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The European Commission's Joint Research Centre, United Nations and the World Bank issue a comprehensive building damage atlas for Haiti

A comprehensive atlas of all damage caused in Haiti by the magnitude 7.0 earthquake on 12 January 2010 is now available to help planning recovery and reconstruction measures. The atlas, based on the comparison between pre-disaster satellite imagery and post-disaster aerial photos, provides an overview of building damage in the main affected cities in Haiti showing that almost 60,000 buildings, ten times more than initially estimated, were either destroyed or very heavily damaged.

The Haiti building damage atlas was produced by the United Nations' Institute for Training and Research (UNITAR)/Operational Satellite Applications Programme (UNOSAT), the European Commission's Joint Research Centre (JRC), and the World Bank in support to the Post Disaster Needs Assessment (PDNA) process led by the Government of Haiti.

The atlas provides a homogenous evidence base for the identification of recovery needs and the mobilisation of resources to finance the recovery and reconstruction.

For each main city a separate atlas is produced, including an overview map of the atlas sheets, as well as individual sheets at a scale of 1:2,500 for A3 size hardcopy printouts. The damage to individual buildings is categorised according to the European Macroseismic Scale (EMS-98) five-level grading system, which includes a substantial to heavy damage state (Level 3), very heavy damage state (Level 4), and destruction damage state (Level 5).

Almost 60,000 buildings were found to be either completely destroyed or very heavily damaged in the densely populated parts of the eleven communes assessed. Residential buildings and buildings in slums bore the worst damage, particularly in Port-Au-Prince, Carrefour, Delmas and Leogane communes.

The atlas and the detailed damage assessments are the result of comparison and manual photo-interpretation of pre-earthquake satellite imagery (circa 50 cm spatial resolution) and post-earthquake aerial photos (circa 15 cm spatial resolution). In addition to the imagery analysis, UNOSAT, JRC and the World Bank have carried out in-field missions in cooperation with Haiti's Centre National d'Information Geo-Spatiale (CNIGS).

The damage is now assessed to be ten times higher than first estimates given immediately after the event, which can be attributed to the availability of better resolution aerial data.

Background information

The atlas and the detailed damage assessments are the result of the three main operational remote sensing damage assessments carried out following the earthquake on 12 January by

image analysts at UNITAR/UNOSAT, assisted by Swisstopo of Switzerland and the Remote Sensing Laboratories (RSL) of the University of Zurich, the JRC and the World Bank. Aerial photos were provided by the World Bank (World Bank-ImageCat-RIT Remote Sensing Mission), Google and the National Oceanic and Atmospheric Administration (NOAA); satellite imagery was derived from the GeoEye and Digitalglobe satellites.

UNITAR/UNOSAT received funding support from the United Nations Development Programme (UNDP), the JRC received funding from the European Union Instrument for Stability, and The World Bank received funding through the Global Facility for Disaster Reduction and Recovery (GFDRR).

The PDNA Atlas series is available for download at:

http://www.unosat.org/asp/prod_free.asp?id=52

Figure 1: Number of damaged houses grouped in the five European Macroseismic Scale (EMS-98).

Damage classes per Commune and dominant land use class. Classes 4 and 5 have been classified after visual inspection of pre and post event remotely sensed data, while classes 1-3 were calculated using the damage model developed by Cambridge Architectural Research Ltd.

| Commune | EMS-98 Damage Classes | | | | |
|--------------------------|-----------------------|------------------------|----------------------------------|----------------------|----------------------------------|
| | 5 Destruction | 4 Very heavy damage | 3 Substantial to heavy damage | 2 Moderate damage | 1 Negligible to slight damage |
| CARREFOUR | 2763 | 5905 | 5920 | 3220 | 35219 |
| Commercial | 250 | 355 | 249 | 261 | 71 |
| Industrial | 47 | 45 | 38 | 40 | 11 |
| Residential high density | 194 | 378 | 331 | 211 | 1867 |
| Residential low density | 1921 | 4151 | 4771 | 2602 | 29926 |
| Shanty | 351 | 976 | 531 | 106 | 3344 |
| CITE SOLEIL | 1012 | 549 | 1073 | 576 | 6403 |
| Agricultural | 3 | 0 | | | |
| Industrial | 89 | 44 | 55 | 57 | 16 |
| Residential low density | 745 | 416 | 912 | 498 | 5722 |
| Shanty | 175 | 89 | 106 | 21 | 665 |
| DELMAS | 5012 | 2814 | 5064 | 2881 | 29478 |
| Commercial | 82 | 54 | 56 | 59 | 16 |
| Industrial | 291 | 130 | 173 | 182 | 50 |
| Residential high density | 1662 | 848 | 1453 | 925 | 8191 |
| Residential low density | 2251 | 1581 | 3011 | 1642 | 18886 |
| Shanty | 726 | 201 | 371 | 74 | 2336 |
| GRAND-GOAVE | 148 | 541 | 421 | 276 | 2175 |
| Commercial | 8 | 33 | 17 | 18 | 5 |

| Commune | EMS-98 Damage Classes | | | | |
|-----------------------------|-----------------------|---------------------------|-------------------------------------|-------------------------|-------------------------------------|
| | 5 Destruction | 4 Very heavy damage | 3 Substantial to heavy damage | 2 Moderate damage | 1 Negligible to slight damage |
| Industrial | 19 | 82 | 42 | 44 | 12 |
| Residential high density | 60 | 263 | 187 | 119 | 1054 |
| Residential low density | 61 | 163 | 176 | 96 | 1104 |
| GRESSIER | 565 | 289 | 567 | 319 | 3436 |
| Agricultural | 78 | 30 | | | |
| Commercial | 26 | 22 | 20 | 21 | 6 |
| Industrial | 0 | 0 | 0 | 0 | 0 |
| Openland | 1 | 1 | | | |
| Residential low density | 460 | 236 | 547 | 298 | 3430 |
| Shanty | 0 | 0 | 0 | 0 | 0 |
| JACMEL | 214 | 1785 | 1489 | 857 | 8799 |
| Commercial | 22 | 153 | 72 | 75 | 21 |
| Industrial | 4 | 40 | 18 | 19 | 5 |
| Residential low density | 188 | 1592 | 1399 | 763 | 8773 |
| LEOGANE | 2220 | 5985 | 4139 | 2360 | 24736 |
| Agricultural | 726 | 1975 | | | |
| Commercial | 132 | 348 | 198 | 207 | 56 |
| Industrial | 4 | 13 | 7 | 7 | 2 |
| Residential low density | 1358 | 3649 | 3934 | 2146 | 24677 |
| PETION-VILLE | 2027 | 906 | 1693 | 708 | 10614 |
| Agricultural | 0 | 0 | | | |
| Commercial | 10 | 0 | 4 | 4 | 1 |
| Industrial | 0 | 0 | 0 | 0 | 0 |
| Residential low density | 938 | 410 | 1059 | 578 | 6644 |
| Shanty | 1079 | 496 | 630 | 126 | 3969 |
| PETIT-GOAVE | 173 | 104 | 167 | 116 | 770 |
| Commercial | 78 | 24 | 42 | 44 | 12 |
| Industrial | 1 | 1 | 1 | 1 | 0 |
| Residential high density | 32 | 25 | 33 | 21 | 186 |
| Residential low density | 62 | 54 | 91 | 50 | 572 |
| PORT-AU-PRINCE | 9902 | 15257 | 12351 | 6699 | 62693 |
| Commercial | 1548 | 2269 | 1572 | 1647 | 449 |
| Downtown | 451 | 487 | 386 | 405 | 110 |
| Industrial | 53 | 127 | 74 | 78 | 21 |



| Commune | EMS-98 Damage Classes | | | | |
|--|-----------------------|------------------------|----------------------------------|----------------------|----------------------------------|
| | 5 Destruction | 4 Very heavy damage | 3 Substantial to heavy damage | 2 Moderate damage | 1 Negligible to slight damage |
| Residential high density | 3031 | 4370 | 4285 | 2727 | 24151 |
| Residential low density | 960 | 1385 | 1843 | 1005 | 11558 |
| Shanty | 3859 | 6619 | 4191 | 838 | 26405 |
| TABARRE | 532 | 365 | 663 | 383 | 3914 |
| Agricultural | 0 | 2 | | | |
| Industrial | 47 | 53 | 41 | 43 | 12 |
| Openland | 3 | 0 | | | |
| Residential high density | 1 | 0 | 1 | 0 | 3 |
| Residential low density | 481 | 310 | 622 | 339 | 3899 |
| Total | 24062 | 34500 | 33546 | 18395 | 188236 |
| Nb. of destroyed and very heavily damaged buildings | 58562 | | | | |

Figure 2: The Haiti Building Damage Atlas cover page shows the sheet lines of the Atlas for Port-au-Prince and single map ID's on top of the identified damages.

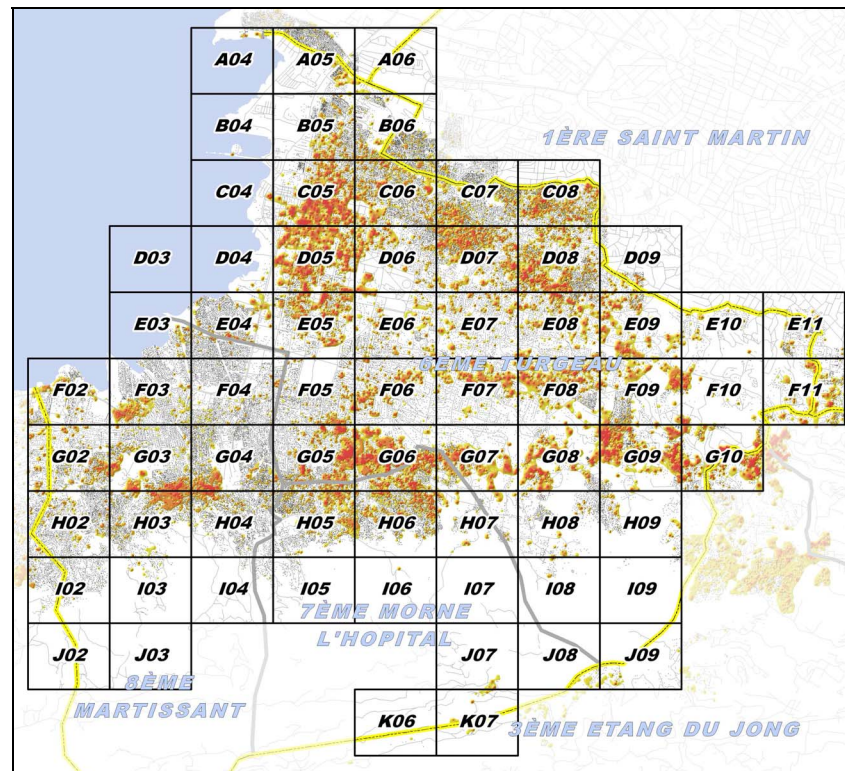


Figure 3: This map shows an example of an atlas map sheet with the aerial photograph in the background, the identified damages and additional information such as road names.



Media Contacts

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