

Sicherheitsforschung im Spannungsfeld globaler Herausforderungen

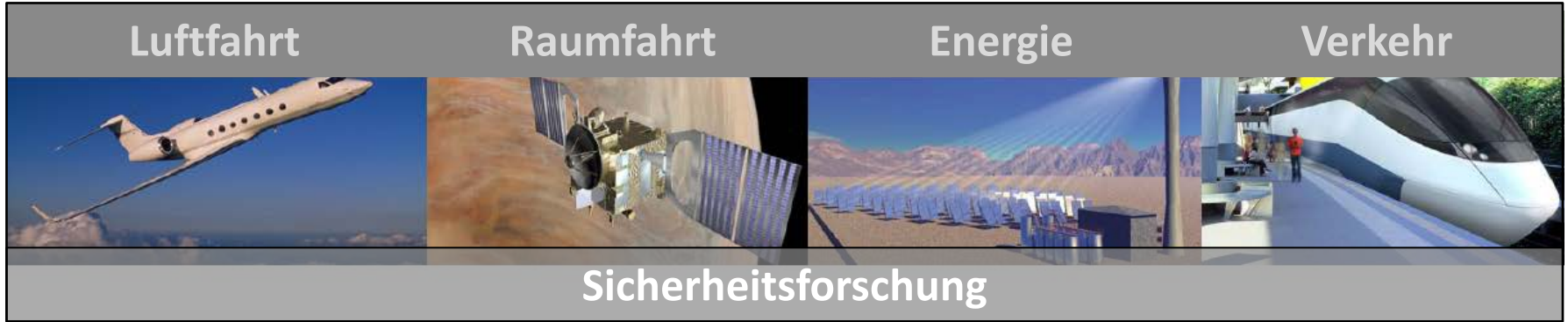
Festrede beim Neujahrsempfang des VBGU

Berlin, 19. Januar 2016

Peter Poete

Programmkoordination Sicherheitsforschung
Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR)





Deutschlands nationales Forschungszentrum
für Luftfahrt, Raumfahrt, Energie, Verkehr und
Sicherheit.

Raumfahrtmanagement

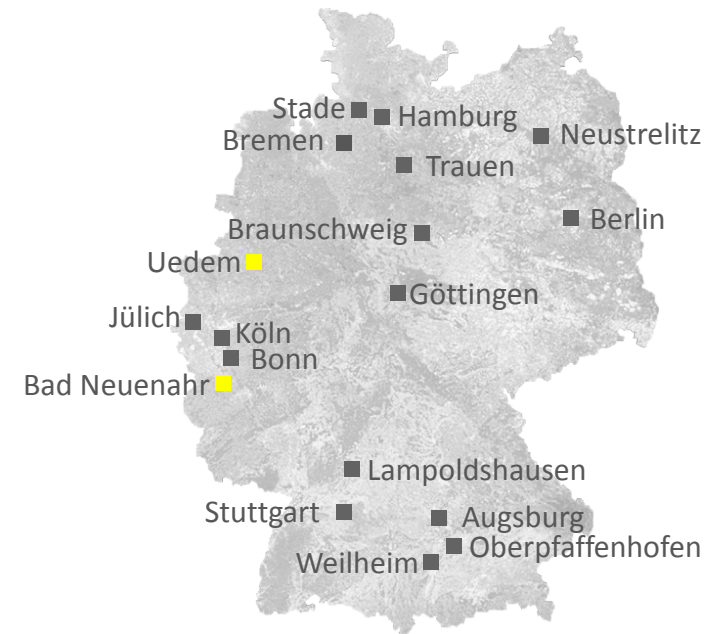
Projektträger

8000 Mitarbeiterinnen und Mitarbeiter

33 Institute und Einrichtungen an 16 Standorten

Büros in Brüssel, Paris, Washington DC und Tokio

Stationen in O'Higgins, Inuvik, Chetumal, Almeria





Teil der Helmholtz-Gemeinschaft deutscher Forschungszentren



HelmholtzZentrum münchen



Ein DLR – Drei Ziele

**Gesellschaftliche
Herausforderungen**



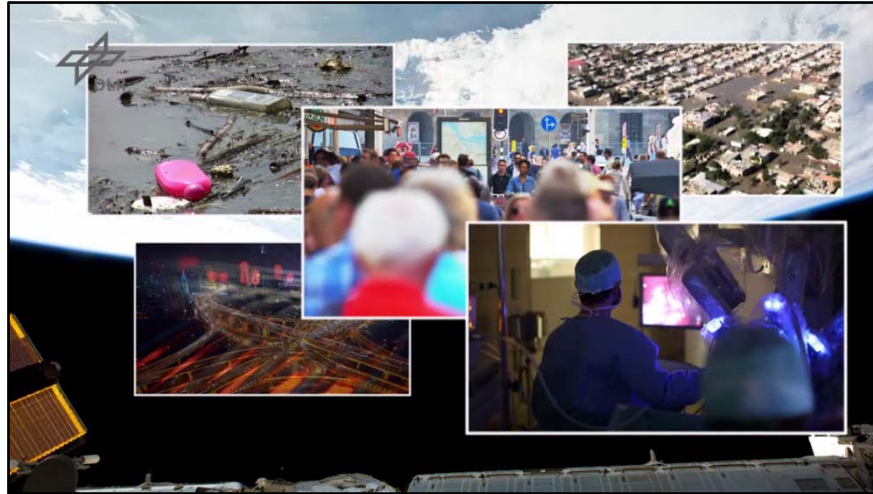
**Partner der
Industrie**

**Technologie
Innovationen
Industriepolitik**

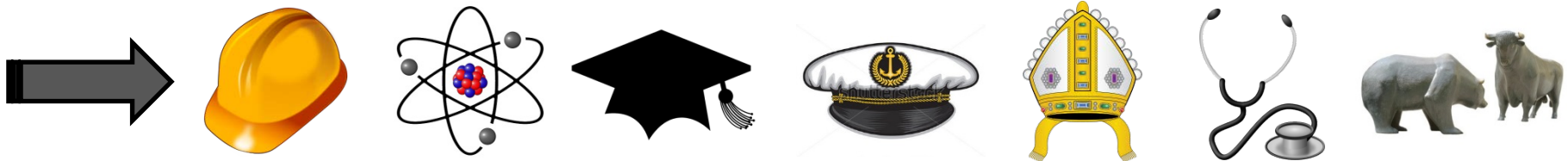
**Exzellente
Wissenschaft**

**Bildung
Forschungs-
Infrastrukturen
Spitzenforschung**

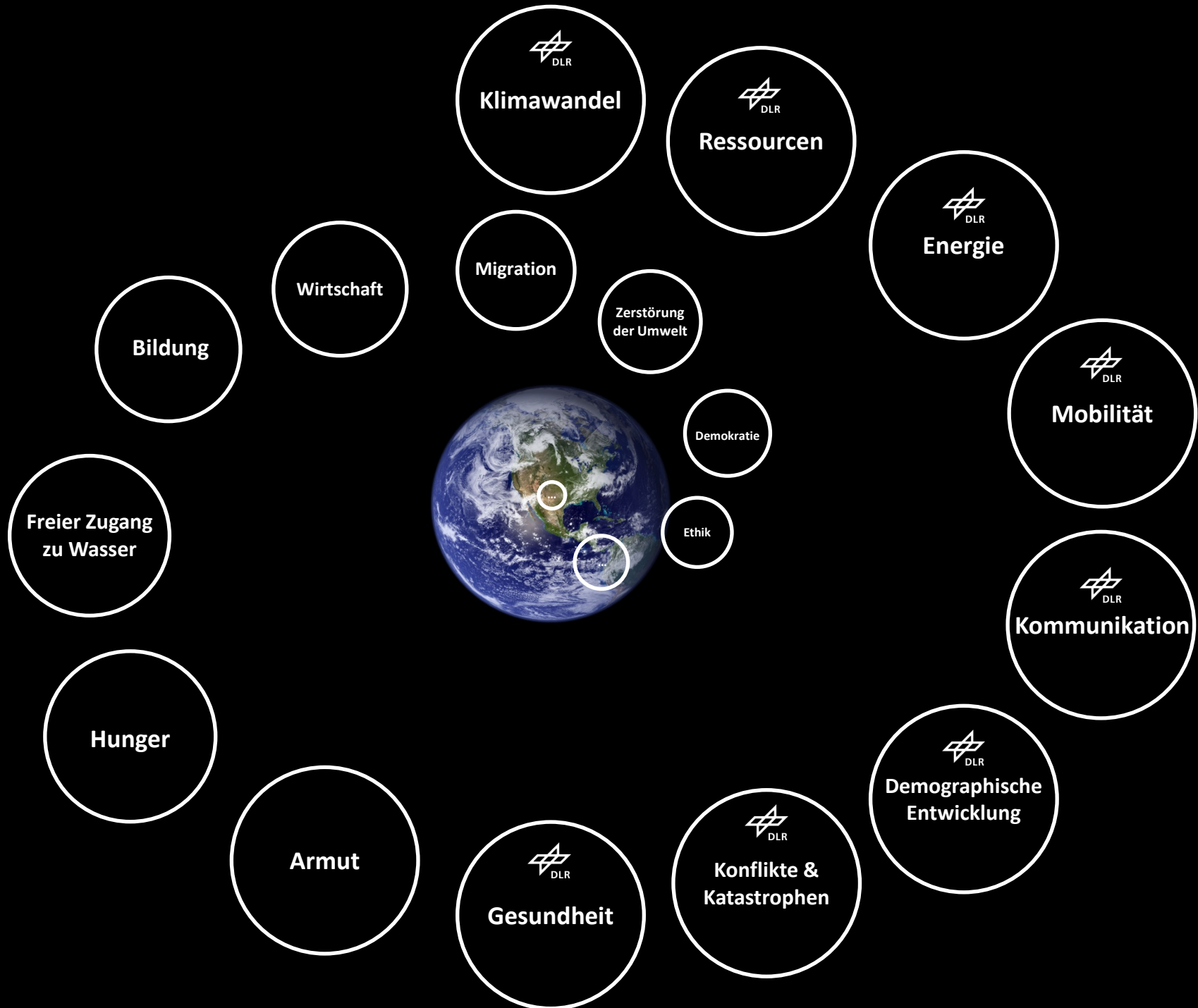
Das Spannungsfeld globaler Herausforderungen

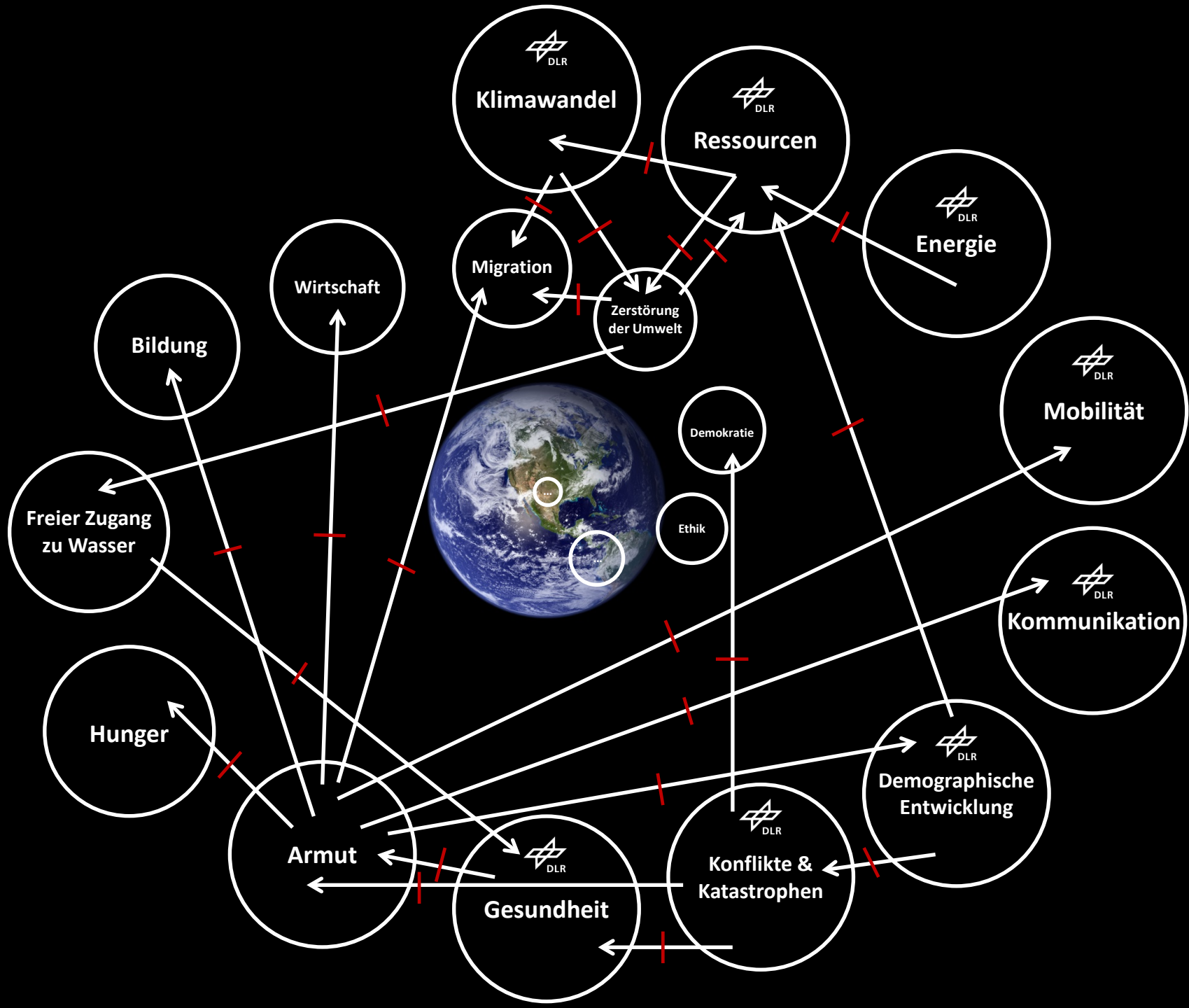


Welches sind die globale Herausforderungen?
Wie ist der Begriff überhaupt definiert?
Wie werden globale Herausforderungen angegangen?



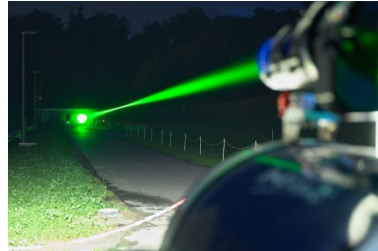




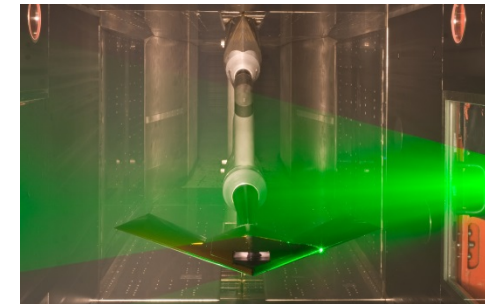




Sicherheitsforschung im DLR - Forschungsinfrastrukturen



- Forschungsflugzeuge
- Unbemannte Luftfahrzeugsysteme (UAS)
- Laser Freistrahlstrecke
- Forschungshafen*
- Empfangsanlagen, Antennen, Bodenstationen
- Windkanäle**
- Simulatoren
- Hochleistungsrechner



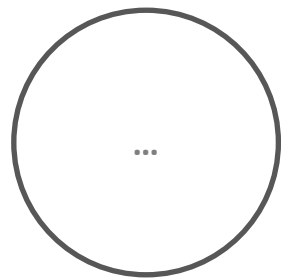
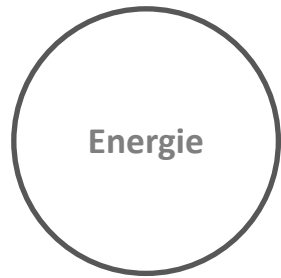
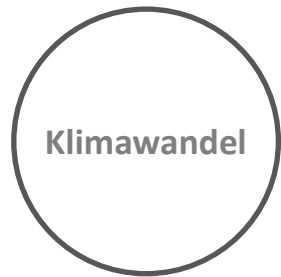
* Gemeinsamer Betrieb mit Uni Rostock und Hochschule Wismar

** Überwiegend innerhalb der Stiftung Deutsch Niederländischer Windkanäle (DNW)



Globale Herausforderungen und Sicherheit

Welchen Ansatz wählen wir? -> Monothematisch & technologisch



Meeresspiegelanstieg

Sturmintensitäten

Dürren

Robuste Infrastrukturen

Terrorabwehr

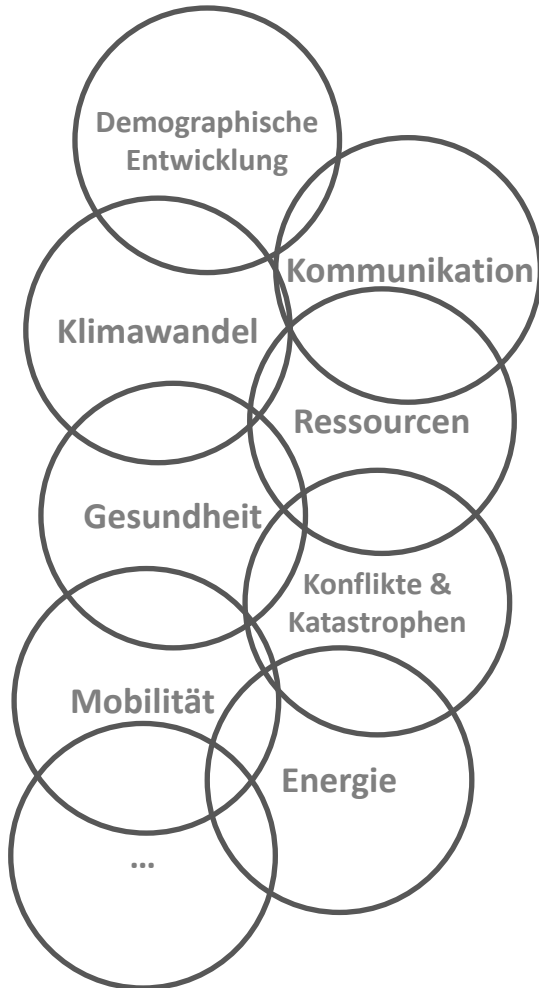
Weltraumwetter





Globale Herausforderungen und Sicherheit

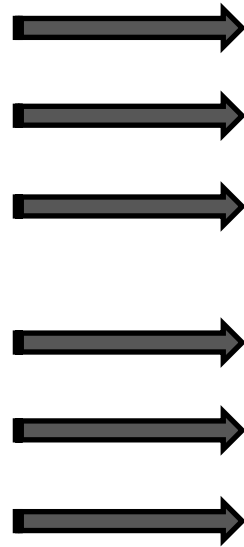
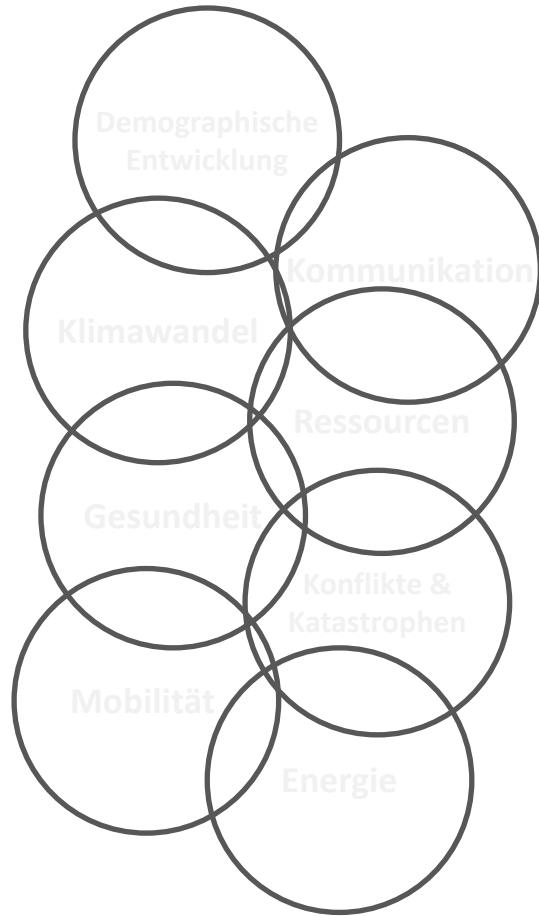
Welchen Ansatz wählen wir? -> Interdisziplinär & holistisch





Globale Herausforderungen und Sicherheit

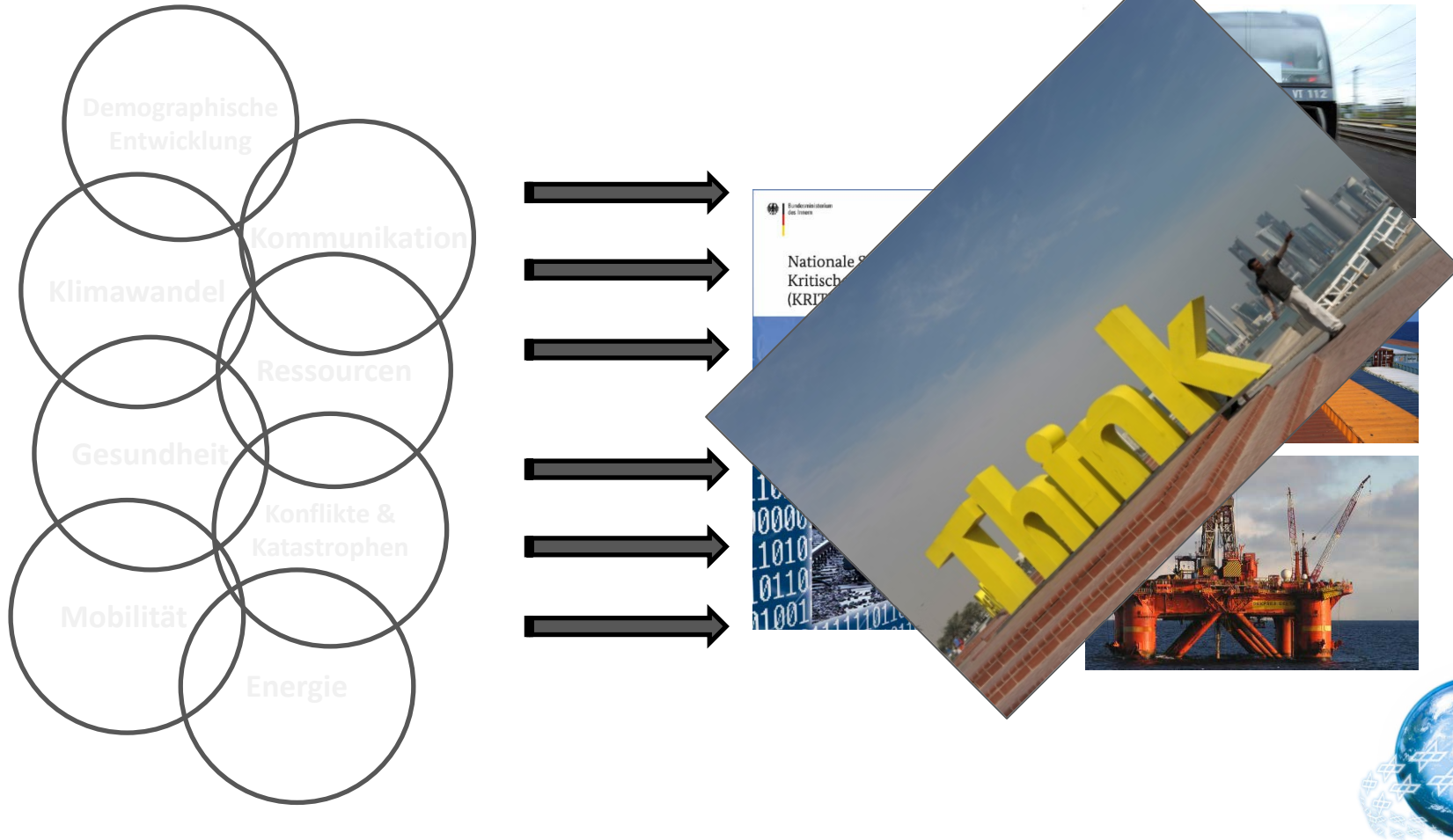
Welchen Ansatz wählen wir? -> Interdisziplinär & holistisch





Globale Herausforderungen und Sicherheit

Welchen Ansatz wählen wir? -> Interdisziplinär & holistisch



Kritische Infrastrukturen – Eine Definition

„Kritische Infrastrukturen (KRITIS) sind Institutionen und Einrichtungen mit wichtiger Bedeutung für das staatliche Gemeinwesen, bei deren Ausfall oder Beeinträchtigung nachhaltig wirkende Versorgungsengpässe, erhebliche Störungen der öffentlichen Sicherheit oder andere dramatische Folgen eintreten würden.“ ...

„Kritische Infrastrukturen sind häufig vernetzt und hängen voneinander ab, welches zu Risiken und Kaskadeneffekten führen kann.“

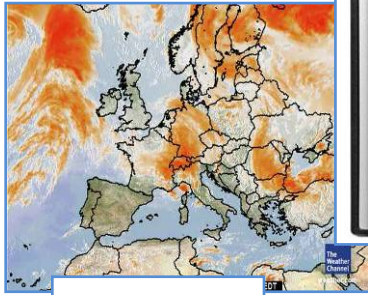
Quelle: Nationale Strategie zum Schutz Kritischer Infrastrukturen (KRITIS-Strategie). Bundesministerium des Innern (BMI), Berlin, 2009

Ziel: Der Schutz kritischer Infrastrukturen



KRITIS Raumfahrt???

Abhängigkeit von der kritischen Infrastruktur Raumfahrt



Wetter



Navigation



Landwirtschaft



Wissenschaft



Logistik



Luftfahrt



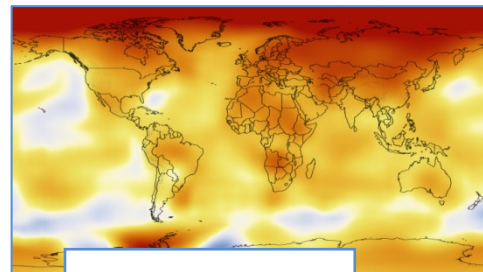
Telekommunikation



Umweltmonitoring



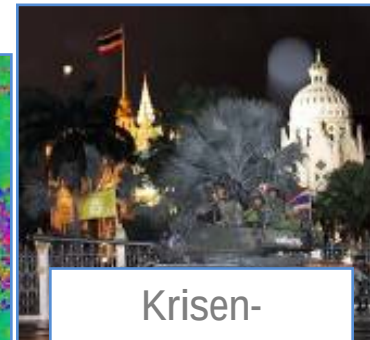
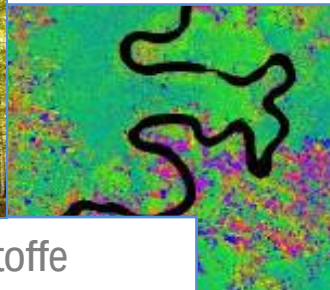
Flüchtlinge



Klimaforschung



Rohstoffe



Krisen-
Früherkennung



Finanzmärkte



Abhängigkeit von der kritischen Infrastruktur Raumfahrt

Natürliche Gefahren

- Festkörper kosmischen Ursprungs (z.B. Meteoriten)
- Hochenergetische Teilchenstrahlung, magnetische Stürme (z.B. Sonnenstürme)

Künstliche Gefahren

- Raumfahrtrückstände wie bspw. ausgediente Satelliten (Weltraummüll)
- Konstruktions-/Entwicklungsfehler

Vorsätzliche Gefahren

- Störung eines Satellitensystems (Jamming)
- Verfälschung von GPS-Signalen (Spoofing)
- Manipulation des Satelliten (Hacking)
- „Killersatelliten“

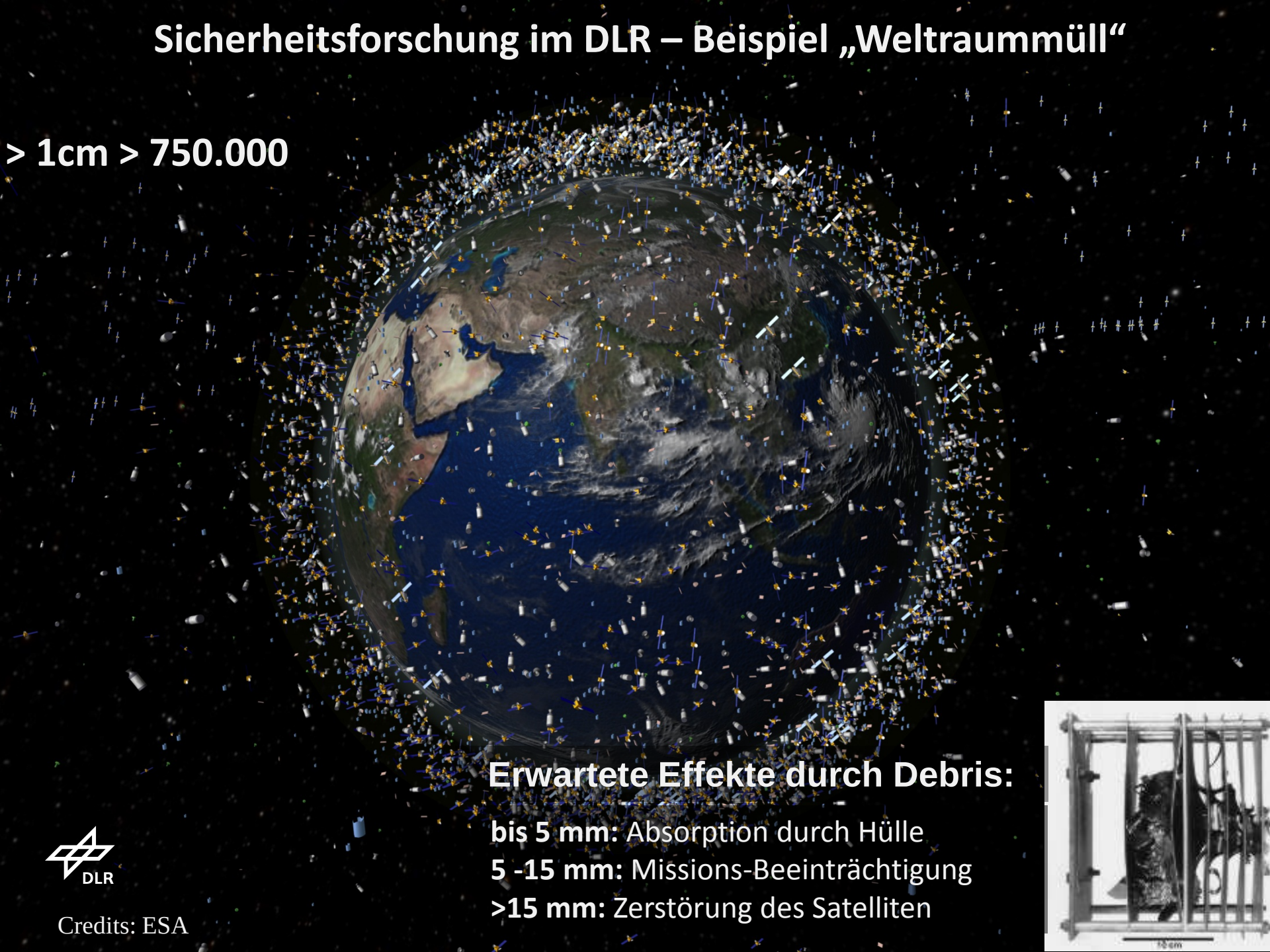


Sicherheitsforschung im DLR – Beispiel „Weltraummüll“

Hier: Video Weltraummüll

Sicherheitsforschung im DLR – Beispiel „Weltraummüll“

> 1cm > 750.000



Erwartete Effekte durch Debris:

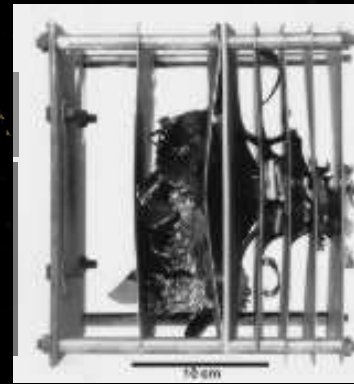
bis 5 mm: Absorption durch Hülle

5 -15 mm: Missions-Beeinträchtigung

>15 mm: Zerstörung des Satelliten

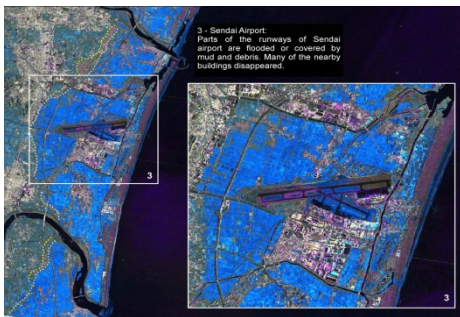


Credits: ESA

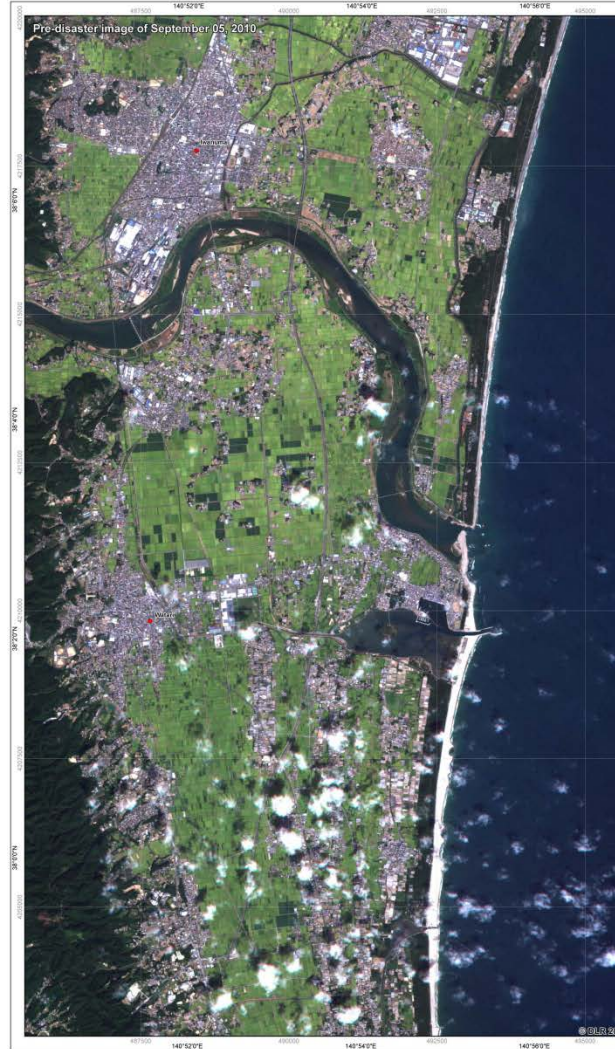




Sicherheitsforschung im DLR – Krisen-/Katastrophenschutz



Erdbeben und Tsunami in Fukushima 2011





Sicherheitsforschung im DLR – Krisen-/Katastrophenschutz



ZKI Service für Bundesbehörden (ZKI-DE)
Analyseprodukte zur Unterstützung des
Notfallmanagements

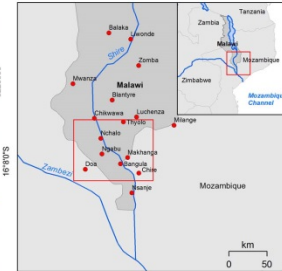
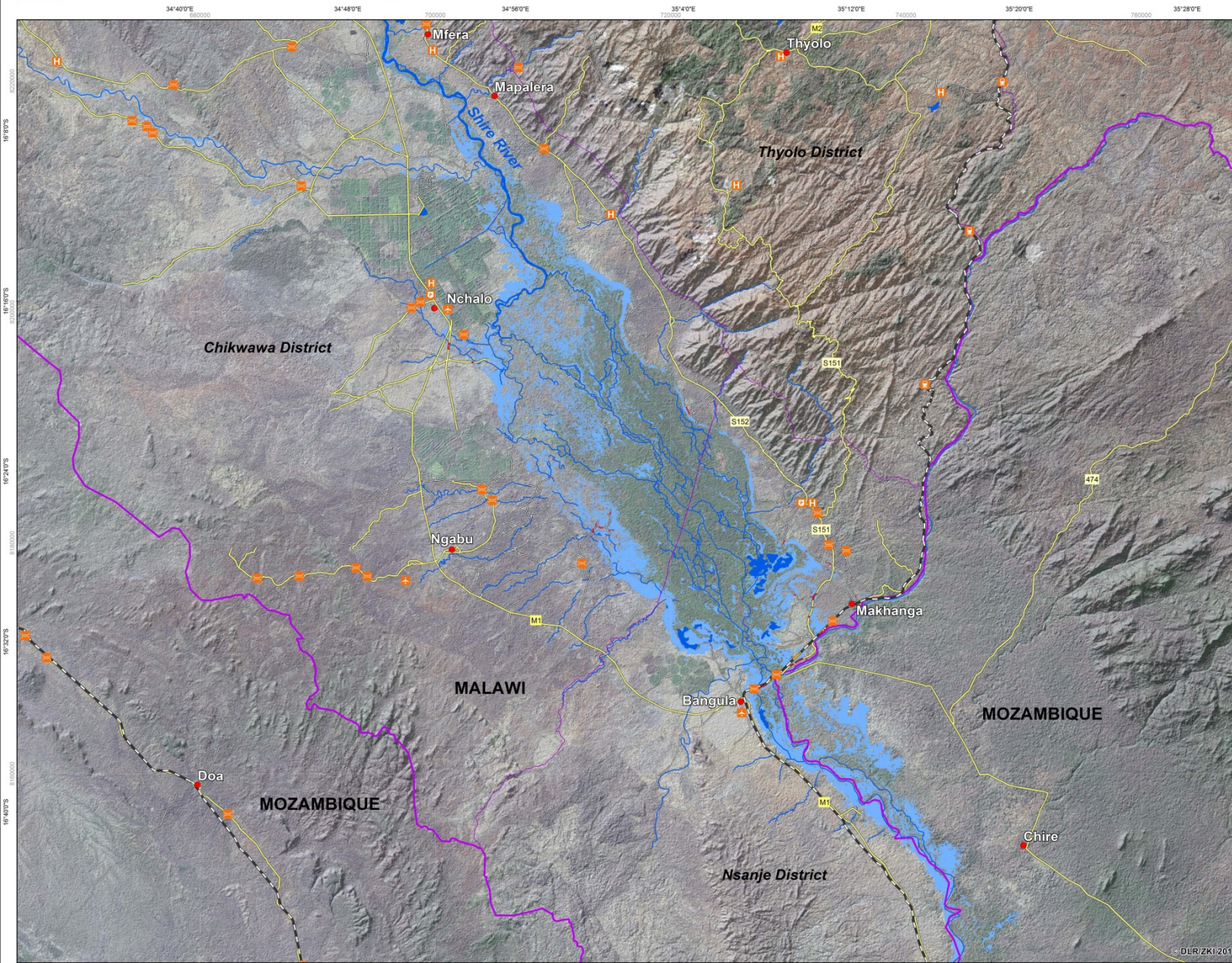


**Bundesministerium
des Innern**



Sicherheitsforschung im DLR – Krisen-/Katastrophenschutz

Hier: Video Überschwemmungen



Legend

- | | |
|--|---------------------------|
| Population | Points of Interest |
| • Town | H Hospital |
| | P Police station |
| Infrastructure | Border |
| — Primary road | — National border |
| — Secondary road | — District border |
| — Railway | |
| + Railway station | |
| + Airport | |
| + Bridge | |
| Flood analysis | |
| — Observed water extent as of January 10, 2015 | |
| — Normal water extent | |
| — Possibly flooded roads | |
| — Possibly flooded railway | |

Interpretation

Wide spread rainfall associated with high rainfall amounts in the catchment areas of Shire and Zambezi river triggered flash floods and flooding in several areas in Southern Malawi and Mozambique.

The map shows the flood situation at the Shire river from the villages of Mapalera (North) to Chire (South). The flood extent was derived by semi-automatic image analysis from TerraSAR-X satellite imagery as of January 10, 2015 (16:00:11 UTC).

LANDSAT-8 satellite imagery acquired on December 13, 2014 and SRTM hillshade are used as backdrop.

Cartographic Information

Local projection: UTM Zone 36S, Datum: WGS 1984
Geographic projection: Lat/Lon (DMS), Datum: WGS 84
Scale: 1:150,000 for A1 prints.

Data Sources

TerraSAR-X (8.25m) © 2015 German Aerospace Center (DLR), 2015 Airbus Defence and Space / Infoterra GmbH
Landsat-8 (30m) © USGS 2015
SRTM C-BAND (30m)
Vector data © 2015 German Aerospace Center
© OpenStreetMap contributors 2015

Framework

The products elaborated for this Rapid Mapping Activity are realised to the best of our ability, within a very short time frame, optimising the material available.

All geographic information has limitations due to the scale, resolution, date and interpretation of the original source materials. No liability concerning the content or the use thereof is assumed by the producer.

The ZKI crisis maps are constantly updated. Please make sure to visit <http://www.zki.dlr.de> for the latest version of this product.

Map produced January 12, 2015 by ZKI
Map updated January 15, 2015
© DLR/ZKI 2015
zki@dlr.de
<http://www.zki.dlr.de>

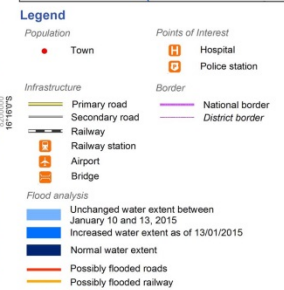
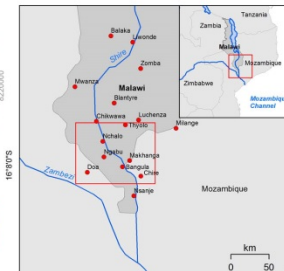
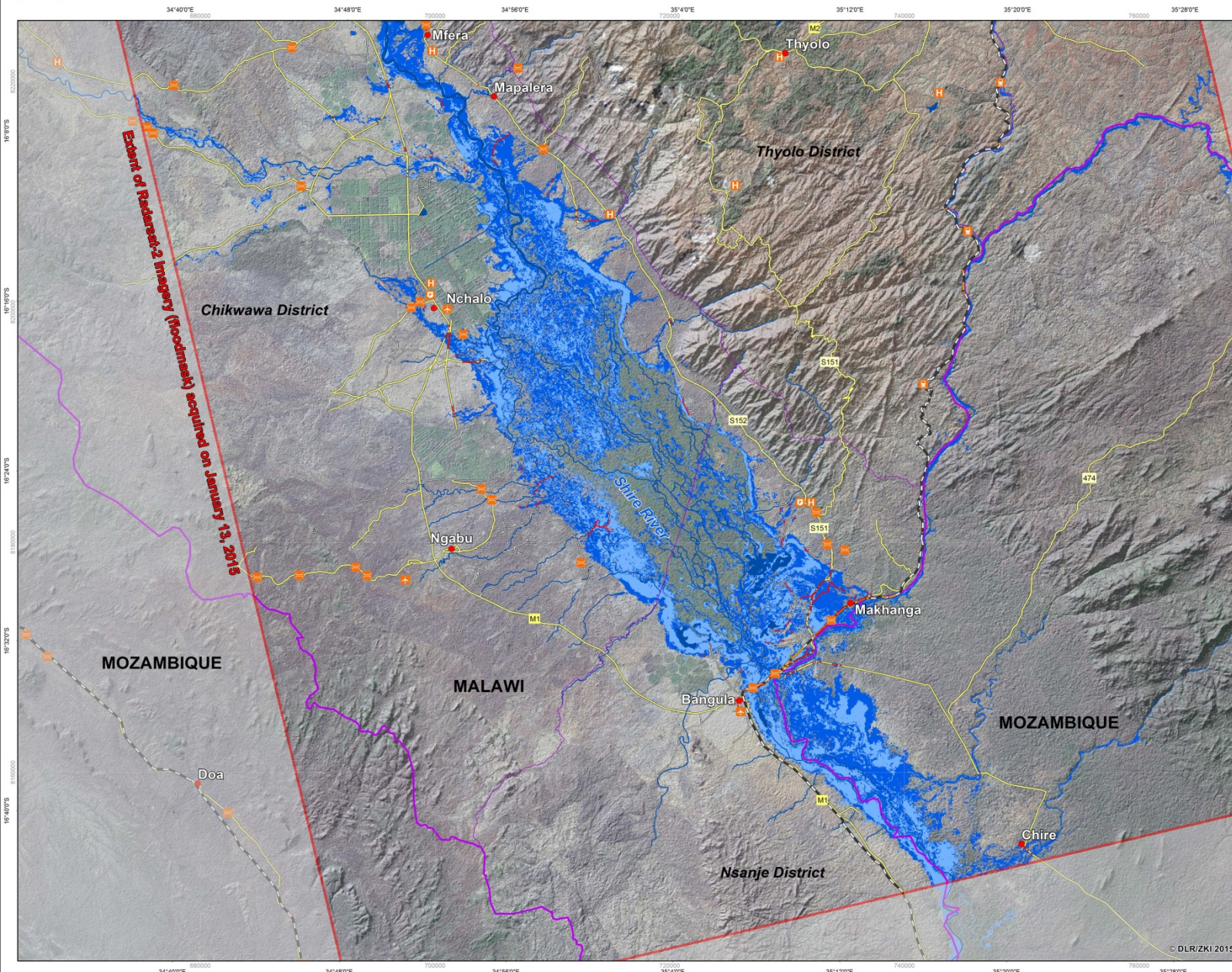


Malawi - Southern Region

Flood situation as of January 10 and 13, 2015 - Monitoring

1:150,000

Charter Call 515
Product No. 02
Version No. 02



Interpretation

Wide spread rainfall associated with high rainfall amounts in the catchment areas of Shire and Zambezi river triggered flash floods and flooding in several areas in Southern Malawi and Mozambique.

The map shows the flood situation at the Shire river from the villages of Mapalera (North) to Chire (South). The flood extents were derived by semi-automatic image analysis from Radarsat-2 satellite imagery as of January 13, 2015 (16:11:29 UTC) and TerraSAR-X satellite imagery as of January 10, 2015 (16:00:11 UTC).

LANDSAT-8 satellite imagery acquired on December 13, 2014 and SRTM hillshade are used as backdrop.

Cartographic Information

Scale: 0 5 10 km

Local projection: UTM Zone 36S, Datum: WGS 1984

Geographic projection: Lat/Lon (DMS), Datum: WGS 84

Scale: 1:150,000 for A1 prints.

Data Sources

TerraSAR-X (8.25m) © 2015 German Aerospace Center (DLR), 2015 Airbus Defence and Space, Infoterra GmbH

RADARSAT-2 (6.25m) © MacDonald, Dettwiler and Associates LTD 2015

Landsat-8 (30m) © USGS 2015

SRTM C-BAND (30m)

Vector data © 2015 German Aerospace Center © OpenStreetMap contributors 2015

Framework

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The ZKI crisis maps are constantly updated. Please make sure to visit <http://www.zki.dlr.de> for the latest version of this product.

Map produced January 14, 2015 by ZKI

Map updated January 15, 2015

© DLR/ZKI 2015

zki@dlr.de

<http://www.zki.dlr.de>



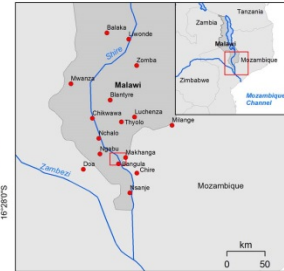
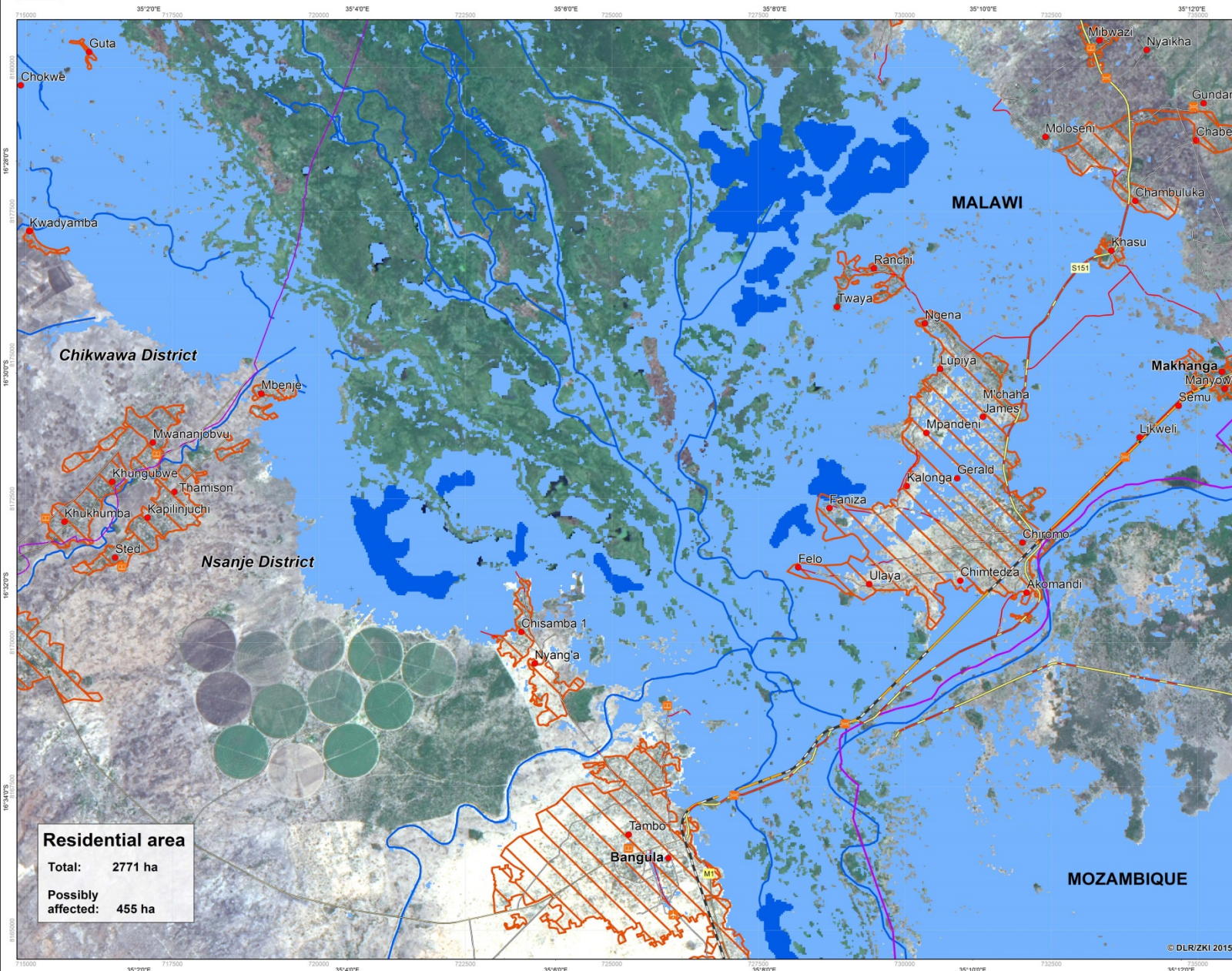


Malawi - Bangula

Flood situation as of January 13, 2015 - Detail Map

1:30,000

Charter Call 515
Product No. 03
Version No. 01



Legend

- | | |
|--|---------------------------|
| Population | Points of Interest |
| • Town / Village | • School |
| ▭ Residential area | |
| Infrastructure | Border |
| — Primary road | — National border |
| — Secondary road | — District border |
| — Local road | |
| — Railway | |
| • Airport | |
| • Bridge | |
| Flood analysis | |
| — Observed water extent as of January 13, 2015 | |
| — Normal water extent | |
| — Possibly flooded roads | |
| — Possibly flooded railway | |

Interpretation

Wide spread rainfall associated with high rainfall amounts in the catchment areas of Shire and Zambezi river triggered flash floods and flooding in several areas in Southern Malawi and Mozambique. The map shows the flood situation at the Shire river in the area of Bangula. The flood extent was derived by semi-automatic image analysis from RADARSAT-2 satellite imagery as of January 13, 2015 (16:11:26 UTC). LANDSAT-8 pansharpened satellite imagery acquired on December 13, 2014 is used as backdrop.

Cartographic Information

Scale: 0 1 2 km
Local projection: UTM Zone 36S, Datum: WGS 1984
Geographic projection: Lat/Lon (DMS), Datum: WGS 84
Scale: 1:30,000 for A1 prints

Data Sources

RADARSAT-2 (6.25m) © MacDonald, Dettwiler and Associates LTD. 2015
LANDSAT-8 (15m) © USGS 2015

Vector data © 2015 German Aerospace Center
© OpenStreetMap contributors 2015

Framework

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Map produced January 15, 2015 by ZKI

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zki@dlr.de
<http://www.zki.de>



Residential area

Total: 2771 ha

Possibly affected: 455 ha

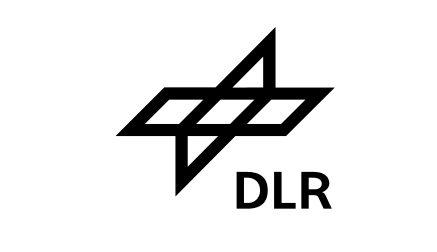
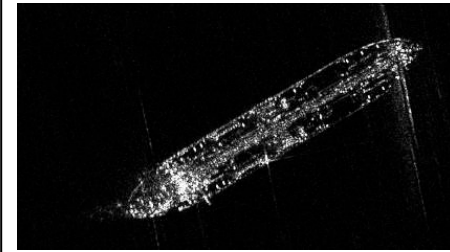
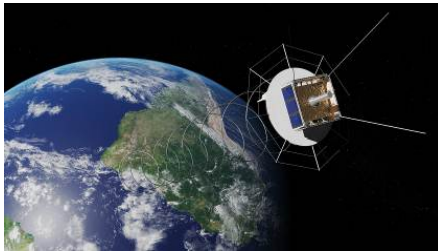
Sicherheitsforschung im DLR – Beispiel Maritime Sicherheit



WV2 acquisition of the Costa Concordia.
(19 Jan 2012)

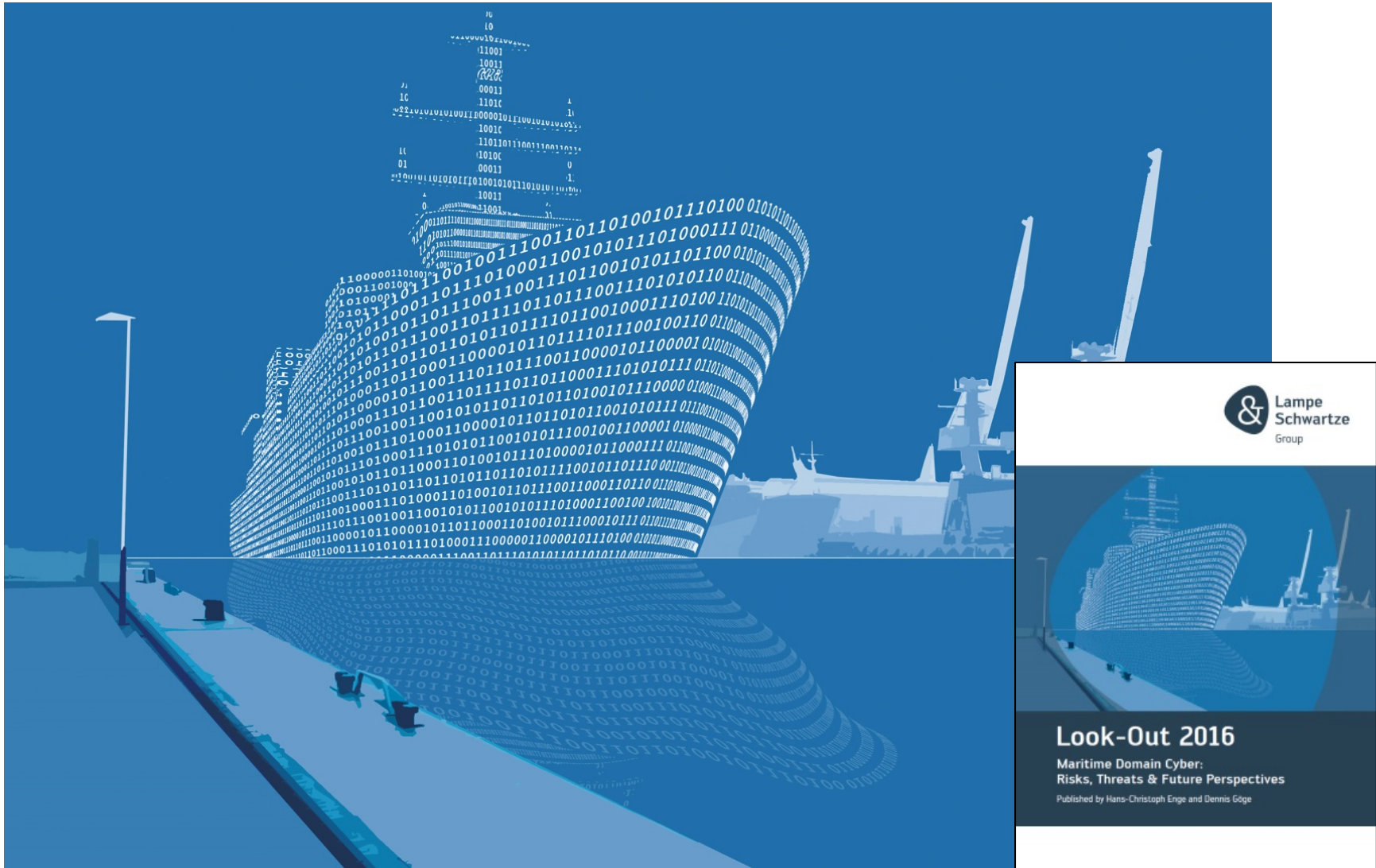
(c) DigitalGlobe, provided by European Space Imaging

Sicherheitsforschung im DLR – Beispiel Maritime Sicherheit





Sicherheitsforschung im DLR – Beispiel Maritime Sicherheit

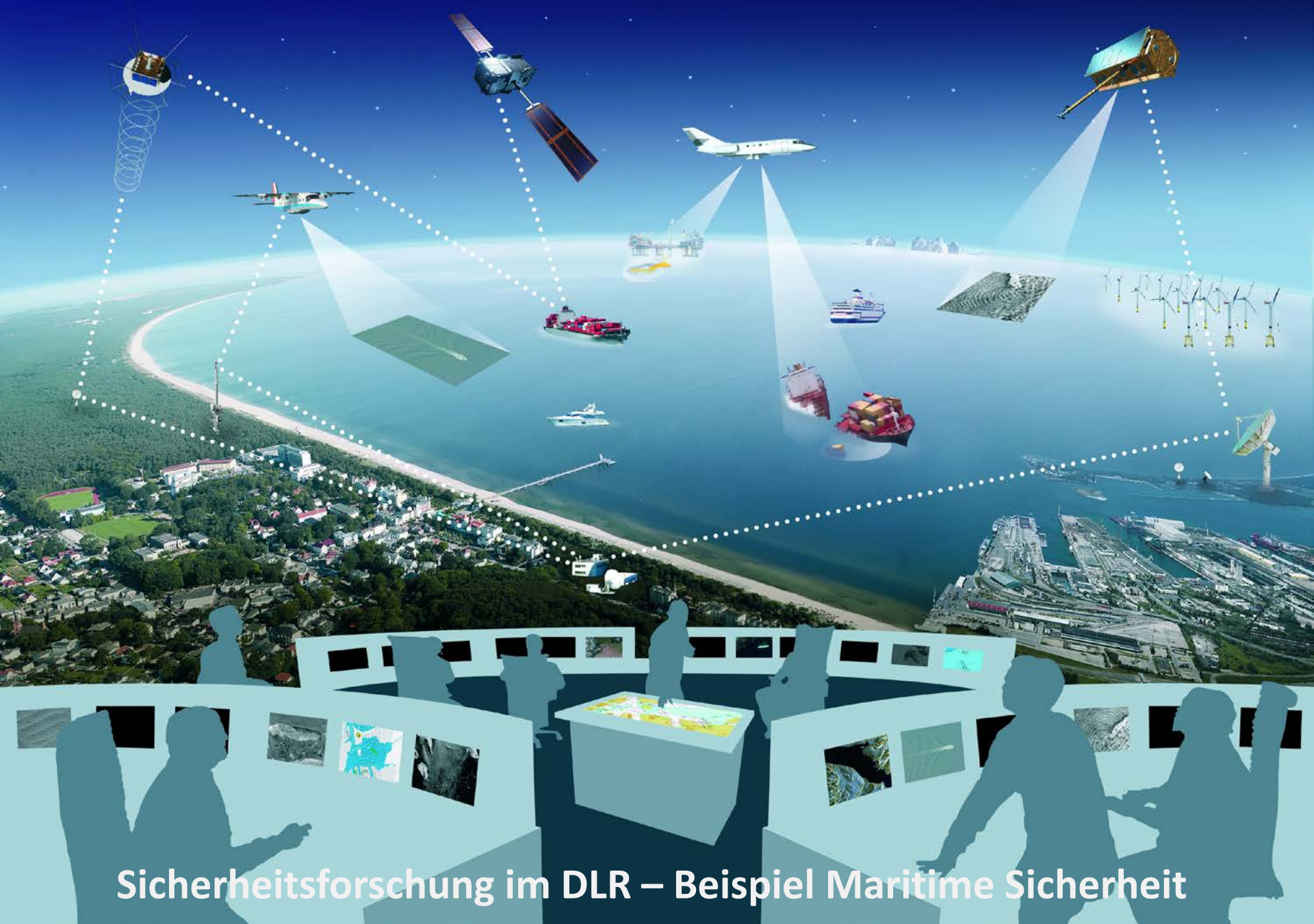


 Lampe
Schwartz
Group

Look-Out 2016

Maritime Domain Cyber:
Risks, Threats & Future Perspectives

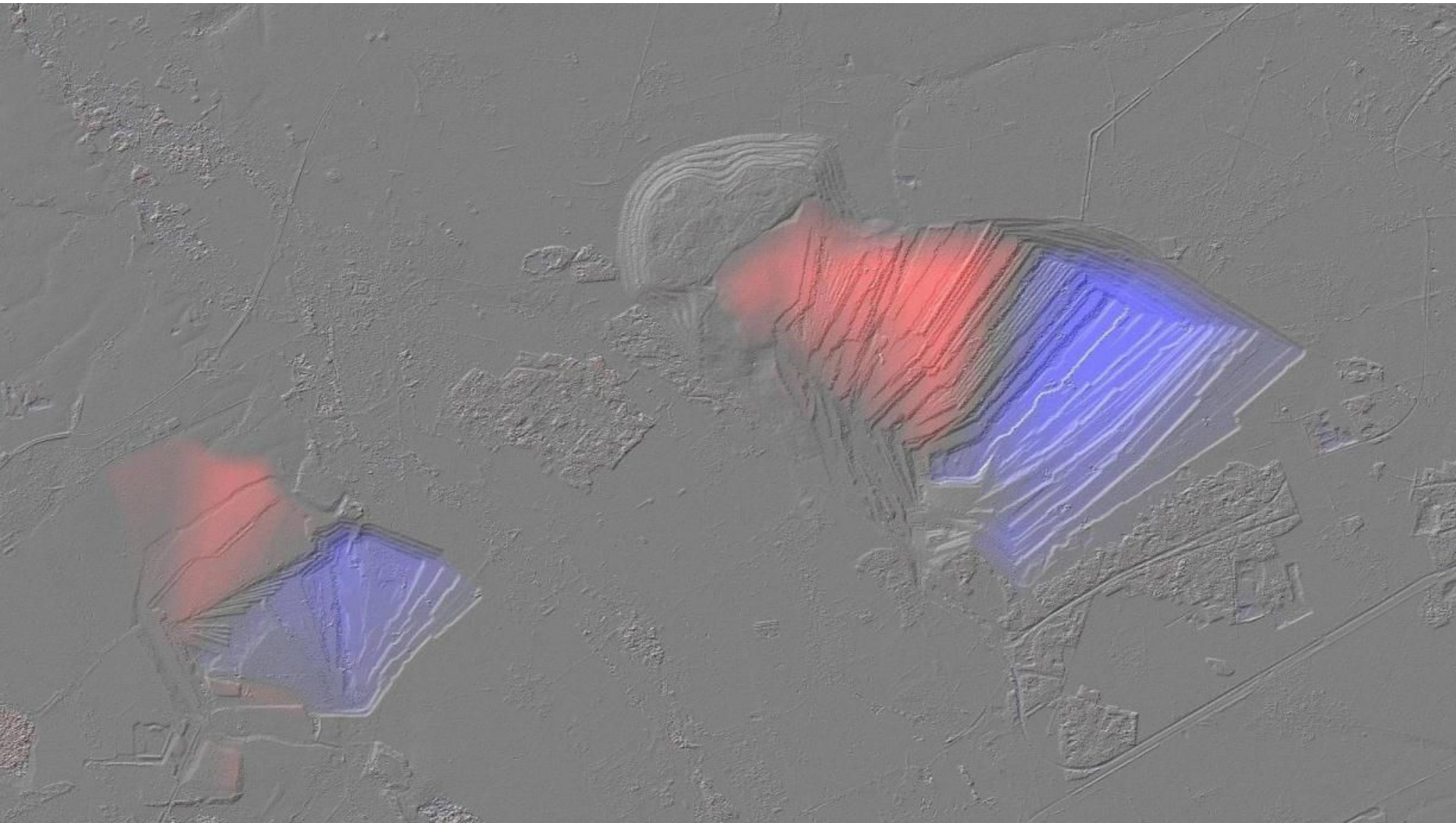
Published by Hans-Christoph Enge and Dennis Göge



Sicherheitsforschung im DLR – Beispiel Maritime Sicherheit

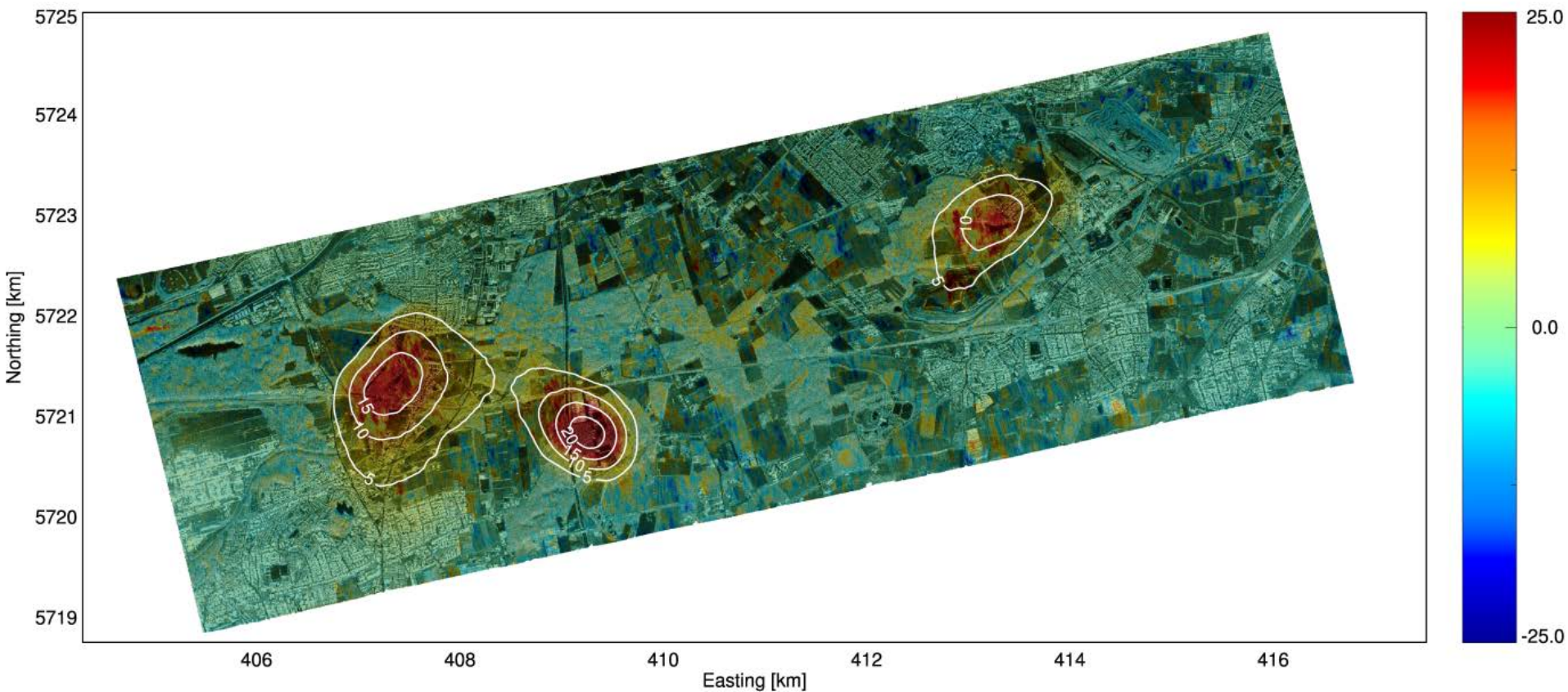


Sicherheitsforschung im DLR – Beispiel Bergbau





Sicherheitsforschung im DLR – Beispiel Bergbau

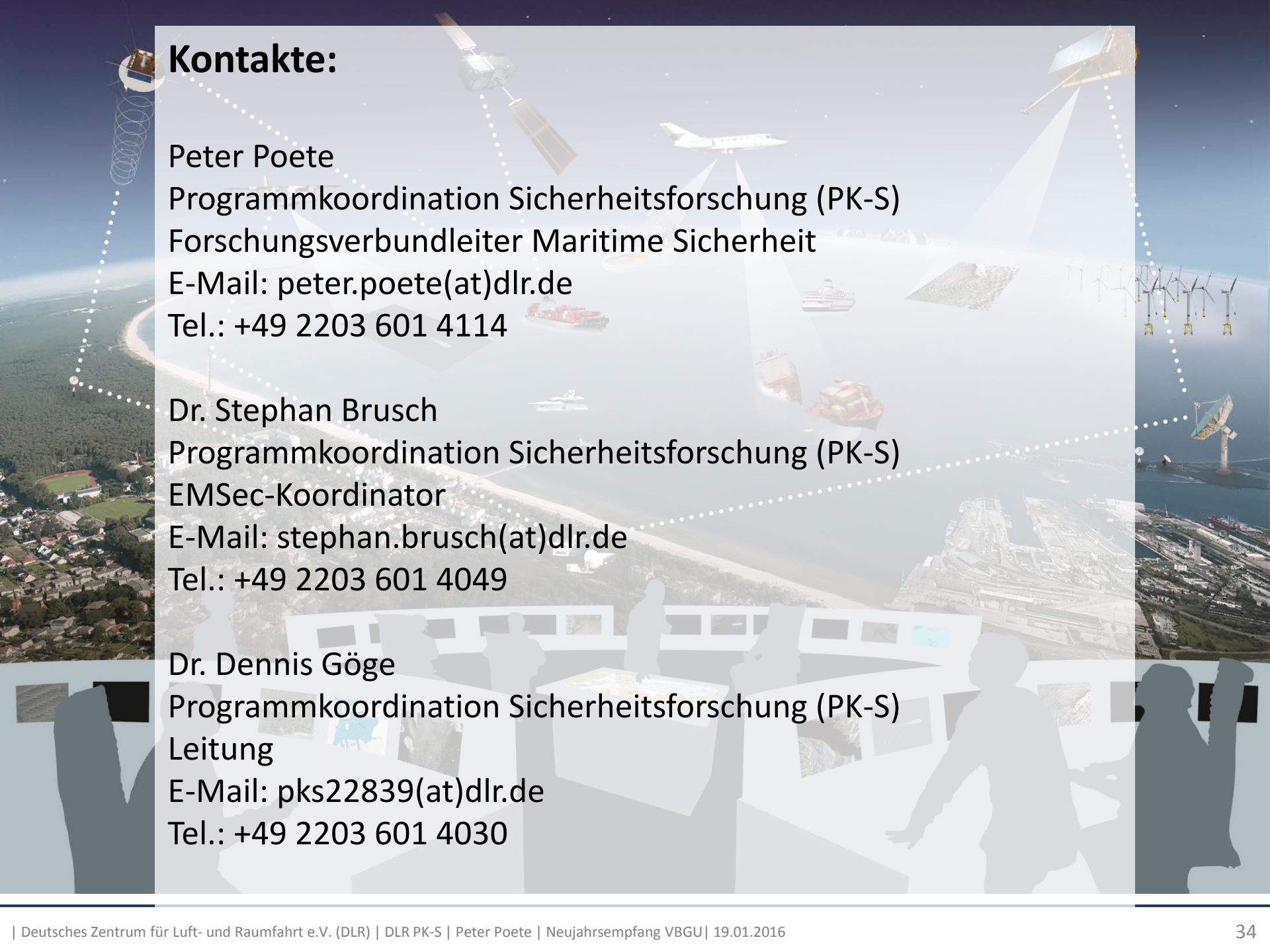




Sicherheitsforschung im DLR – Beispiel Bergbau

Hier: Video Flugroboter in Mine

http://www.dlr.de/dlr/desktopdefault.aspx/tabid-10213/335_read-9527/year-all/335_page-3/#/gallery/13024



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