REMOTE SENSING AND DRONE OBSERVATION TECHNIQUES - TOOL FOR THE CLAIM SETTLEMENT
EUROPA RE CASE STUDY

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Understanding Risk Balkans Conference, 2018 Belgrade Session: Demystifying the Growth Drivers of Catastrophe Insurance Market,
EUROPA RE SHOWCASE OF THE CUTTING EDGE TECHNOLOGIES USE

• EUROPA CLAIM MANAGEMENT
  – Europa RE Claim Solution
  – Elements And Technics of Loss Valuation
  – Serbia flood 2014– Europa RE Experience Gained

• PARAMETRIC FLOOD INSURANCE COVERAGE FOR MUNICIPALITIES:

CLAIM SETTLEMENT
  – Product design
  – Sample zone definition
  – Flood footprint
  – T&C
EUROPA RE CLAIM SOLUTION

CLAIM SERVICES

- Rapid
  - From 3 to 10 days depending on T&C
- Accurate
  - Continuous flood footprint with horizontal accuracy below 1m
  - Earthquake cracks on the walls with accuracy below 1mm
- Transparent
  - All data accessible by Insurance Partners on the web platform

LOSS ASSESSMENT

- Simplified
  - Based on % of flooded zone or magnitude of the earthquake
  - Based on Damage grade as result of damage survey processing
  - Published statistical data of the yields
- Standardized
  - For all products appropriate method of calculation applied
- Embedded in T&C

TOOLS

- IT based data collection, processing, communication & archiving;
- Loss assessment based on local Risk models;
- Use of Remote sensing imagery
  - Satellite
  - Radar
  - Aerial
- Inhouse processing of satellite images.
ELEMENTS AND TECHNICS OF LOSS VALUATION
Aerial and satellite imagery collected and evidence of flood impacted regions provided.

There is no better way to delineate the effects of flooding than through aerial photography.
FIELD SURVEYS BY EUROPA RE LOSS ADJUSTERS

Conducted field surveys by loss adjusters and collected ground based photographs of flood impacted buildings and infrastructure after the flooding subsided;

Team collected:
- photos,
- flood depth,
- GPS coordinates,
- elevation above sea level
  - over four days.
- 311 flood depths geo-located,
- 837 photos
PARAMETRIC FLOOD INSURANCE COVERAGE FOR MUNICIPALITIES: CLAIM SETTLEMENT
PRODUCT DESIGN

- **Objectivity**: Payout based on flood footprint derived from remote sensing data.
  - No direct reference to the physical destruction - no need for building damage assessment.

- **Simplicity**: map area % flooded to payment amount.

- **Transparency**: Europa Re will share remote sensing data with the customer.
SAMPLE ZONE DEFINITION (ČAČAK)
**FLOOD FOOTPRINT: 2014 LAKE PALJUVI**

18.05.2014  
21.05.2014  
23.05.2014  

**Final Flood Footprint:**
FLOOD FOOTPRINT: THE MODEL

- First assessment: optical and radar satellite images.
- Drone supported surveillance if required.
- Daily determination of flood footprint progression.
- The footprint relevant for payout is the union of daily footprints.
# WINGTRA EQUIPMENT

## Operation

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational cruise speed</td>
<td>16 m/s (35.8 mph)</td>
</tr>
<tr>
<td>Wind resistance</td>
<td>up to 45 km/h (12 m/s, 28 mph) in cruise</td>
</tr>
<tr>
<td></td>
<td>up to 30 km/h (8 m/s, 18 mph) for landing</td>
</tr>
<tr>
<td>Maximum flight time</td>
<td>55 minutes</td>
</tr>
<tr>
<td>Min. space for take-off and landing</td>
<td>2 m x 2 m (6.6 ft x 6.6 ft)</td>
</tr>
<tr>
<td>Designed Temperature Range *</td>
<td>-20° C to 50° C (-4° F to 122° F)</td>
</tr>
<tr>
<td>Ground Control Points required</td>
<td>No (with PPK option)</td>
</tr>
</tbody>
</table>

## Results

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coverage at 120m (400ft) **</td>
<td>320 Ha (790 ac)</td>
</tr>
<tr>
<td>Max. coverage ***</td>
<td>45 km² (17 mi²)</td>
</tr>
<tr>
<td>Minimal ground sampling distance ****</td>
<td>Down to 0.7 cm / pixel (0.3 inch/pixel)</td>
</tr>
<tr>
<td>Mapping accuracy with PPK (w/o GCPs)</td>
<td>Absolute accuracy (RMS):</td>
</tr>
<tr>
<td></td>
<td>horizontal down to 1 cm (0.4 in)</td>
</tr>
<tr>
<td></td>
<td>vertical down to 2 cm (0.8 in)</td>
</tr>
<tr>
<td></td>
<td>Relative accuracy:</td>
</tr>
<tr>
<td></td>
<td>down to 0.003 % (horizontal)</td>
</tr>
</tbody>
</table>
# Sample Tariff

<table>
<thead>
<tr>
<th>Zone name</th>
<th>% Flooded Area of the Zone</th>
<th>Pay-out in EUR</th>
</tr>
</thead>
<tbody>
<tr>
<td>North</td>
<td>&lt; 5%</td>
<td>0</td>
</tr>
<tr>
<td>North</td>
<td>5% to 25%</td>
<td>30,000</td>
</tr>
<tr>
<td>North</td>
<td>25% to 35%</td>
<td>40,000</td>
</tr>
<tr>
<td>North</td>
<td>35% to 45%</td>
<td>100,000</td>
</tr>
<tr>
<td>North</td>
<td>45% to 55%</td>
<td>300,000</td>
</tr>
<tr>
<td>North</td>
<td>55% to 65%</td>
<td>750,000</td>
</tr>
<tr>
<td>North</td>
<td>&gt; 65%</td>
<td>900,000</td>
</tr>
<tr>
<td>South</td>
<td>&lt; 5%</td>
<td>0</td>
</tr>
<tr>
<td>South</td>
<td>5% to 25%</td>
<td>40,000</td>
</tr>
<tr>
<td>South</td>
<td>25% to 35%</td>
<td>50,000</td>
</tr>
<tr>
<td>South</td>
<td>35% to 45%</td>
<td>60,000</td>
</tr>
<tr>
<td>South</td>
<td>45% to 55%</td>
<td>90,000</td>
</tr>
<tr>
<td>South</td>
<td>55% to 65%</td>
<td>110,000</td>
</tr>
<tr>
<td>South</td>
<td>65% to 75%</td>
<td>200,000</td>
</tr>
<tr>
<td>South</td>
<td>&gt; 75%</td>
<td>400,000</td>
</tr>
<tr>
<td>Valley</td>
<td>&lt; 5%</td>
<td>0</td>
</tr>
<tr>
<td>Valley</td>
<td>5% to 25%</td>
<td>175,000</td>
</tr>
<tr>
<td>Valley</td>
<td>25% to 35%</td>
<td>300,000</td>
</tr>
<tr>
<td>Valley</td>
<td>35% to 45%</td>
<td>500,000</td>
</tr>
<tr>
<td>Valley</td>
<td>45% to 55%</td>
<td>800,000</td>
</tr>
<tr>
<td>Valley</td>
<td>55% to 65%</td>
<td>950,000</td>
</tr>
<tr>
<td>Valley</td>
<td>65% to 75%</td>
<td>3,000,000</td>
</tr>
<tr>
<td>Valley</td>
<td>&gt; 75%</td>
<td>7,000,000</td>
</tr>
</tbody>
</table>
PAY-OUT SETTLEMENT

- Sample result of the remote sensing:

<table>
<thead>
<tr>
<th>Zone name</th>
<th>% flooded in the sample case</th>
</tr>
</thead>
<tbody>
<tr>
<td>North</td>
<td>24%</td>
</tr>
<tr>
<td>South</td>
<td>2%</td>
</tr>
<tr>
<td>Valley</td>
<td>33%</td>
</tr>
</tbody>
</table>

- Payment calculation:

<table>
<thead>
<tr>
<th>Zone</th>
<th>Pay-out in the sample case in EUR</th>
</tr>
</thead>
<tbody>
<tr>
<td>North</td>
<td>30.000</td>
</tr>
<tr>
<td>South</td>
<td>0</td>
</tr>
<tr>
<td>Valley</td>
<td>300.000</td>
</tr>
<tr>
<td>Total</td>
<td>330.000</td>
</tr>
</tbody>
</table>
AUTOMATICALLY TRIGGERED CLAIM SETTLEMENT

- **EUROPA RE** is responsible for:
  - Event proclamation.
  - Remote sensing.
  - Verifiable flood footprint determination.
  - Pay-out calculation.

- **Customer benefits:**
  - No need to file a claim.
  - Fast payment.
  - Ability to check the flood footprint calculation based on shared remote sensing data.
CAT MONITOR
FOR SOUTH-EAST EUROPA
AND KAZAKHSTAN

EUROPA Re Ltd.

Albania  Macedonia  Serbia  Kazakhstan
CUSTOMER INFORMATION PORTAL

- **Covered countries**
  - Albania.
  - Macedonia.
  - Serbia.
  - Kazakhstan.

- **Functions:**
  - Individual risk scoring for residential buildings.
  - Earthquake and Flood event information.
  - Historical hazard maps.
  - Alerts and news feeds.
  - Crowd reporting.
Risk Rating: Moderately High

Risk Scale: 1 = Low, 2 = Moderate, 3 = Moderately High, 4 = High, 5 = Very High

Medium Hazard and Medium risk: your property is located in an area of medium seismic hazard. Earthquakes have occurred in your area and the chance that your property will experience a ground shaking of significant intensity in its foreseeable life is sizable. If an earthquake of magnitude 5 or larger were to occur in your area, but not in the immediate proximity of the site, your building is expected to suffer moderate to major damage. A more severe level of damage could happen if such an earthquake were to occur in the immediate proximity of your site or if your building is located on soft soil. In this case your building may not be usable possibly for an extended period of time after the event. The adoption of earthquake risk mitigation strategies, including structural retrofitting and earthquake insurance, should be considered.

We advise you to buy an earthquake insurance policy that would cover such severe damages or collapse of the building. To ensure a swift and proper settlement of your insurance claim in the aftermath of catastrophic events we recommend insurance products designed and reinsured by Europa Re - a Swiss reinsurance company, owned by governments of Albania, Macedonia and Serbia, and established with the assistance from the World Bank, Swiss Government, the European Union and the United Nations. Europa Re endorsed insurance products can be obtained only from those insurance companies that have been certified to participate in Europa Re program. These are as follows:

CROATIA®

КРОАЦИЈА ОСИГУРУВАЊЕ –
HISTORICAL EVENT (1963 SKOPJE EARTHQUAKE)
RISK MAP (1000Y MRP FLOOD)
EVENT ALERT AND NEWS FEED

Legend
- Flood
- Earthquake M < 3.5
- Earthquake M ≥ 3.5
- Earthquake M ≥ 4
- Earthquake M ≥ 5

Disaster Alerts
- ML 4.2 ADRIATIC SEA
  2018-09-15 03:18:00
  Source: EMSC Earthquakes
- ML 3.5 DODECANESI
  ISLANDS, GREECE
  2018-09-15 02:16:00
  Source: EMSC Earthquakes
- M 4.6 KYRGYZSTAN
  2018-09-14 22:23:00
  Source: EMSC Earthquakes

- Flood
  - 7 days
  - 30 days
  - 3 months
  - 6 months
  - 1 year

- Earthquake
  - 7 days
  - 30 days
  - 3 months
  - 6 months
  - 1 year

Minimum earthquake magnitude: 3.0
THANK YOU FOR YOUR ATTENTION!

Contact:
claims@europa-re.com