**AIENS**
- Identification of most critical volcanoes in Iceland
- Definition of eruption scenarios
- Identification of eruption source parameters
- Hazard assessment for multiple sources
- Hazard assessment at multiple scales
- Definition of vulnerability indicators at multiple scales
- Identification of critical protection of infrastructures
- Impact: risk assessment at multiple scales

**METHODS**
- Understanding of eruption history from field and literature studies
- Use of stochastic sampling to infer missing parts of the geological record
- Production and hazard assessment
- Combination of the ERS and LLERS models for assessment at national and continental scales (Fig. 1)
- Realizing GP-IS database at multiple scales
- Risk assessment overlaying hazard and vulnerability layers

**GENERATION OF PROBABILITY DENSITY FUNCTIONS FOR EROSION SOURCE PARAMETERS**

**ERUPTION SCENARIOS**

<table>
<thead>
<tr>
<th>Volcano</th>
<th>Type</th>
<th>VEI</th>
<th>Duration</th>
<th>MER (kg)</th>
<th>Tephra Mass (kg)</th>
<th>Gas Emissions (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hekla</td>
<td>ERS</td>
<td>4</td>
<td>1 day</td>
<td>6.9x10^9</td>
<td>6.9x10^11</td>
<td>6.9x10^10</td>
</tr>
<tr>
<td>Katla</td>
<td>ERS</td>
<td>4</td>
<td>1 day</td>
<td>6.9x10^9</td>
<td>6.9x10^11</td>
<td>6.9x10^10</td>
</tr>
</tbody>
</table>

**PROBABILITY MAPS - GROUND ACCUMULATION > 10 KG/M^2**

**WORST-CASE SCENARIOS**

**VULNERABILITY ASSESSMENT**

**QUALITATIVE RISK ASSESSMENT IMPACTS ON FIR**

**QUANTITATIVE IMPACT ASSESSMENT**

**CONCLUSIONS**
- Eruption scenarios and eruption must be defined by probabilistic strategies based on strong field constraints.
- Moderate long-lasting and intense short-lasting eruptions produce different hazard and risk patterns, due to varying in the VEI.
- All included risks, main reasons related to ground accretion of tephra concern electrical power lines and agricultural activities (i.e. accumulations of 10^5 kg).
- By applying the probabilistic approach, Katla is by far the most critical volcano, making critical concentrations overwhelming over the entire scenario.
- Qualitative risk assessment allow for rapid identification and comparison of critical zones, quantitative impacts assessments allow for cost estimations.