TITOLO PROGETTO

EARLYhumanIMPACT - How long have human activities been affecting the climate system?
Linea finanziamento: VII FP - ERC GA
Area Scientifico Disciplinare: 04_ Scienze della Terra

DOCENTE RESPONSABILE SCIENTIFICO : BARBANTE Carlo

DATI FINANZIARI

Costo Complessivo del Progetto	Finanziamento Complessivo Assegnato	Costo totale delle attività a Ca' Foscari	Assegnazione Complessiva a Ca' Foscari
2.370.767,00	**2.370.767,00**	**2.370.767,00**	**2.370.767,00**

INIZIO ATTIVITA' (previsione)
2011

FINE ATTIVITA' (previsione)
2016

ABSTRACT PROGETTO

Human activities including fossil fuel burning are currently altering the global climate system at rates faster than ever recorded in geologic time. Ample observational evidence exists for anthropogenic climate change including measured increased in atmospheric carbon dioxide, associated temperature and sea level rise, and changes in ocean and atmospheric circulation. Biomass burning causes carbon dioxide emissions equal to 50% of those from fossil-fuel combustion and so are highly likely to influence future climate change. However, aerosols continue to be one of the least understood aspects of the modern climate system and even less is known about their past influence. Anthropogenic aerosols may have altered the global climate system for thousands of years as suggested by comparing late-Holocene greenhouse-gas (GHG) concentrations to those from previous interglacials1,2,3. The decrease in the spatial extent of forests beginning ~7000 years BP may be related to early agricultural activity3 including forest clearance through burning which should leave a quantifiable signal in climate proxies.
My research group has pioneered a ground-breaking technique for measuring a globally present molecular marker of biomass burning (levoglucosan, 1,6-anhydro-β-D-glucopyranose) which can quantify past fire as recorded in ice cores and lake sediments. The proposed research incorporates continuous ice and lake core climate records from seven continents with parallel histories of fire activity. These fire histories can provide essential insight into the interplay between climate and human activity, especially with the advent of agriculture, as well as the role of aerosols through time. Key objectives to be answered include:
1) How does biomass burning change through time and space?
2) How do climate parameters respond to or correlate with changes in biomass burning?
3) Did fires increase ~7000 and/or ~5000 years ago?
4) Can natural and anthropogenic fires be differentiated? If so, how do fires and associated climate change ascribed to human activity differ from natural biomass burning?