

Gobabeb FogNet

Monitoring the lifeblood of the Namib: fog

Jan Tolzmann

It has long been known that fog is a critical factor for biodiversity in the Namib Desert, both in the Namib Sand Sea and in all the other habitats that overlap with the fog zone. FogNet, a research project supported by the SASSCAL initiative, was developed to understand the dynamics of fog in the Namib Desert and to get long-term insight into how this may change as the earth's climate is changing. Here Jan Tolzmann, former project manager, explains the objectives and some technical details about the very sophisticated climate sensing instruments that are being erected in the central Namib.

It is eight o'clock on Saturday morning March 15th as a truck loaded with a container from Germany, from the Karlsruhe Institute for Technology (KIT) enters Gobabeb's gates. The whole FogNet team has been waiting in great anticipation for this container to arrive, because it contains instruments for nine meteorological tower stations. The arrival of the container is a major step on the long journey that Gobabeb has embarked on to understand the dynamics and controls of fog on the Namib Desert better. With the initialisation of the FogNet research programme, the investigation of the dynamics of Namib Desert ecosystems and their vulnerability to climate change enters a new stage at Gobabeb.

FogNet is a regional project within the SASSCAL (South African Science and Service Centre for Adaptive Land Use) initiative funded by the German

Bundesministerium für Bildung und Forschung. The principal investigator of FogNet is Dr Mary Seely. The main objective of the group is to understand the impact of regional climate change on the spatial fog production and in turn to the ecosystem.

Fog formation is associated with the upwelling of the cold Benguela Current and high pressure cells, which cause subsiding warm air masses. Eventually the warm air above the Benguela Current cools down until the dew point temperature is reached and fog occurs. Once the fog is formed it is driven by the sea breeze into the desert. Here it provides just enough moisture for most species to survive. However, this may change when in the future a potential warming of the Benguela Current may lead to reduced fog production. Until now there was a strong need to update scientific research and observe more closely the spatial fog distribution in the



“Gobabeb-Met”, one of nine similar weather stations that make up the FogNet array, being constructed in thick early-morning fog at the Centre. The other eight stations are arranged in two transects, one (E-W) from the coast to about 80km inland, and one (N-S) along the 400-500m altitude contour. As main reference station, Gobabeb-Met received more instruments than the others.

central Namib linked to climate change. Now FogNet fills this gap. Two teams are finalising the setting up of nine meteorological tower stations along a West-East and North-South transect through the Central Namib. When the stations are operating, different meteorological parameters such as fog precipitation, temperature, relative humidity and radiation will be measured simultaneously. Comparing data between stations will provide detailed information about the impact of climate change on fog distribution at the research area. The array of climatic stations is meant to provide the backbone for long-term studies, based at Gobabeb, concerning multiple aspects of the unique fog environment of Namibia's west coast and changes it may undergo in the future. This will include modelling studies to better understand the relationship between sea-surface temperature and fog. The scientific results of Gobabeb FogNet will help to understand the ecosystem and its relation to climate change.

However, FogNet is not only a research group but also a significant climate service center in the Namib Desert for the benefit of the entire population of Namibia. Moreover, FogNet offers training programs on meteorological instruments, data handling as well as interpretation for Namibian students. In addition, FogNet is very interested to cooperate with southern African Universities to establish Master and PhD projects located at Gobabeb.

For more information about the project and for information on how you could participate, contact Mary Seely (mary.seely@drfn.org.na) or Theo Wassenaar (theo.wassenaar@gobabeb.org).



The fog-adapted gecko *Pachydactylus rangei* (formerly *Palmatogekko rangei*), one of the many Namib endemics that may be affected by change in fog formation as a result of climate change. (Photo by Sebastian Kirchoff)

