTA: An Ecosystem Approach to Farming the Sea

Grand Manan Museum — M.J. Edwards, Curator/Director

IMTA stands for "Inter-Multi-Trophic Aquaculture", the farming of different aquaculture species together in a way that allows one species' wastes to be recycled as feed for another. It is an ecologically sustainable and balanced method of farming the sea being developed and promoted by Dr. Thierry Chopin, a marine biologist at the University of New Brunswick, Saint John campus. "IMTA systems combine an aquaculture species that requires external feeding (e.g. salmon and other finfish) with species capable of deriving nutrients from the wastes of the 'fed' species. By recycling nutrients that would otherwise be wasted, IMTA systems offer aquaculturists the potential of increased economic gains. IMTA systems could also lead to "greener" aquaculture practices through the reduction in waste products in the marine environment – as well as a decreased risk of algal blooms and cloudy water." (*Canadian Aquaculture Industry Alliance*). Dr. Thierry Chopin is an enthusiastic and engaging speaker, and



Saul Fitzsimmons made a lovely abstract interpretation of IMTA: Fallout from fish feeds the shellfish and fallout from them feeds the nearby kelp beds.

on July 12th he gave a very informative free youth workshop in the afternoon, and an evening public lecture the same day, at the Grand Manan Museum.

The idea behind IMTA is to create a sea farm environment of finfish, shellfish and seaweeds in pens near to each other so that they make maximum use of nutrient and waste consumption. The different species feed each other and clean and de-acidify the ocean in the process. Such a polyculture approach to sea farming means more than one cash crop is produced, and what

was a nuisance and waste before (the mussels that grow on the cages which formerly were scraped off as 'biofouling' and dumped) now has economic value. In the Bay of Fundy, IMTA farmed species might be Atlantic Salmon, Blue Mussels, and Kelp. Other species – such as lobster, shrimp, different species of finfish and seaweed – could also be used, depending on where in the world you are. The waters around Grand Manan are well suited to such aquaculture practices, and some experimental farms are already operating in different parts of the Bay of Fundy, as well as on the west coast of Canada in BC.

While the IMTA method of aquaculture in the Bay of Fundy is relatively new (a decade or so), the idea of integrating fish and aquaculture farming is old, dating back to a Chinese document from 2200-2100 BC which discusses the mutual benefit of combined fish and aquatic plant farming. In Asia the practice of farming seaweeds in conjunction with other shell and finfish species is wide-spread, with over 90% of the world's seaweed production taking place in just six countries. This means that our local harvesting of dulse and rockweed, though significant to us, is really very small, making up only 4% of the world's harvested seaweeds.



Drayden Cheney is happiest when drawing and is proud of his "how to make sea lettuce pudding" schematic drawing.

In the afternoon, from 1-3 pm, Dr. Chopin conducted a free youth workshop attended by 16 children, held in the Museum's Lecture Hall. First they made a vanilla seaweed pudding. While they were making the pudding, Dr. Chopin explained the science behind using sea lettuce as the binding agent (it is a good source of "carrageenan"), and while the pudding was gelling in the freezer, he showed them a series of slides which taught the children about IMTA practices and the importance of seaweeds in general. Did you know that half of the world's oxygen supply comes from the sea? That without healthy oceans and the many species of seaweed, we'd find it very hard to breathe? We tend to think of the forests and other land-based vegetation as our main oxygen producers, but in fact, as we learned, algae and seaweeds are crucial to a healthy planet. Near the end of the workshop, the children sampled the pudding - some liked it okay, one girl liked it a lot, and others were less enthusiastic (I think some chocolate flavouring next time perhaps?). Our student employee, Holley Sturgeon, and I both thought it was great! About half of the children made some



Making the pudding, Dr. Chopin squeezes the last of the goodness out of the sea lettuce cheesecloth "tea bag".

day. On behalf of the Grand Manan Museum board and staff, we thank Dr. Thierry Chopin, one of many excellent speakers we had in our programme this summer, for taking the time to visit Grand Manan and teach us about this important aquaculture practice. We hope to see it growing in popularity, practice and prosperity in the years to come.

**Irish Moss Pudding:** Irish moss is a good source of

carrageenan, a thickening agent used in ice cream, salad dressing, toothpaste, puddings and paints. Try out this recipe for Irish moss pudding:

**Ingredients:**

- 1/2 cup of dried Irish moss (or one cup fresh, washed Irish moss)
- Three cups of milk
- 1/3 cup of sugar
- 1/8 tsp. of salt
- 1 tsp. of vanilla

If using dried Irish moss, soak it in water for fifteen minutes. Tie the Irish moss up into a "tea bag" bundle using cheese cloth. Soak the Irish moss "tea bag" in three cups of milk in the top of a double boiler and cook over boiling water for twenty-five minutes (or, microwave the milk until very hot and soak and squeeze the cheesecloth sea lettuce bundle for several minutes in the hot



Abigail Jamieson made two drawings, one is about the importance of kelp beds.

inspired art in response to what they'd learned. (Visit Dr. Chopin's IMTA Lab website for more information and to see how different areas of the arts have responded to IMTA: <http://www2.unb.ca/chopinlab/imta/arts/index.html>)

It was really a fun and inspiring



Jerika Sveinson made a great drawing too!

....See page 13



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Continued fr. Pg 9 — Dr. Chopin demonstrates how you can flip the tray over and the pudding won't fall out.



milk). Add sugar, salt and vanilla. Stir the mixture and pour it into individual molds. Chill and serve plain or with berries on top.

**Note:** To make chocolate seaweed pudding, melt a square and a half of unsweetened chocolate, add a half cup of sugar and a third of a cup of boiling water, and stir until smooth. Add this to the above recipe (excluding the one-third cup of sugar). □

Tasting the vanilla sea lettuce pudding!

