Key global Ocean drivers, impacts, and solutions

Dr. Jean-Pierre Gattuso is a CNRS Senior Research Scientist at the Villefranche Oceanographic Laboratory. His research focuses on the impacts on the ecosystems of ocean acidification. He will be giving a seminar entitled "Key global ocean drivers, impacts, and solutions."

The ocean moderates anthropogenic climate change at the cost of profound alterations of its physics, chemistry, ecology, and services.

I will evaluate and compare the risks of impacts on marine and coastal ecosystems—and the goods and services they provide—for growing cumulative carbon emissions under two contrasting emissions scenarios. Ocean warming and acidification, sea-level rise and deoxygenation generated by the current emissions trajectory would rapidly and significantly alter many ecosystems and the associated services on which humans heavily depend.

A reduced emissions scenario consistent with the Paris Agreement of a global temperature increase of less than 2°C is much more favorable to the ocean but still substantially alters important marine ecosystems and associated goods and services. While ambitious mitigation and adaptation are needed, the ocean provides huge leeway for action to reduce climate change impacts on vital ecosystems and ecosystem services.

An assessment of 13 global- and local-scale measures shows that (1) all measures have tradeoffs and multiple criteria must be used, (2) greatest benefit is derived by combining global and local solutions, some of which can be scaled-up immediately, (3) some measures are too uncertain to be recommended yet, (4) political consistency must be achieved through effective cross-scale governance mechanisms, (5) scientific effort must focus on effectiveness, co-benefits, disbenefits, and costings of poorly tested as well as new and emerging measures.