LETTERS

Edited by **Jennifer Sills**

Time to return blue skies to Iran

BETWEEN OCTOBER 2015 and February 2016, Iran's Meteorological Organization issued multiple "red status" warnings for the local air quality index. In Tehran, schools, construction sites, and polluting factories were closed, smoke-belching cars were fined or towed away, and vulnerable populations were advised to stay indoors. Other Iranian cities have also frequently suffered from extreme air pollution, with lethal consequences (*1*, *2*). Apart from dust storms in some western cities of Iran, many specialists blame Iran's poisonous air on the quantity and quality of the gasoline consumed in the country (*2*, *3*).

Tehran, Iran has suffered multiple "red status" warnings for air quality.

Iranian gasoline consumption is skyrocketing as vehicle numbers soar (*4*). It hit 25 billion liters in 2013 (*5*)—or about 323 liters per capita, which is double that of the average EU citizen (*6*). Not surprisingly, in 2013 Iran's national greenhouse gas emissions reached the ninth highest in the world (*7*).

Gasoline quality is also problematic, and well below global standards. During a decade of sanctions, import restrictions forced the pursuit of self-sufficiency. Iran ramped up domestic gasoline production by converting petrochemical plants to refineries. Substitute—or ersatz—fuel produced in such plants has been shown to be underrefined and heavier in pollutants than gasoline from refineries built for fuel production. Although regulations require ersatz gasoline to meet Euro-4 levels and the government is now seeking to reduce local production with imports, some politicians allege that local fuel meets only Euro-2 standards (*8*).

Consequently, Iranian air quality is well below that of its Persian Gulf neighbors. Qatar consumes twice as much gasoline, but air pollution is only 20 μg/m³, half that of Iran (*9*). Sanctions also crippled Iran's ability to equip new vehicles with catalytic converters for pollution control (*2*). Old domestically made "gas guzzlers" dominate the roads, often belching heavy smoke. Energy efficiency is low in industry, too, because generous government fuel subsidies encourage wasteful practices (*10*).

With sanctions now lifted and government recognition of air pollution mounting, the time is ripe for international cooperation to clean up Iranian skies. This requires a comprehensive approach in energy production and use. Oil consumption must be curbed by ramping up vehicle fuel efficiency standards and lowering fuel subsidies. Enforcement of gasoline quality standards is also crucial. Lastly, Iran's government must invest in clean public transportation to decrease growing vehicle and gasoline dependency.

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The age of the Twitter conference

CONFERENCES ALLOW RESEARCHERS to present findings, exchange ideas, and develop networks. Unfortunately, they also incur high financial costs for participants and high environmental costs in the form of carbon emissions associated with air and other travel. Twitter—already popular with many academics (*1*)—can reach large audiences in a short period of time. We propose that global Twitter conferences could be a cost-effective and low-carbon complement to traditional conferences.

The World Seabird Union hosted Twitter Conferences in 2015 and 2016. The 2016 conference featured 72 presenters from 11 countries. Each presenter had 15 minutes to present six tweets (at 140 characters each). The constraints forced presenters to be succinct and use photographs, infographics, or animations to explain their work. The 2016 World Seabird Twitter Conference hashtag (#WSTC2) was used by 633 people in 3931 posts, compared with the 540 people who wrote 2700 posts tagged with the 2015 hashtag (#WSTC1). The success and growth of these events demonstrate the effectiveness of Twitter as a peer-to-peer platform for scientific interaction and science communication.

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Subsidizing truly open access

IN HIS NEWS In Depth story "Dutch push for a quantum leap in open access" (15 April, p. 279), M. Enserink details the European Union initiative to make all EU-published papers open access (OA) by 2020, echoing previous European ideas (*1*). We agree with the initiative's goals but not with its emphasis on a Gold OA model, in which authors pay for both editorial production and the publisher's profit margin. Mesmerized by a quick fix for wealthier European nations and institutions, Berlin 12 Open Access (*2*) and the Max Planck Digital Library (*3*) support Gold OA. However, the Association of Research Libraries and others have pointed out that Gold OA publishing fees constitute a barrier to full global participation in scholarly communication and exacerbate economic and political marginalization (*2*, *4*, *5*).

We advocate a fundamental shift to a Platinum OA system, in which external subsidies, instead of authors, cover publication fees, allowing free access to scientists submitting papers as well as those accessing published content. Many projects and models are exploring the Platinum OA landscape (*6*, *7*), and about 70% of OA journals already have this system (*8*, *9*). However, Platinum OA could be expanded if noncommercial publishers (e.g., scholarly societies) prioritized open communication over short-term profit [e.g., from contracts with commercial publishers (*10*)]; in tandem, academic institutions can incrementally reinvest institutional resources currently dedicated to paying commercial access charges in platinum OA. This plan would open access to the entire scholarly community, avoid drainage of funding out of academia, and realign scholarly communication with academic and socially equitable goals.

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TECHNICAL COMMENT ABSTRACTS

Comment on "Sensitivity of seafloor bathymetry to climate-driven fluctuations in mid-ocean ridge magma supply"

Peter Huybers, Charles Langmuir, Richard F. Katz, David Ferguson, Cristian Proistosescu, Suzanne Carbotte

Olive *et al.* (Reports, 16 October 2015, p. 310) argue that ~10% fluctuations in melt supply do not produce appreciable changes in ocean ridge bathymetry on time scales less than 100,000 years and thus cannot reflect sea level forcing. Spectral analysis of bathymetry in a region they highlight as being fault controlled, however, shows strong evidence for a signal from sea level variation.

Full text at http://dx.doi.org/10.1126/science.aae0451

Response to Comment on "Sensitivity of seafloor bathymetry to climate-driven fluctuations in mid-ocean ridge magma supply"

J.-A. Olive, M. D. Behn, G. Ito, W. R. Buck, J. Escartín, S. Howell

Huybers *et al.* present new bathymetric spectra from an intermediate-spreading ridge as evidence for a primary contribution of sea-level cycles to the morphology of the seafloor. Although we acknowledge the possibility that sea level–modulated magmatic constructions may be superimposed on a first-order tectonic fabric, we emphasize the difficulty of deciphering these different contributions in the frequency domain alone.

Full text at http://dx.doi.org/10.1126/science.aaf2021

Subsidizing truly open access

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Editor's Summary