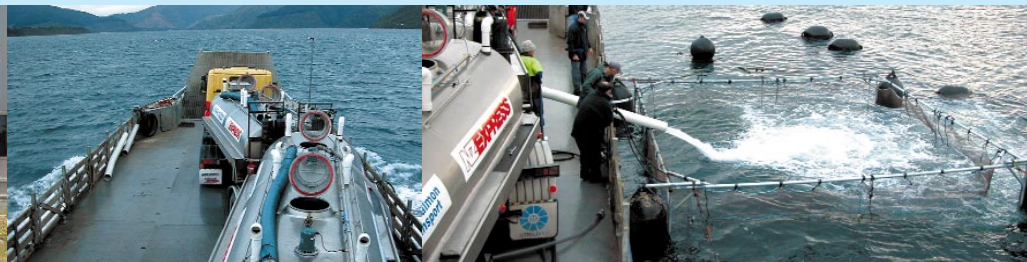


Commercialisation

Ecological engineering eliminates wastewater

NIWA's Advanced Pond Systems (APS) are a series of wastewater treatment ponds, each designed to optimise a natural treatment process using clever ecological engineering. As well as providing excellent treatment of conventional pollutants, APS also achieves near-tertiary treatment (in terms of nitrogen and phosphorus removal) and superior removal of pathogens and indicator bacteria. The technology is particularly suitable for the treatment of municipal sewage from small to medium sized communities and for farm dairy shed wastewater because it is simple to operate, cost-effective, and, as well as producing reusable water, also produces recoverable nutrients and enough energy (in the form of methane) to power the farm. There is an acute need for this technology because many existing wastewater treatment plants (mainly conventional oxidation ponds) are not meeting the requirements of the Resource Management Act, and need to be upgraded.

www.niwa.co.nz/aps



Commercial kingfish

Kingfish production at NIWA's state of the art hatchery at Bream Bay reached new heights this year with 30 000 juvenile fish being produced and sold to Island Aquafarms Ltd in Crail Bay, Marlborough Sounds – the first commercial kingfish aquaculture in New Zealand. NIWA also gained valuable experience in transporting fish, using our salmon transporter, which took more than 20 hours, but resulted in mortality of only 0.7%. These hatchery and transportation successes form the basis for a rapid commercialisation of the species through aquaculture.

Seed shortage solved

One of the main obstacles to cultivating paua is the shortage of seed. Last year the NIWA hatchery at Mahanga Bay was possibly the largest seed supplier in New Zealand, rearing and selling over 170 000 high quality seed and 20 million larvae to five commercial paua farms. For 2003–04 the production target is over 300 000 seed. One of the notable sales was the supply of 25 000 seed to a new venture near Gisborne. This operation is remarkable because it is 8 km from the sea and relies on a high technology water recirculation system, designed by NIWA scientists, to provide the optimum environment for growth while using less than 0.01% of the water used by conventional farms. The seed are currently growing in the system at more than twice the rate normally achieved by the industry.



Bob Hickman





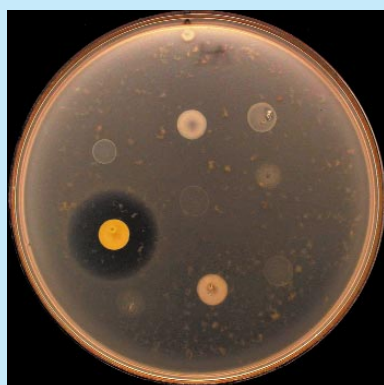
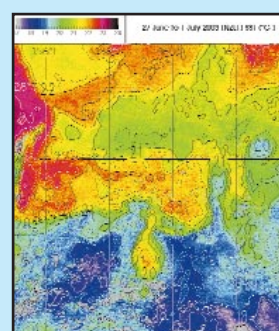
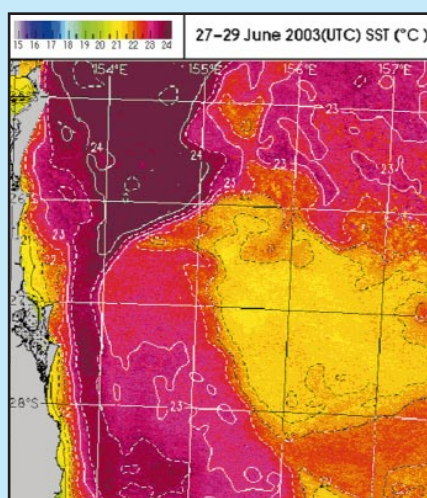
Salmon sales strong

NIWA continues to play an important role in the salmon aquaculture industry, supplying stock to many New Zealand farms. This role has expanded significantly this year with the development of a new partnership with Sanford Ltd to produce salmon smolt for rearing at their farm in Big Glory Bay, Stewart Island. A key factor in this development was the expertise and experience of hatchery staff at NIWA's Silverstream Research Station, who are now working closely with Sanford to provide a secure, early rearing environment for high performing broodstock selected from Big Glory Bay.

Satellite services to fishers

More than 1000 New Zealand and Australian fishers use NIWA web-based products to guide their fishing operations. High-resolution, sea surface temperature, catch targeting analyses and satellite imagery are generated in real time for users via the web or through *Sat-View*, an email-based system designed for use on vessels at sea. This service uses science developed in the FRST-funded 'Remote Sensing of Fisheries' research programme, and, since its inception in 1997, many New Zealand fishers have come to rely on it for planning vessel movements. More recently, Australian east coast tuna fishers have begun using it. They report that NIWA's services are more flexible, accurate, and cost-effective than those provided by Australian and US suppliers.

www.niwa.co.nz/services/sat/



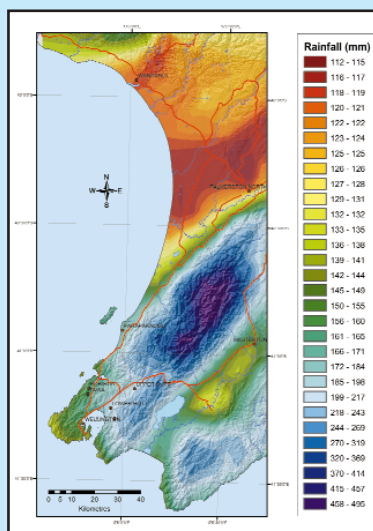
There are nine bacteria colonies on this agar plate. The colony with the clear zone of exclusion is producing an antagonistic substance which prevents growth of a pathogenic bacteria.

Beneficial bugs

An exciting range of beneficial bacteria for aquaculture have been identified through NIWA research. The good bacteria are known as probiotics and are useful in promoting good health, high settlement, and improved digestion in aquaculture species. The probiotic bacteria can crowd out disease-causing bacteria in hatchery cultures of, for example, paua larvae, and provide strong cues for the larvae to settle on ideal culture surfaces. Aquaculture probiotics have excellent global market prospects, with their use becoming increasingly common overseas, and NIWA aims to commercialise its first aquaculture probiotics within the next two years.

Better maps, better decisions

If you need to know more about your part of New Zealand, to help you decide, for example, whether you can grow and ripen riesling vines, whether there is potential for generating wind power, or whether you need to upgrade your flood protection scheme, we can map it for you. In fact, NIWA can map any aspect of climate for any part of New Zealand. We build our maps by use of a Geographic Information System (GIS) with information from the extensive national climate database, satellite data, and information from global-scale and local-scale climate models. We can even set up temporary climate stations to supplement the permanent station network. The results are attractive, highly visual images which provide essential climate information as a base for your specific project.



The map shows the 100-year return period 24-hour rainfall total, which is used, for example, in river flood estimation or to assess the frequency of storms.