In this issue

Ayurveda, Systems and Network

In a General Article on **page 1127** in this issue, Rama Jayasundar from the All India Institute of Medical Sciences, New Delhi, explains the systems approach underlying the ayurvedic concepts of *dosha* and *guna*. She leverages on the interconnectedness between these parameters to apply network theory. This brings out the ingenuity underlying the management of a complex human system by Ayurveda.

In this systemic approach, disease is viewed as a system perturbation leading to functional failure. Treatment is comprehensive, addressing the causative factors. The author points out the interesting prospects of dialogue between systems biology and Ayurveda.

Surveying Samudra Tapu

The Samudra Tapu glacier in the North West Himalayas covers an area of more than 40 sq. km. Information about the changes in snow accumulation on different parts of the glacier at different times is useful to assess winter mass balance. However, the terrain here is difficult. And monitoring changes in snow on the ground is almost impossible.

Ground penetrating radar is a suitable technique for snow depth estimation and has even been used to detect buried objects. The velocity of electromagnetic waves depends on the dielectric constant of the medium. Data on the reflections, at the top of the snow and at the ground, can allow us to make reasonable estimates of the depth of the snow cover.

Scientists from the Snow and Avalanche Study Establishment, Chandigarh, the National Institute of Technology, Kurukshetra, and the Indian Institute of Science, Bengaluru, set out to survey Samudra Tapu.

They used a helicopter carrying an antenna that sends out 350 MHz signals. The signals bounce back and are recorded. These signal profiles are integrated with the GPS positioning of the helicopter.

The scientists criss-crossed the glacier and captured a large number of profiles in March 2009 and March 2010. Both times a field observatory was used to calibrate the profiles collected from the airborne survey. And in a Research Article on **page 1208** in this issue, they report that the estimated snow depth is in good agreement with manually measured snow depth.

Such airborne surveys, along with more field sampling sites, can improve the prediction of water availability from larger glacial sites. The scientists suggest the use of pre-installed sensors to make estimations of snow depth in glaciers more accurate.

Nandhaur Wildlife Sanctuary

Nandhaur Wildlife Sanctuary is a vital link between the Bramhadevand Sukhlaphata Wildlife Reserve of Nepal, the Terai Central and Ramnagar forest divisions of India, crucial for the movement of tigers, elephants, and other large-bodied animals, between India and Nepal.

The area was notified as a Wildlife Sanctuary by the State Government in 2012 as a crucial move to save the connectivity, which was being threatened by anthropogenic pressures such as overexploitation of forest resources and unsustainable river bed mining. Poverty and lack of opportunities in the area has made conservation of the Sanctuary a challenge.

In a Research Article on **page 1187** in this issue, scientists at the Wildlife Institute of India, Dehra Dun, explored the socio-economic pattern and identified the stakeholders and issues in the area, using household surveys and focus group discussions. In this issue, they present their findings on the social and ecological issues and the interplay of the factors responsible.

Decision makers and execution agencies will find some tips to improve the protection of the Sanctuary.

Reviewing River Water Quality

The Beas, a tributary of the Indus river system, originates in the Himalayas, in central Himachal Pradesh. Touching Kullu, Mandi and Kangra, it flows into Punjab and waters Gurdaspur and Hoshiarpur. The river enriches Jalandhar, Amritsar and Kapurthala...

Beyond sustaining human life, it houses an endangered dolphin and the smooth-coated otter. It is, therefore, important to monitor the quality of water in this river and to put breaks on rising contamination.

On **page 1138** in this issue, scientists from the DAV University and the Guru Nanak Dev University, Amritsar, now provide us a Review Article that compiles and statistically analyses available data from different points along the Beas, to evaluate the quality of surface water. Holistic data on the river will serve as baseline for monitoring river water and to take appropriate timely steps to retain its health.

Monitoring Martian Weather

From September 2014, the colour camera onboard the Mars Orbiter Mission acquired a few hundred images of Mars, from near and far. These images are good enough to map various morphological features and to monitor weather phenomena such as dust storms, dust devils, clouds...

But the spectral response of the camera is defined by the Bayer filters. This shows a large overlap: the red spectral region spills over into the signals measured in the blue and green bands. So it is difficult to distinguish ice-water clouds from clouds of dust.

The Mars mission does not have any imaging spectrometer or multispectral camera in the visible wavelength. So scientists have to make do with the spectral information available from the available images.

Scientists at the Space Applications Centre, the Indian Space Research Organization, Ahmedabad, have come up with a procedure to correct this spectral overlap and to derive radiance in three non-overlapping spectral bands. The data corrected for spectral overlap was used for the tentative identification of dust and ice clouds from their spectral signatures as well as other information such as geographic location and local time of observation. Read on from **page 1158**.

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