Jean-Pierre Gattuso is CNRS Research Professor at the Laboratoire d'Océanographie de Villefranche, CNRS and Université Pierre et Marie Curie-Paris 6. His main research activity relates to the cycles of carbon and carbonates in coastal ecosystems. In 1995, he began working on the response of marine organisms and ecosystems to ocean acidification. He was the Scientific Coordinator of the FP7 large-scale integrated project EPOCA (European Project on Ocean Acidification; 2008-2012) which aimed at advancing the understanding of the biological, ecological, biogeochemical, and societal implications of ocean acidification. The EPOCA consortium comprised more than 160 researchers from 32 institutes and 10 European countries. He still pursue active research on the impacts of ocean warming and acidification on marine organisms and ecosystem services. Jean-Pierre Gattuso is also the Founding chair of the SOLAS-IMBER Ocean Acidification Working Group, led the launch of the Ocean Acidification International Coordination Center and co-edited the first book on ocean acidification. He is the Founding President of the European Geosciences Union (EGU) Biogeosciences Division, Founding editor-in-chief of the journal Biogeosciences. He received the Vernadsky medal of the EGU in 2012 and the Blaise Pascal medal of the European Academy of Sciences in 2014. He is a member of European Academy of Sciences.

**Risks of warming, deoxygenation and acidification for oceans and society**

Anthropogenic CO2 emissions generate large-scale changes in ocean physics and chemistry which in turn have consequences on natural marine and human systems. I will review (1) past and projected ocean warming, deoxygenation and acidification, (2) risks for organisms, ecosystems and ecosystem services, and (3) solutions to avoid these risks. The increase in sea water temperature and acidity, as well as the decrease in oxygen content, have profound impacts on physiological, ecological and biogeochemical processes. Consequently, there are significant risks for future ecosystem services such as carbon storage, coastal protection, fisheries and recreational services. These impacts and risks are significant even for the moderate emission scenario that would enable to fulfil the Copenhagen Accord of limiting the global atmospheric temperature to 2°C. Most of these risks become very high with higher CO2 emission scenarios on the trajectory of which we currently are. It is critical that ocean issues are brought into the international political process, including negotiations as part of United Nations Framework Convention on Climate Change.

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**暖化、脱氧和酸化对海洋和社会造成的风险**

人为的二氧化碳排放形成了海洋物理与化学状态的大规模变化，这反过来又对自然海洋和人类系统造成了严重的后果。我要谈论的内容有：（1）过去与未来的海洋暖化、脱氧和酸化；（2）生物、生态系统和生态供给风险；（3）面对风险的解决方案。海水升温和酸化，如同氧含量减少，对生物生理、生态和生物地理化学左右有着深远的影响。因此，未来生态供给如碳储备、海岸保护、渔业和近岸娱乐活动将存在显著风险。而在二氧化碳中等排放期时，全球气温上升值将达到哥本哈根公约限定的2摄氏度，而这些影响与风险将尤其显著。按照如今的二氧化碳排放轨迹，排放量继续增加会使大多数的风险变得非常高。因此，将海洋问题纳入国际政治进程，包括作为《联合国气候变化框架公约》一部分，是至关重要的。