

I+D+i

Ejercicio 7

Apartado 1

California supports rich fisheries off its coast. The high productivity of fish is supported by high rates of algal production. Algal growth in the ocean is typically limited by nitrogen supply, but this is high off California because N-rich deep water wells up to the surface along the coast. This upwelling is driven by winds that push the south-flowing surface water away from the shore, allowing deep water to rise to the surface. These off-shore winds are driven by regional climate patterns, including El Niño, that are being intensified by the greenhouse effect, which results from increased CO₂ in the atmosphere. Increased CO₂ in the atmosphere also increases the amount of CO₂ dissolved in the ocean, which reacts with water to form carbonic acid (H₂CO₃), reducing the ocean's pH. This reduced pH makes it hard for shellforming organisms to make calcium carbonate shells, and so may reduce the productivity of important marine species such as abalone, oysters, and even sea urchins. Thus, increasing atmospheric CO₂ is going to have many important effects on marine ecosystems.

Apartado 2

Semantic Web encourages digital libraries which include open access journals, to collect, link and share their data across the web in order to ease its processing by machines and humans to get better queries and results. Linked Data technologies enable connecting structured data across the web using the principles and recommendations set out by Tim Berners-Lee in 2006.

Apartado 3

- 1) Neither calculation reproduces the experimental strength distribution. The distribution for GXPF1A is closer to the data, but it pushes the strength up too high in excitation energy. An even more dramatic increase occurs for the calculation with KB3G, although the strength integrated up to 7.5 MeV reproduces the experimental value quite well. The summed B(GT) strength up to $E_x = 7.5$ MeV (a total of 48 states) for the KB3G interaction is $\sum B(GT)_{KB3G} = 2.02$ (with a further 10% of that value located at energies up to 10.3 MeV) compared to the experimental value of 1.95 ± 0.14 up to that excitation energy. The summed strength up to $E_x = 7.5$ MeV with the GXPF1A interaction is $\sum B(GT)_{GXPF1A} = 2.65$. A further 8% of that value is located at higher excitation energies, fragmented over many weak states.
- 2) Although much of the research in the field of pharmacotherapy for the secondary prevention of PTSD after trauma is speculative, there is theoretical evidence that early use of anti-anxiety agents can be effective. Pitman and Delahanty argued that pharmacotherapeutic interventions for the prevention of PTSD will be most effective if medication regimens are implemented after exposure to traumatic events. Morgan and colleagues and other investigators have hypothesized that opiates may interfere with or prevent memory consolidation through a beta-adrenergic mechanism. This theory also lends support to the idea that morphine and other opiates may prove effective in the secondary prevention of PTSD after trauma.

- 3) We conclude that the increase of the diurnal temperature range [DTR] over the United States during the three-day grounding period of 11–14 September 2001 cannot be attributed to the absence of contrails. While missing contrails may have affected the DTR, their impact is probably too small to detect with a statistical significance. The variations in high cloud cover, including contrails and contrail-induced cirrus clouds, contribute weakly to the changes in the diurnal temperature range, which is governed primarily by lower altitude clouds, winds, and humidity.
- 4) If the Great Plains mammoths routinely undertook long-distance migrations, then mammoths at all of the Clovis sites in this study should display similar $^{87}\text{Sr}/^{86}\text{Sr}$ ratios. However, the Dent mammoths display $^{87}\text{Sr}/^{86}\text{Sr}$ ratios that are distinct from those of mammoths at Blackwater Draw and Miami, demonstrating that the Dent mammoths belonged to a distinct population. Thus, we conclude that Great Plains mammoths did not routinely migrate between northern Colorado and the southern High Plains, which are separated by about 600 km.

Apartado 4

Adding compost to soil promotes microbial growth, which then increases microbial production of phosphatase enzymes that release plant-available P from organic matter. *Bromus carinatus* is a native grass that can be used in reestablishing California grasslands. Its success in P-poor systems can be stimulated by inoculation with mycorrhizal fungi. However, the effects of mycorrhizal inoculation of *Bromus carinatus* on P uptake have not been assessed.

Apartado 5

Academics of prestigious universities release through OER websites, high-quality educational materials that can be reused by educators or students in their own learning environments [6].