

Supplementary Material for “Change Detection from a Street Image Pair using CNN Features and Superpixel Segmentation”

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Additional Results

Figures 1 - 100 show the results of the scenes of Panoramic Change Detection Dataset. The rows show, from top to bottom, input image pair, ground-truth of change detection, final change detection results, superpixel segmentation results, feature distance between each grid using feature of pool-5 layer, feature distance projected to superpixel segmentation result of each input image, probabilities of the sky and the ground estimated using Geometric Context.

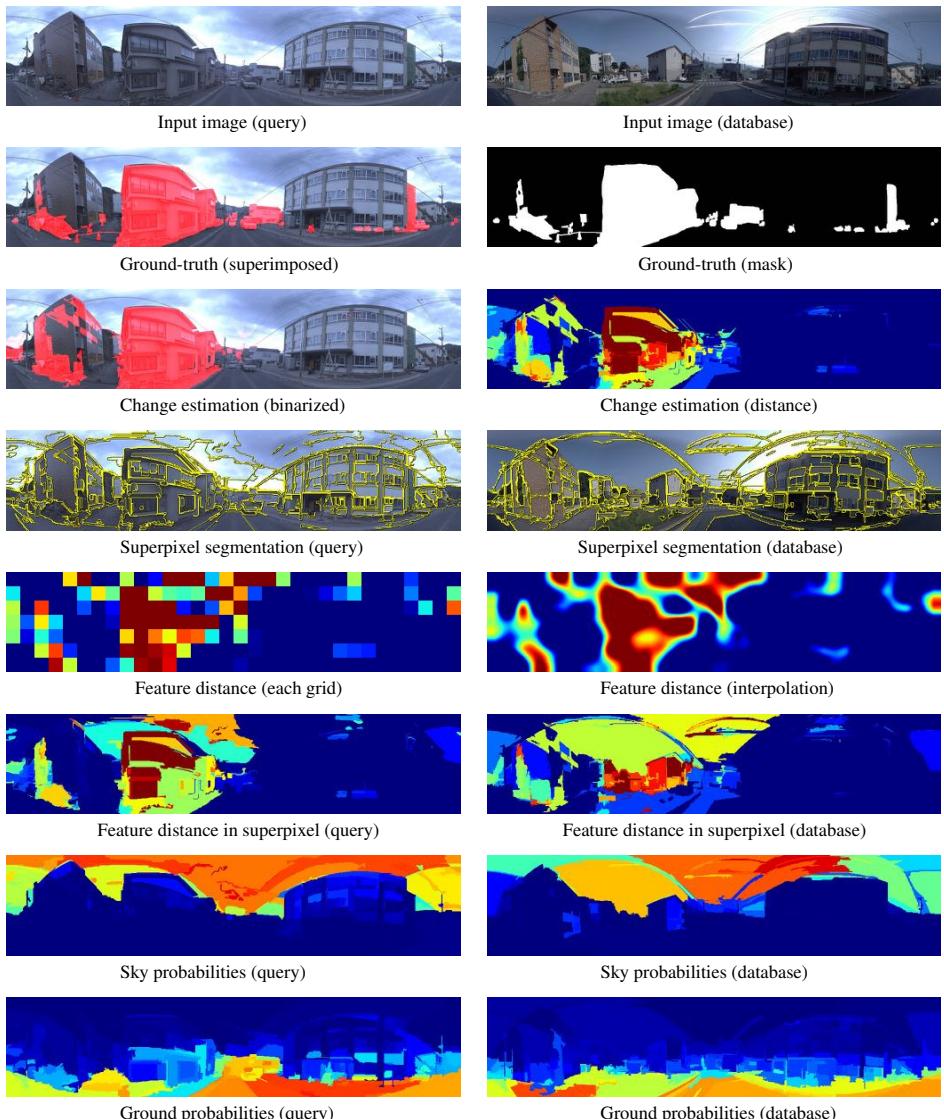


Figure 1: Results of change detection using pool-5 feature of CNN (Frame No. 1/100 in change detection dataset of tsunami)

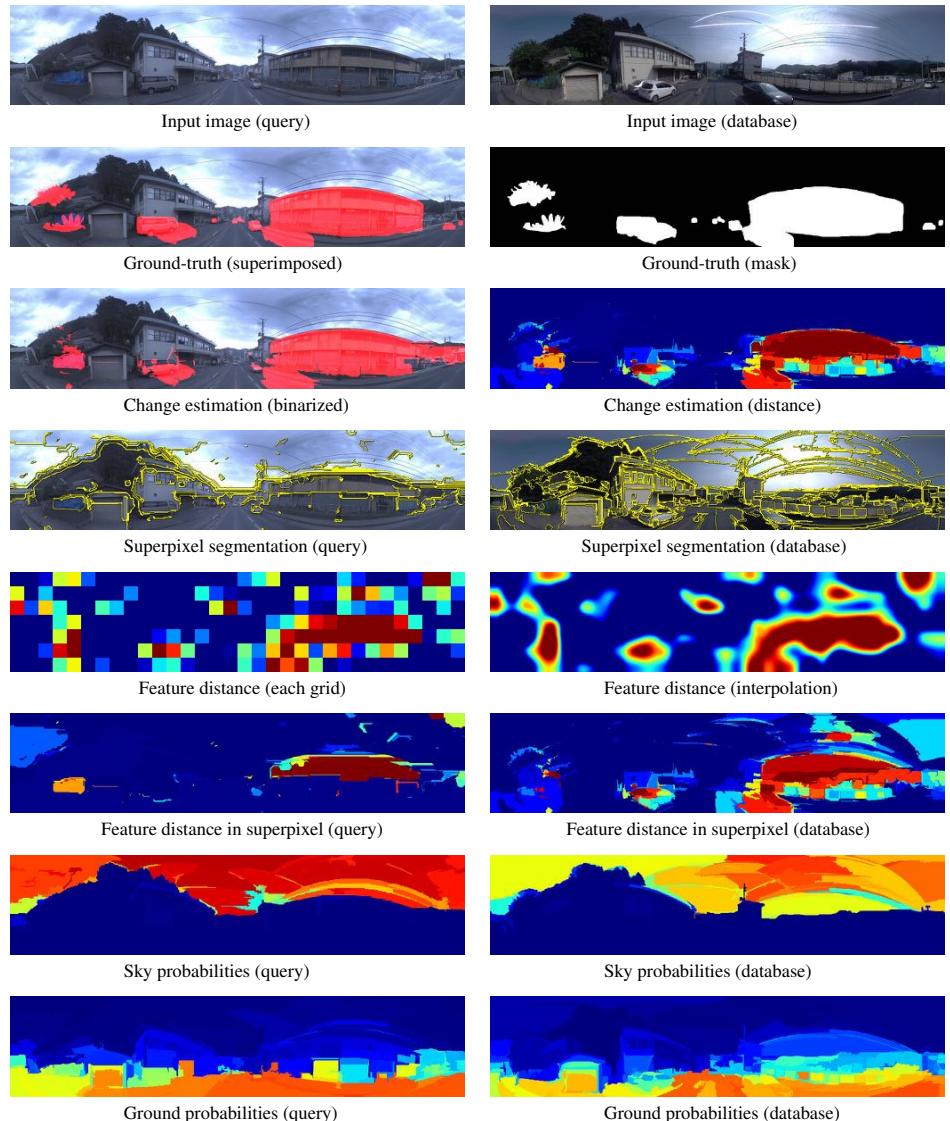


Figure 2: Results of change detection using pool-5 feature of CNN (Frame No. 2/100 in change detection dataset of tsunami)

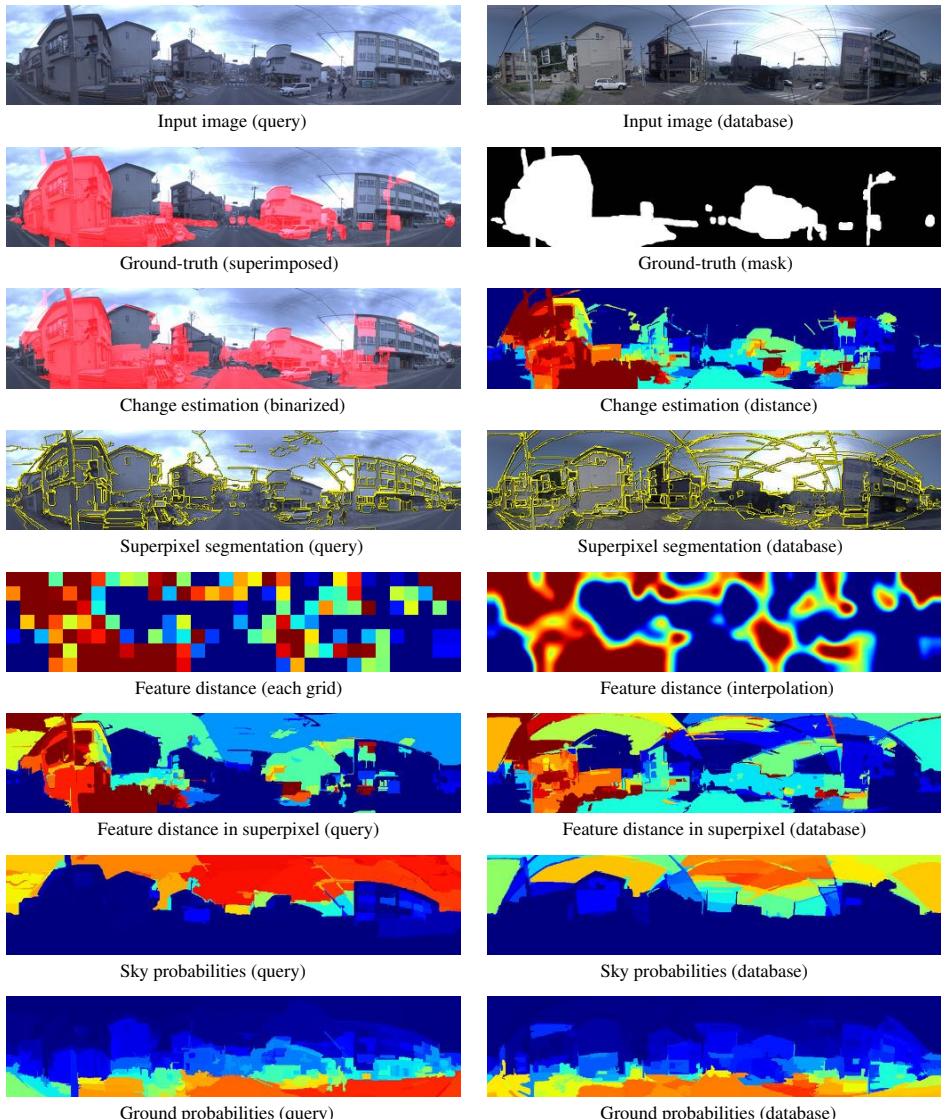


Figure 3: Results of change detection using pool-5 feature of CNN (Frame No. 3/100 in change detection dataset of tsunami)

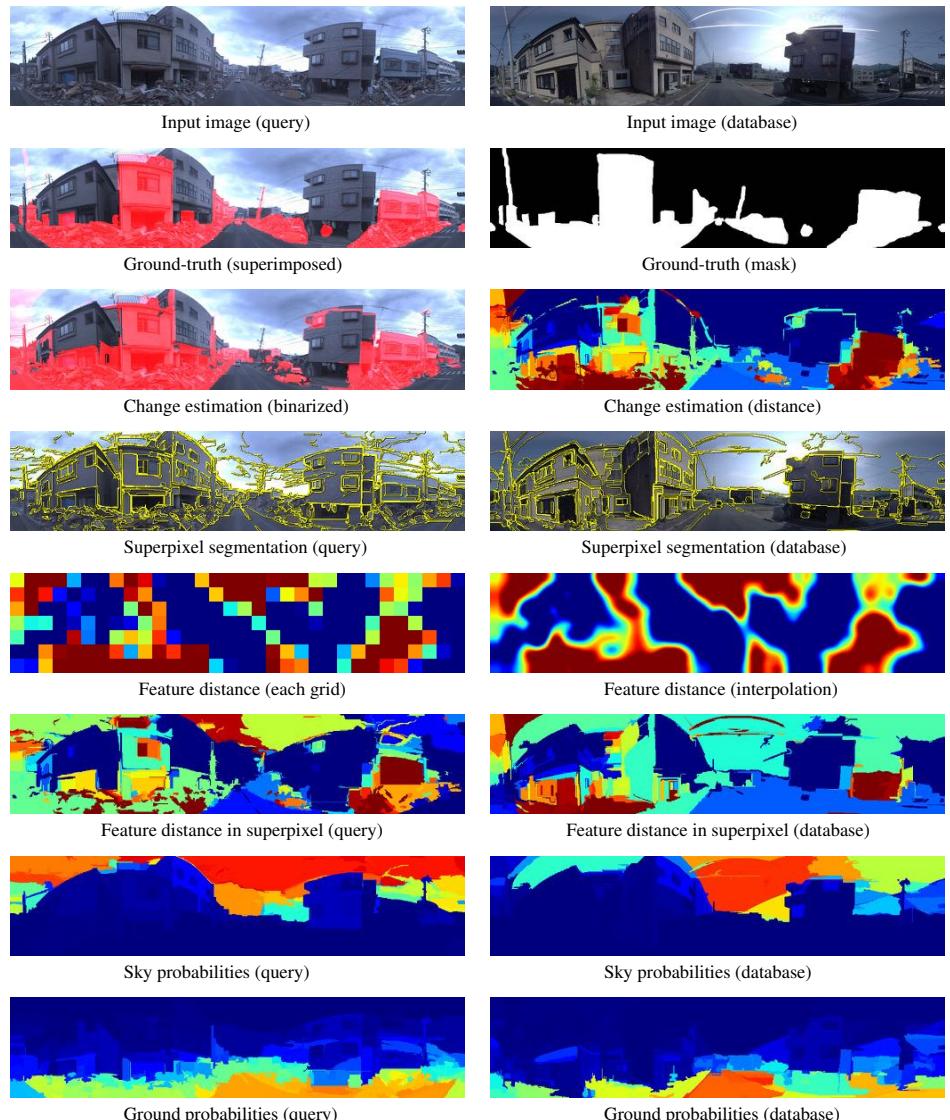


Figure 4: Results of change detection using pool-5 feature of CNN (Frame No. 4/100 in change detection dataset of tsunami)

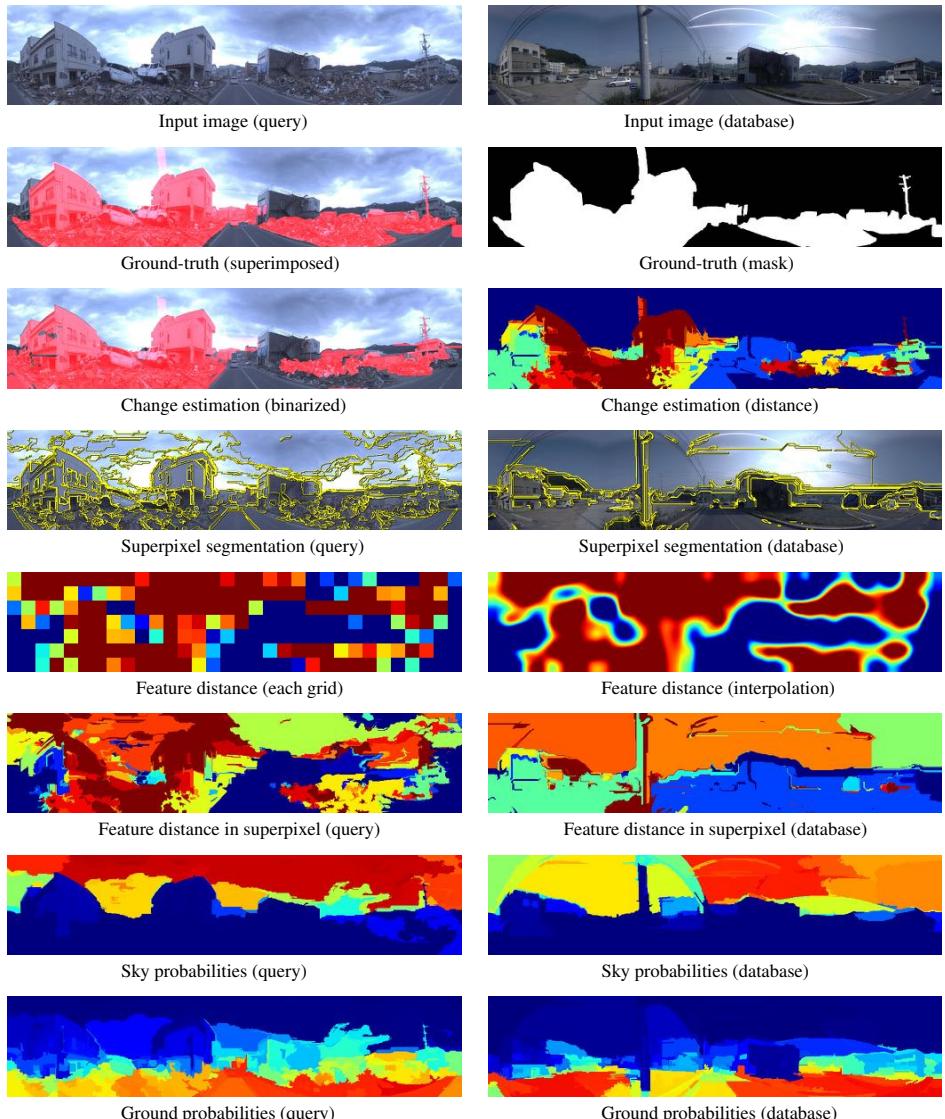


Figure 5: Results of change detection using pool-5 feature of CNN (Frame No. 5/100 in change detection dataset of tsunami)

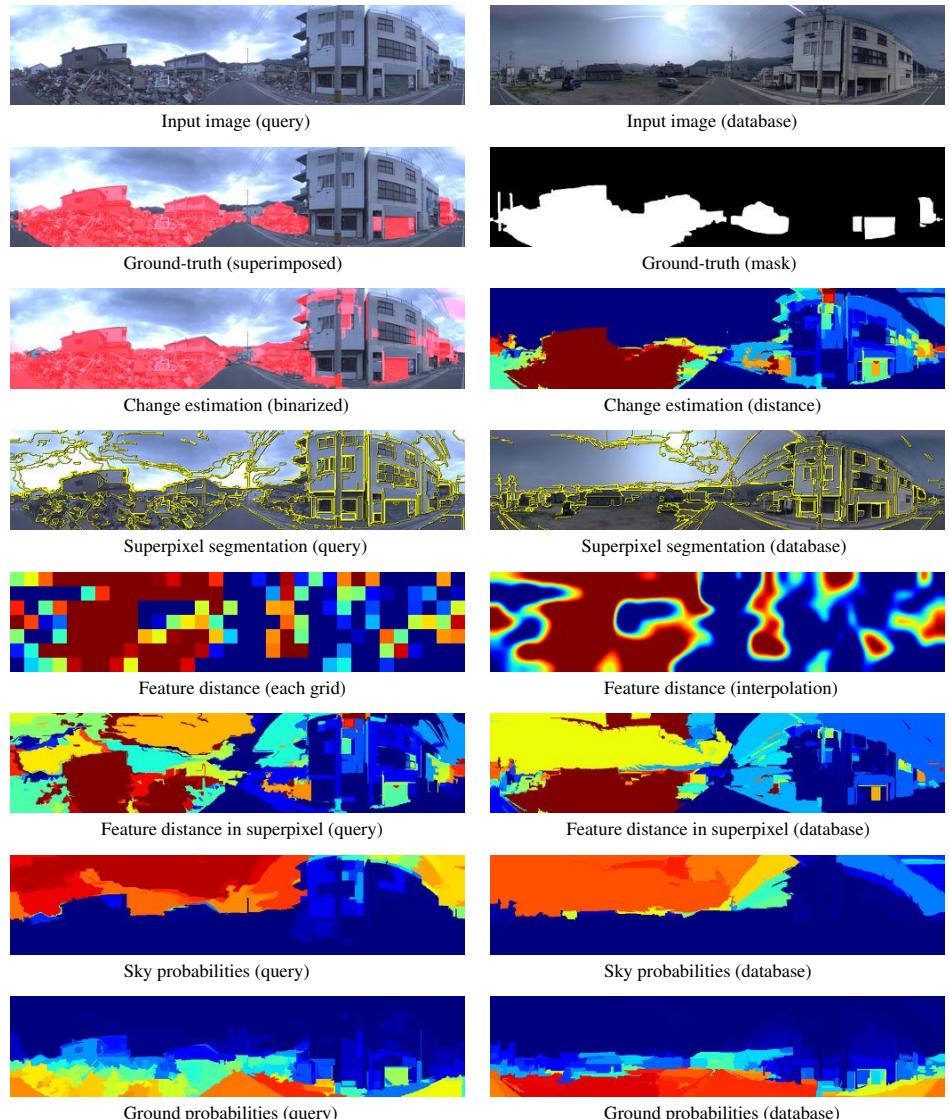


Figure 6: Results of change detection using pool-5 feature of CNN (Frame No. 6/100 in change detection dataset of tsunami)

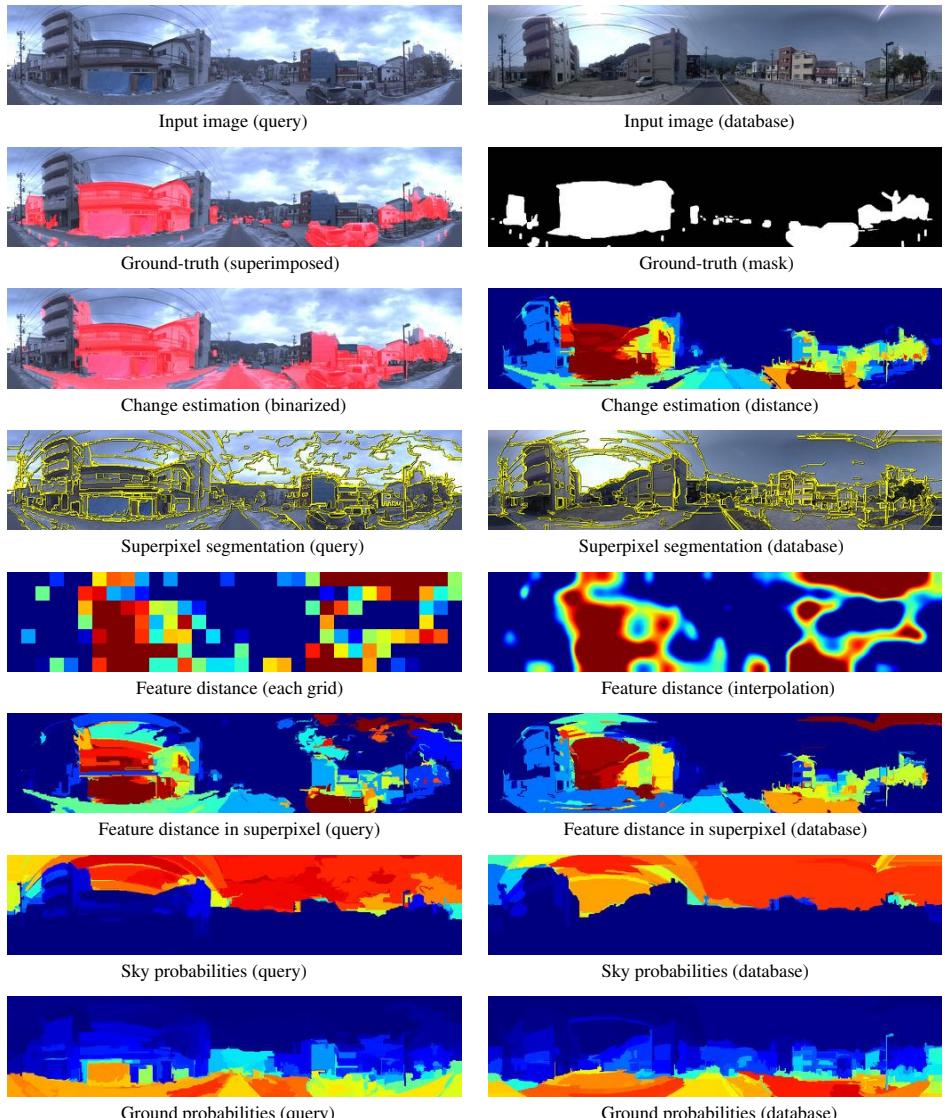


Figure 7: Results of change detection using pool-5 feature of CNN (Frame No. 7/100 in change detection dataset of tsunami)

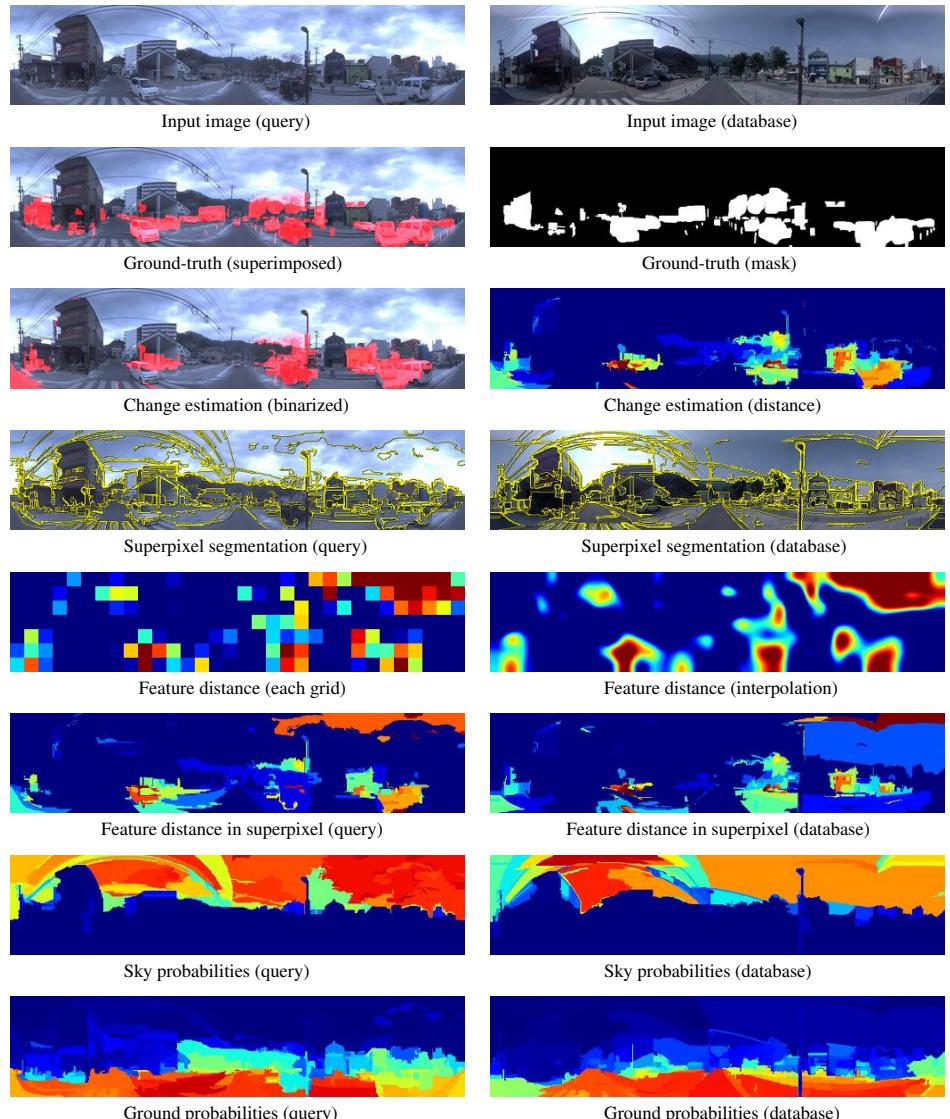


Figure 8: Results of change detection using pool-5 feature of CNN (Frame No. 8/100 in change detection dataset of tsunami)

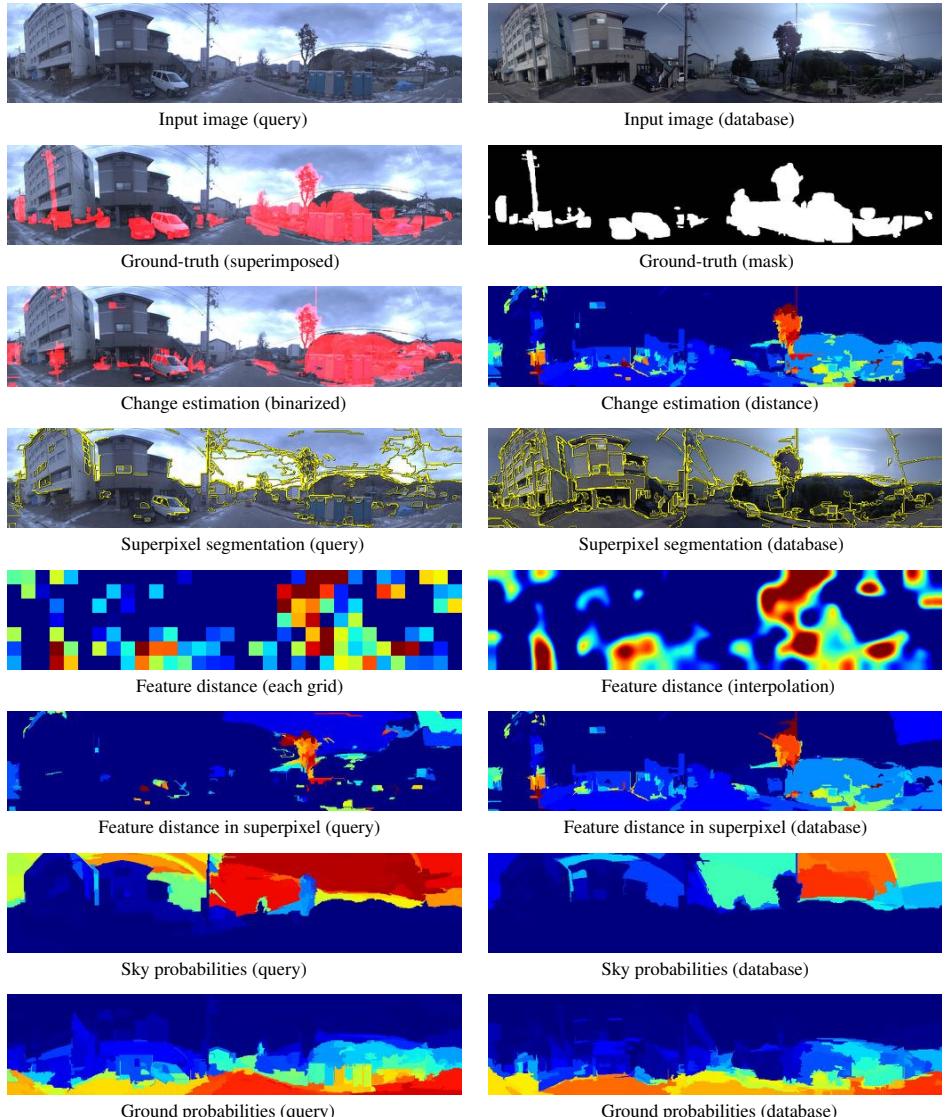


Figure 9: Results of change detection using pool-5 feature of CNN (Frame No. 9/100 in change detection dataset of tsunami)

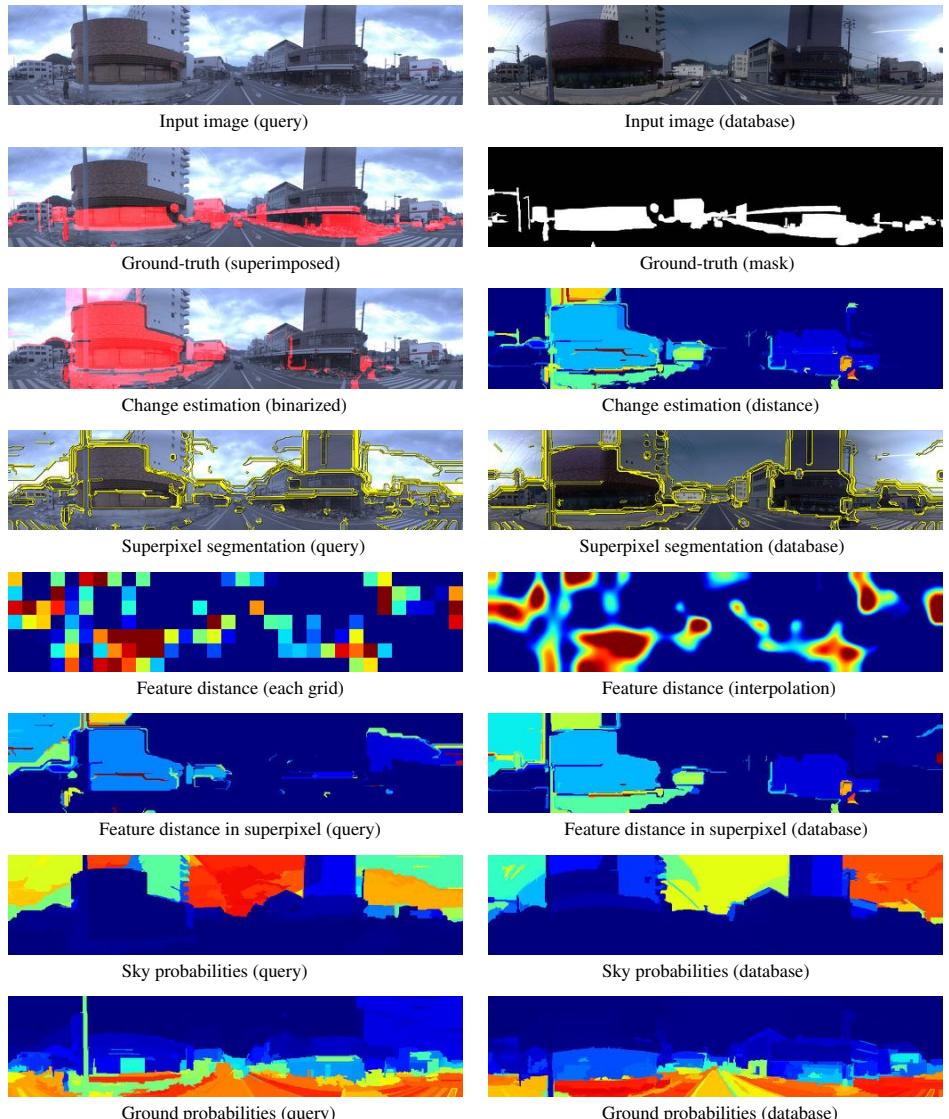


Figure 10: Results of change detection using pool-5 feature of CNN (Frame No. 10/100 in change detection dataset of tsunami)

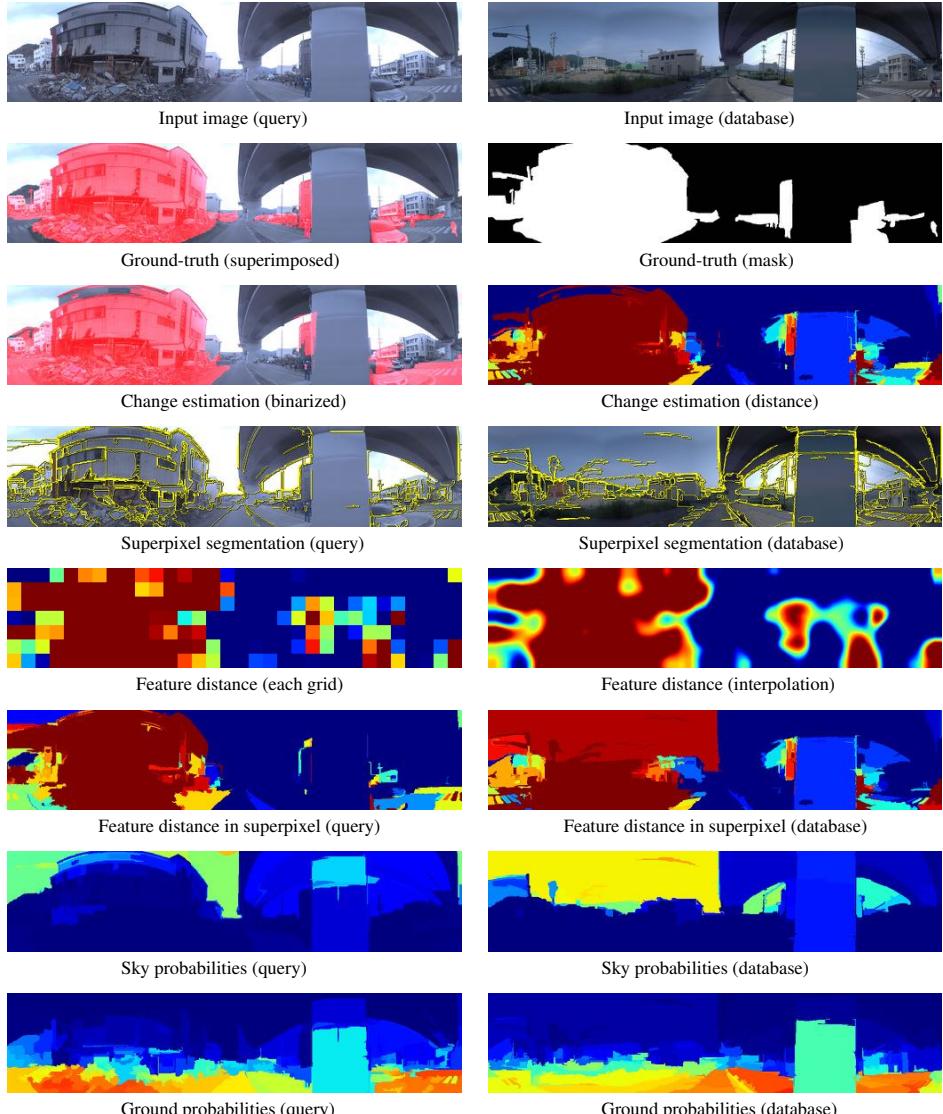


Figure 11: Results of change detection using pool-5 feature of CNN (Frame No. 11/100 in change detection dataset of tsunami)

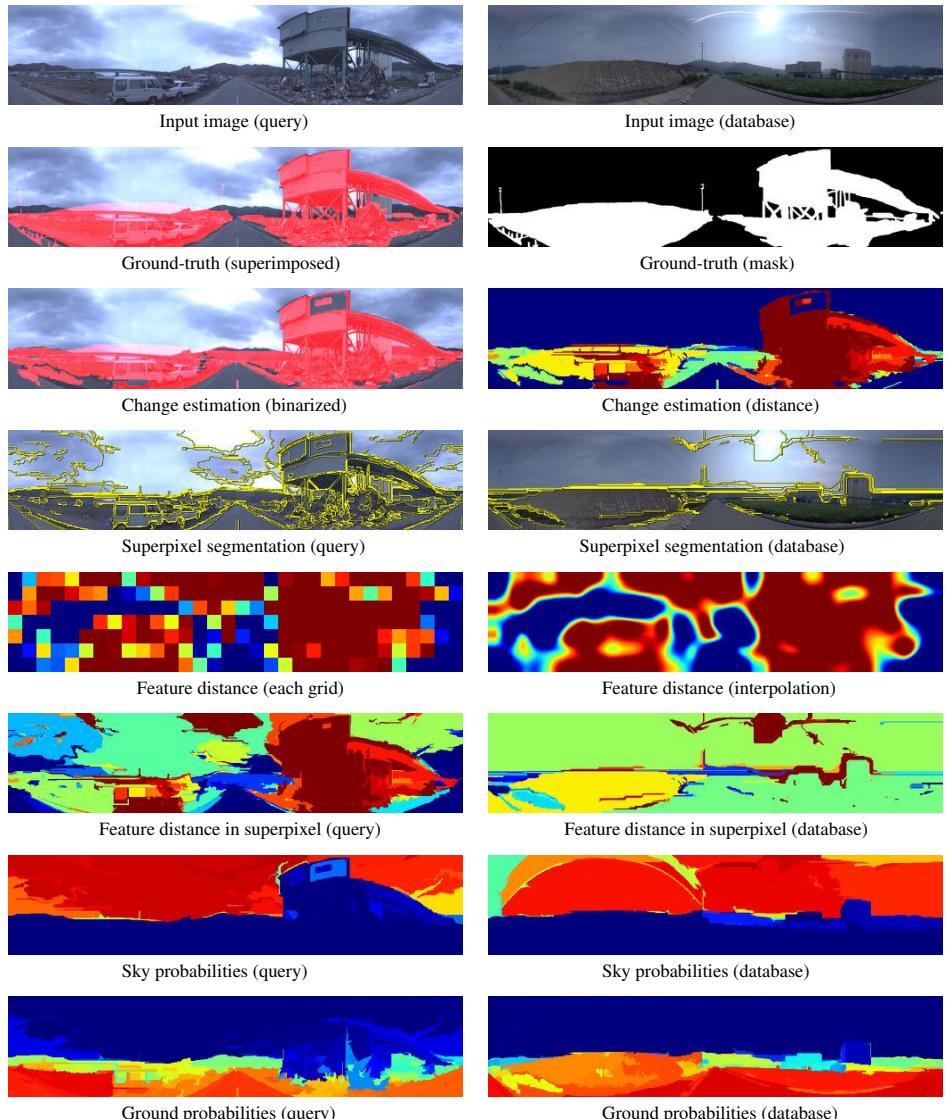


Figure 12: Results of change detection using pool-5 feature of CNN (Frame No. 12/100 in change detection dataset of tsunami)

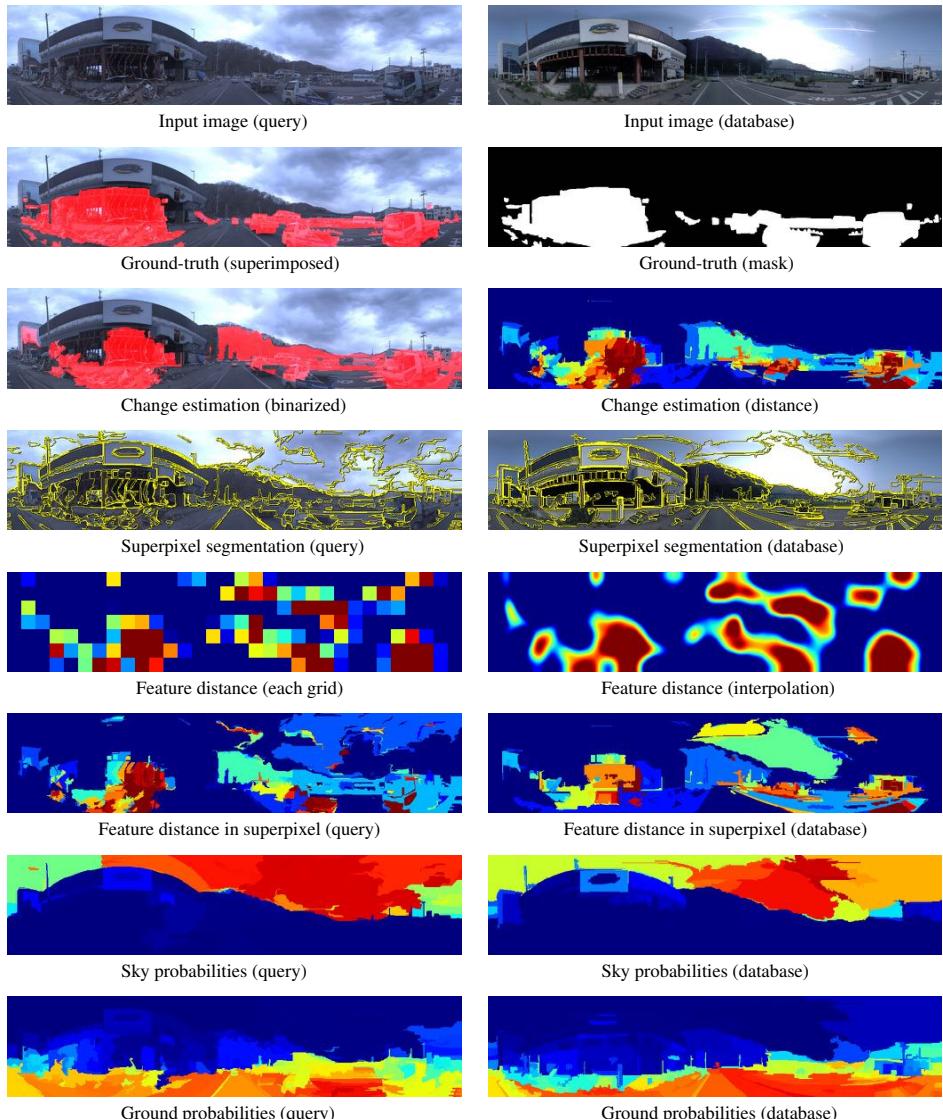


Figure 13: Results of change detection using pool-5 feature of CNN (Frame No. 13/100 in change detection dataset of tsunami)

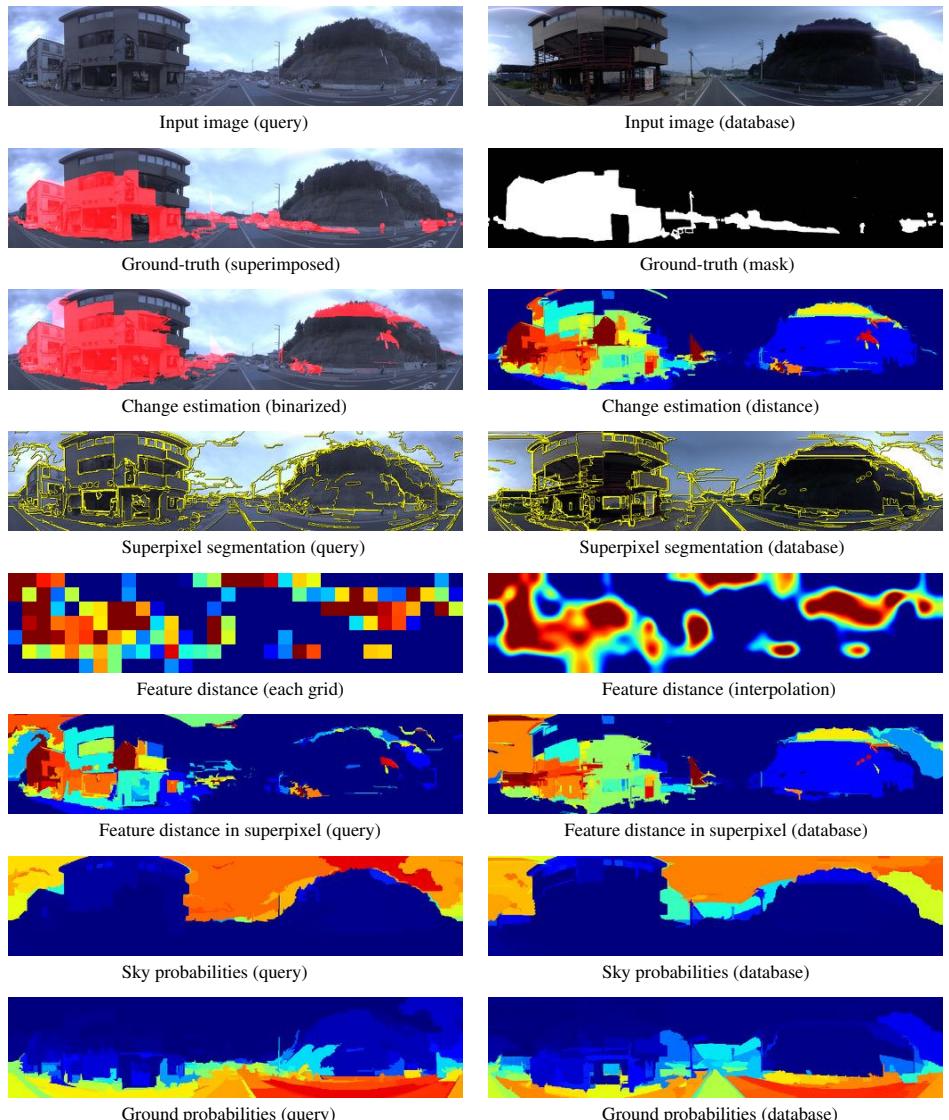


Figure 14: Results of change detection using pool-5 feature of CNN (Frame No. 14/100 in change detection dataset of tsunami)

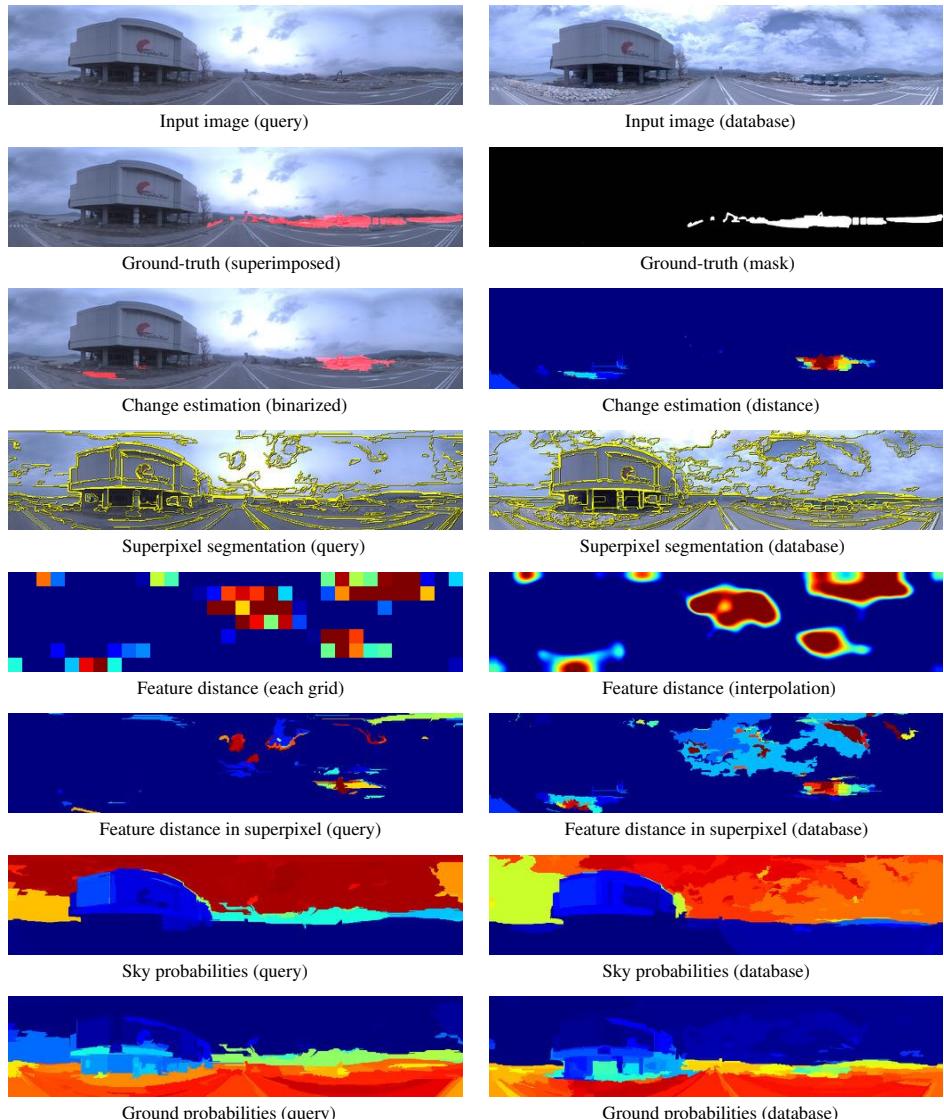


Figure 15: Results of change detection using pool-5 feature of CNN (Frame No. 15/100 in change detection dataset of tsunami)

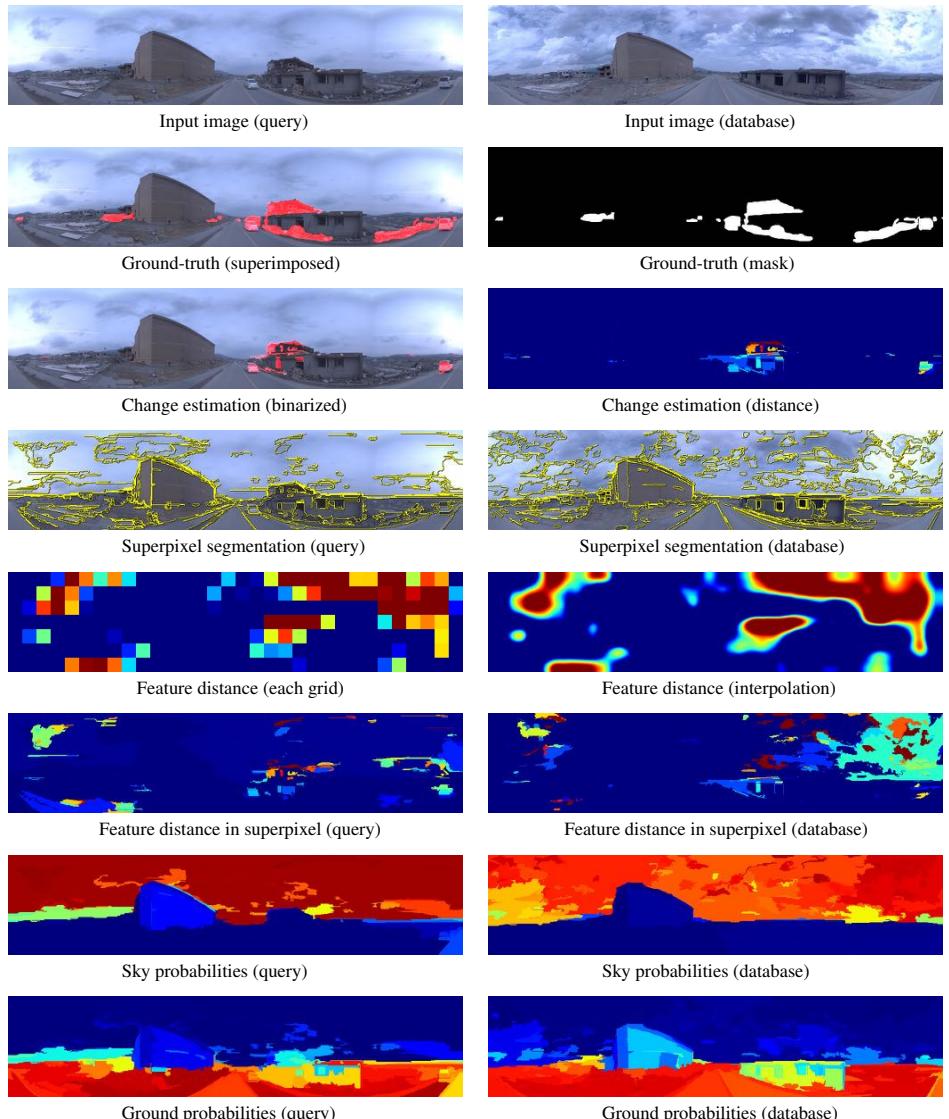


Figure 16: Results of change detection using pool-5 feature of CNN (Frame No. 16/100 in change detection dataset of tsunami)

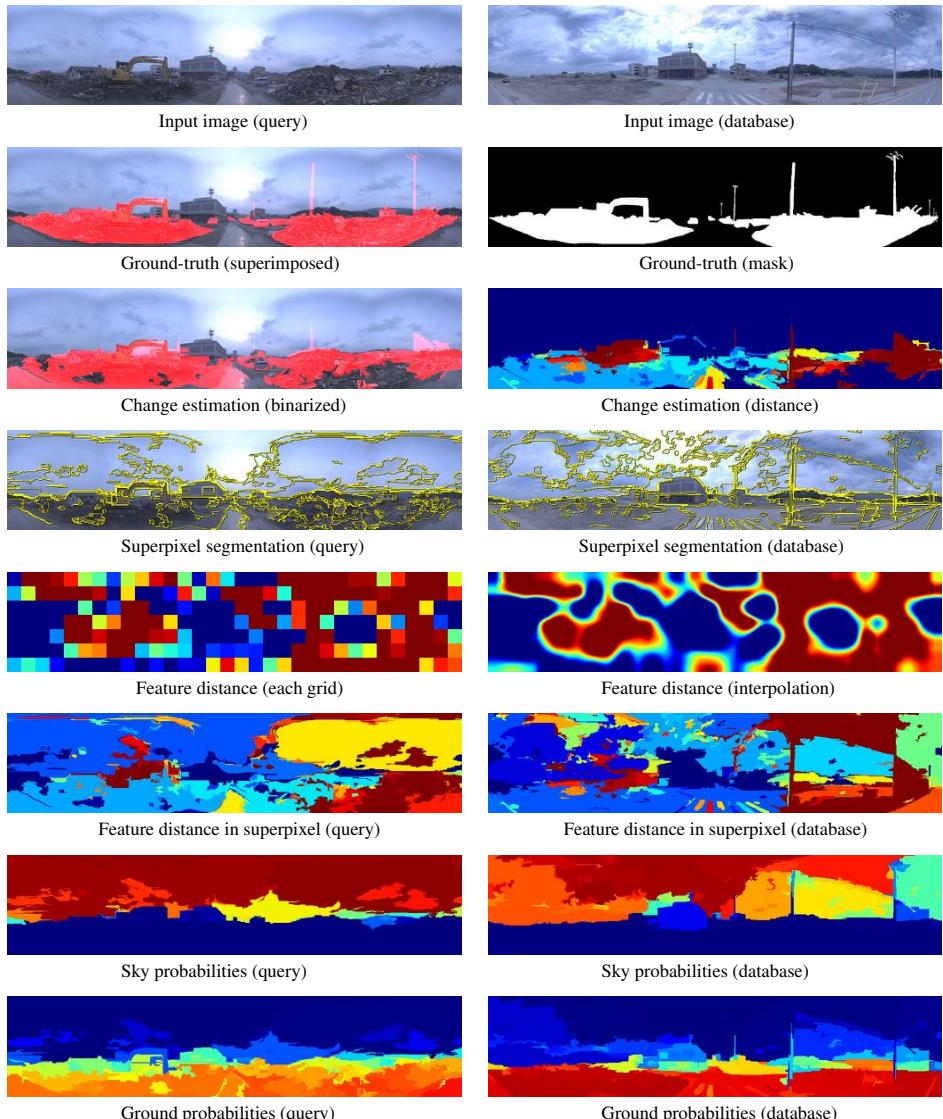


Figure 17: Results of change detection using pool-5 feature of CNN (Frame No. 17/100 in change detection dataset of tsunami)

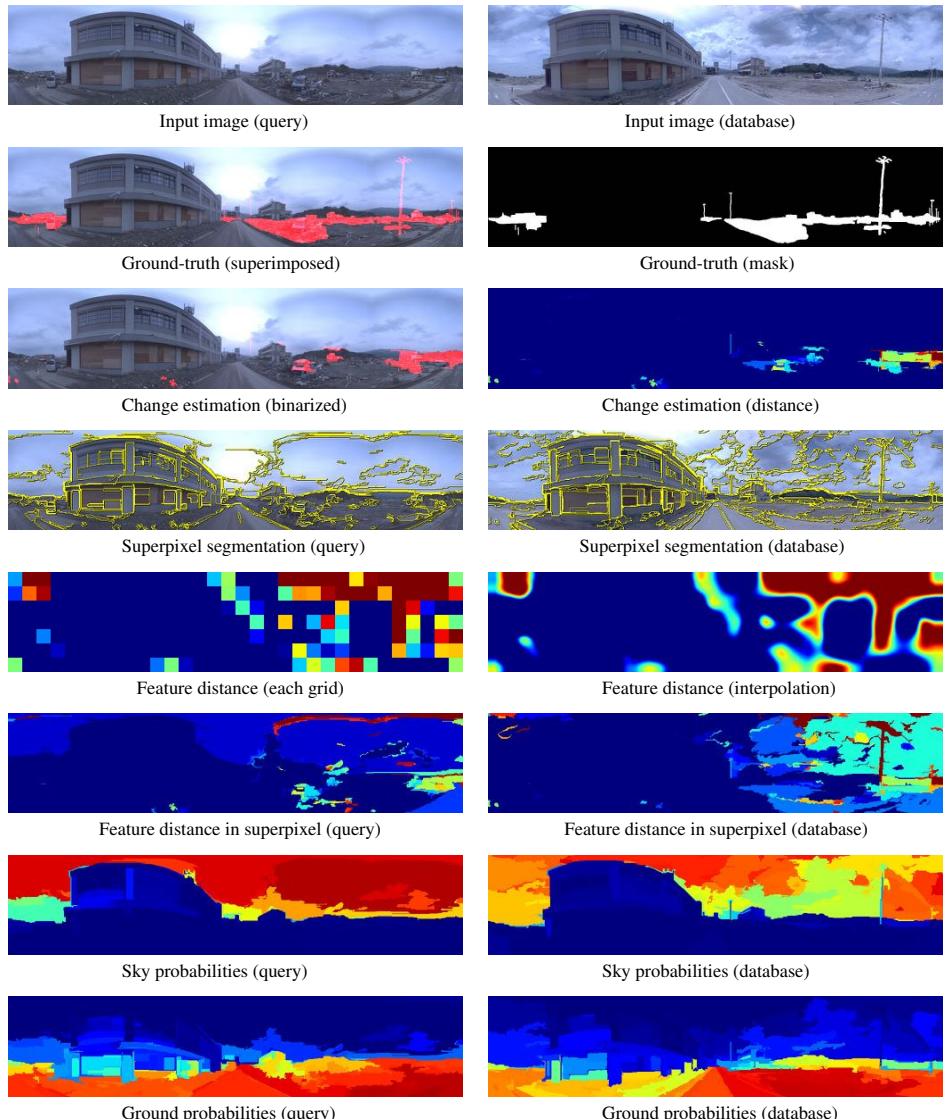


Figure 18: Results of change detection using pool-5 feature of CNN (Frame No. 18/100 in change detection dataset of tsunami)

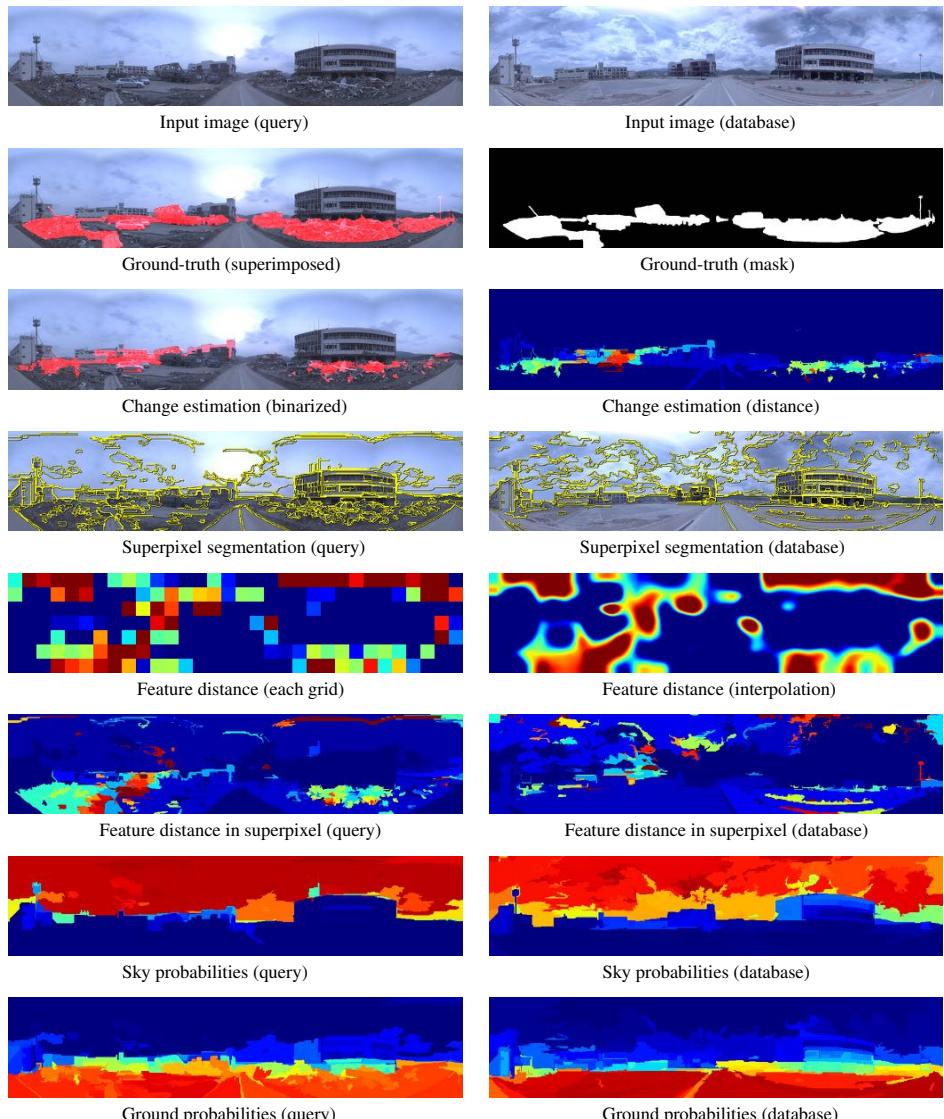


Figure 19: Results of change detection using pool-5 feature of CNN (Frame No. 19/100 in change detection dataset of tsunami)

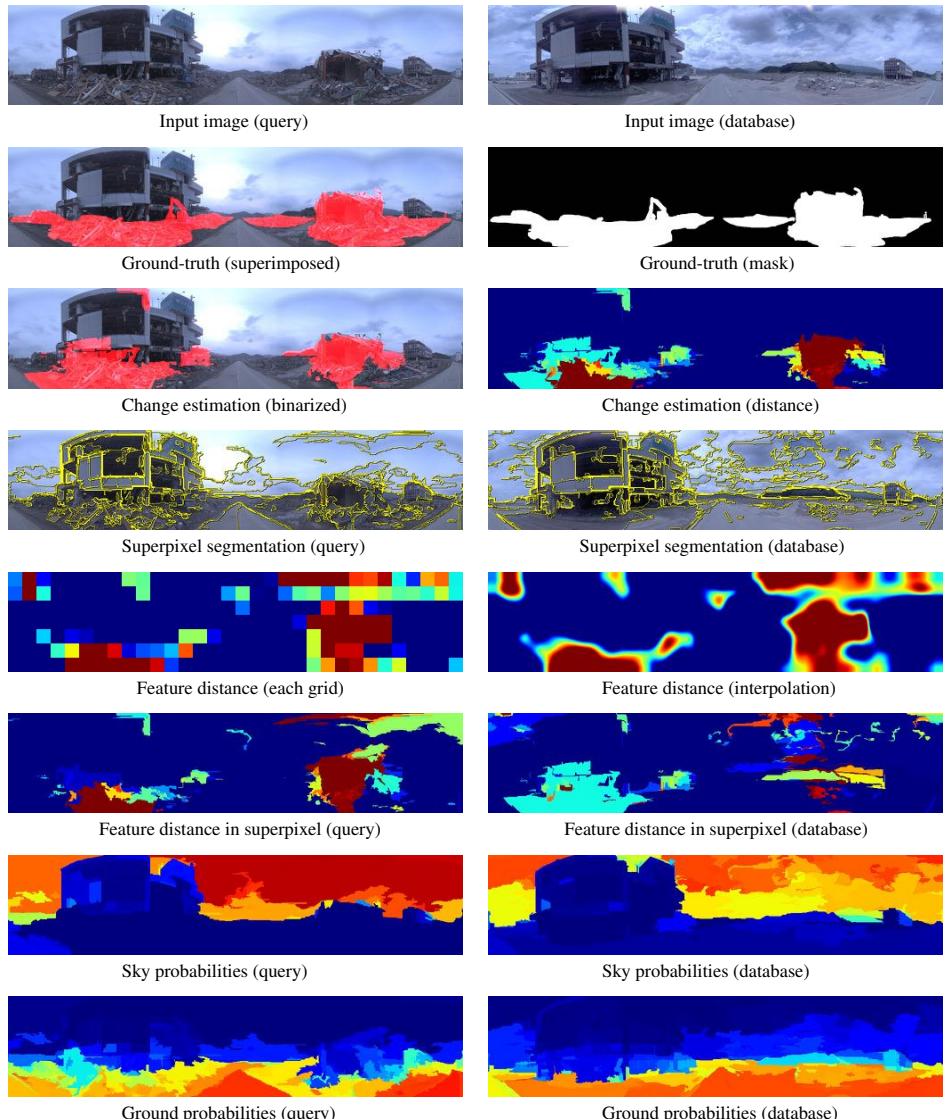


Figure 20: Results of change detection using pool-5 feature of CNN (Frame No. 20/100 in change detection dataset of tsunami)

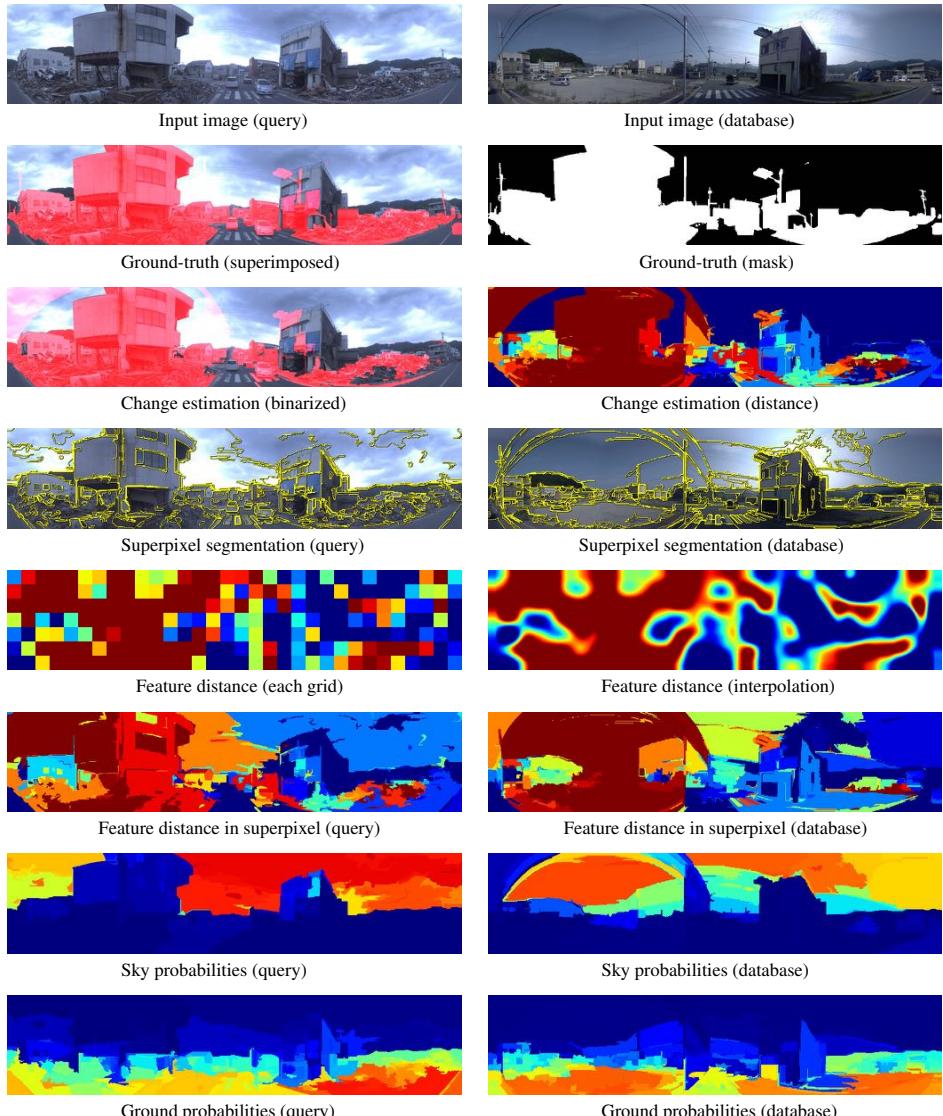


Figure 21: Results of change detection using pool-5 feature of CNN (Frame No. 21/100 in change detection dataset of tsunami)

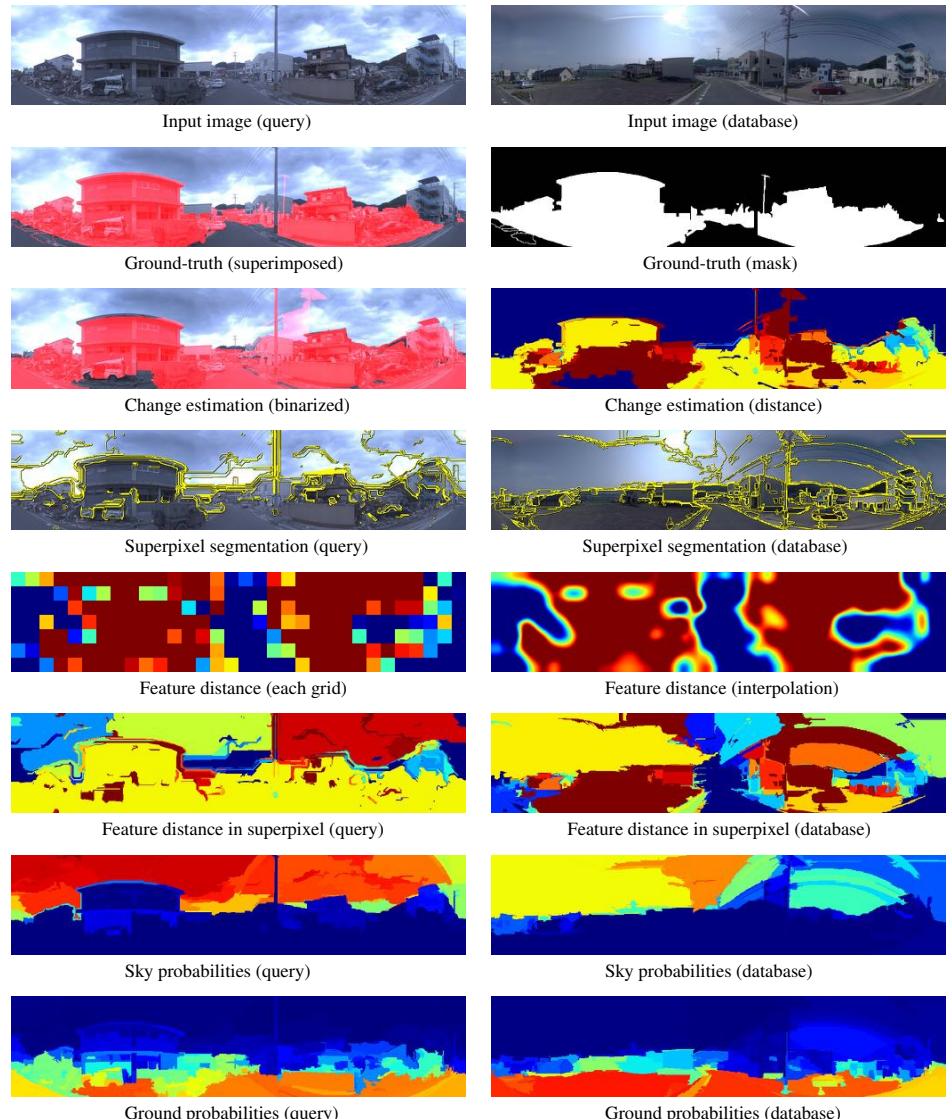


Figure 22: Results of change detection using pool-5 feature of CNN (Frame No. 22/100 in change detection dataset of tsunami)

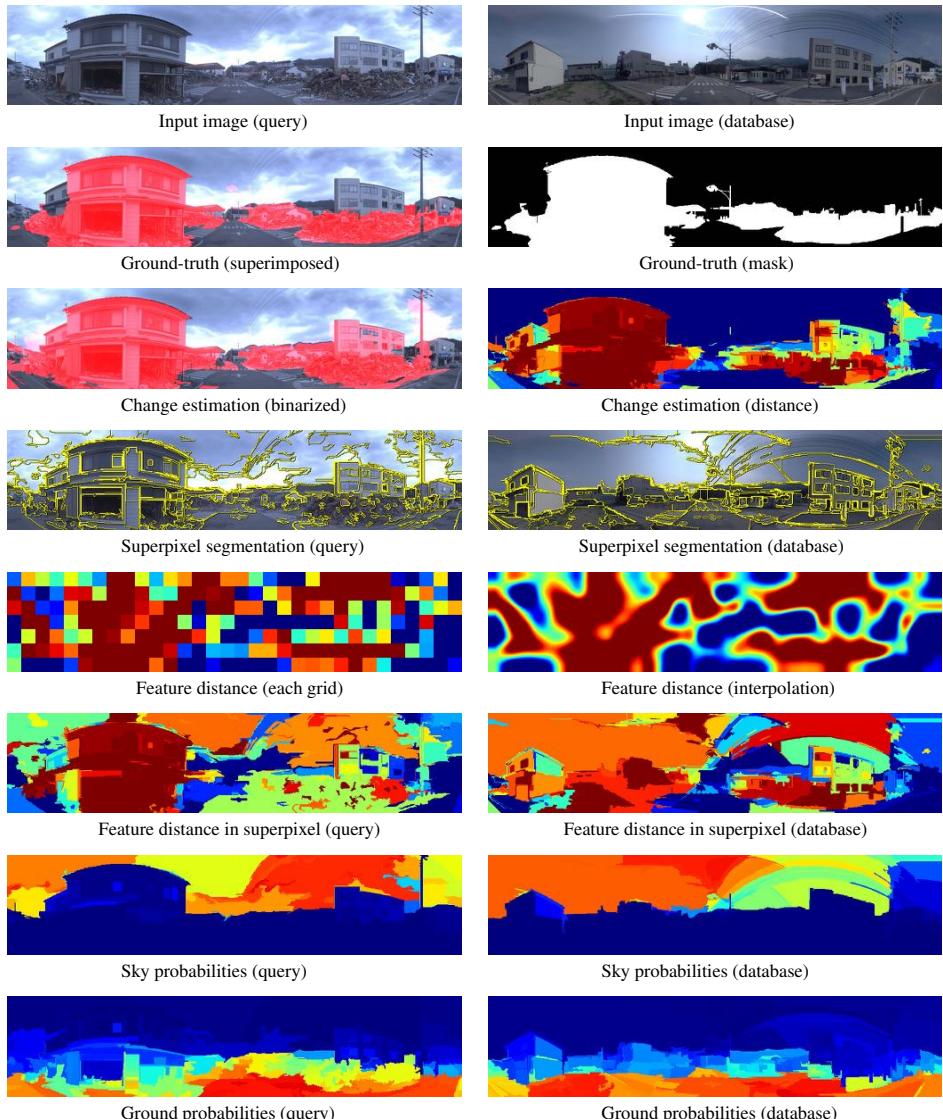


Figure 23: Results of change detection using pool-5 feature of CNN (Frame No. 23/100 in change detection dataset of tsunami)

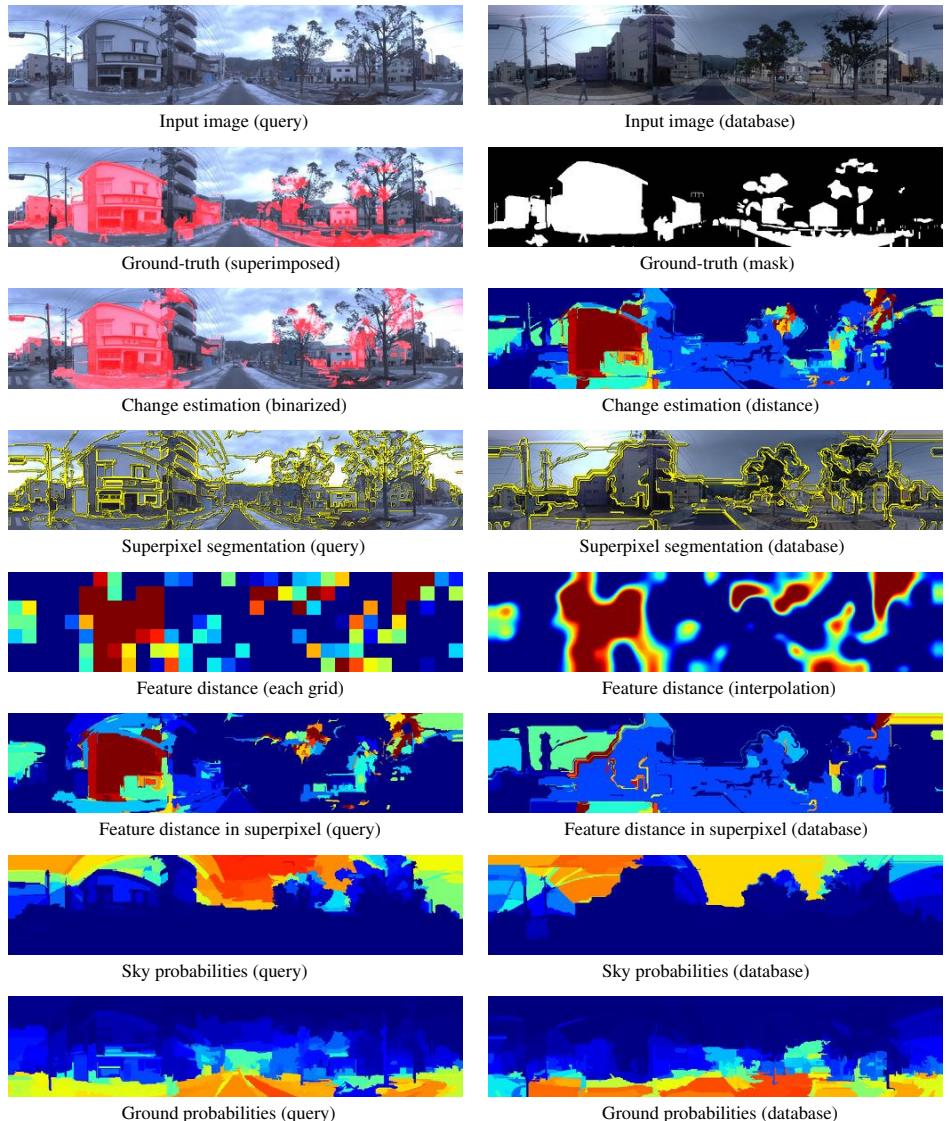


Figure 24: Results of change detection using pool-5 feature of CNN (Frame No. 24/100 in change detection dataset of tsunami)

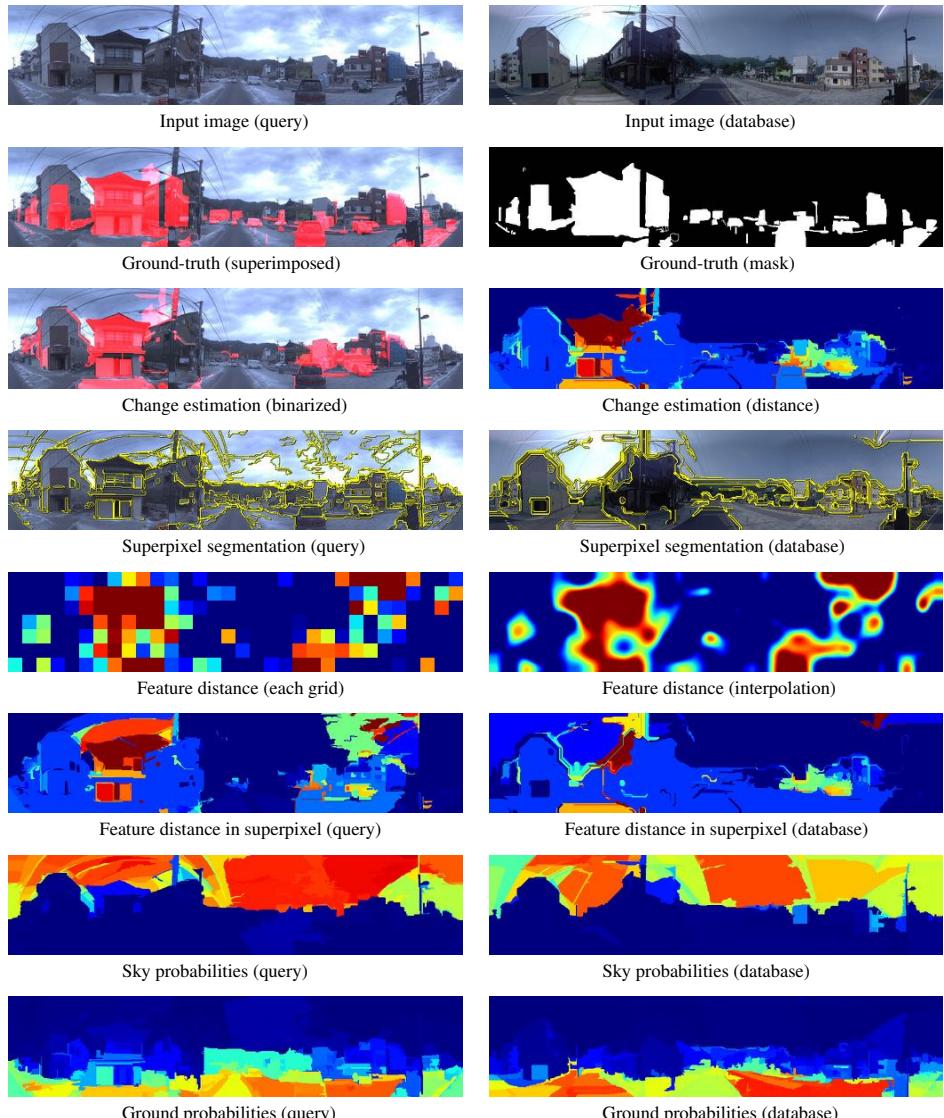


Figure 25: Results of change detection using pool-5 feature of CNN (Frame No. 25/100 in change detection dataset of tsunami)

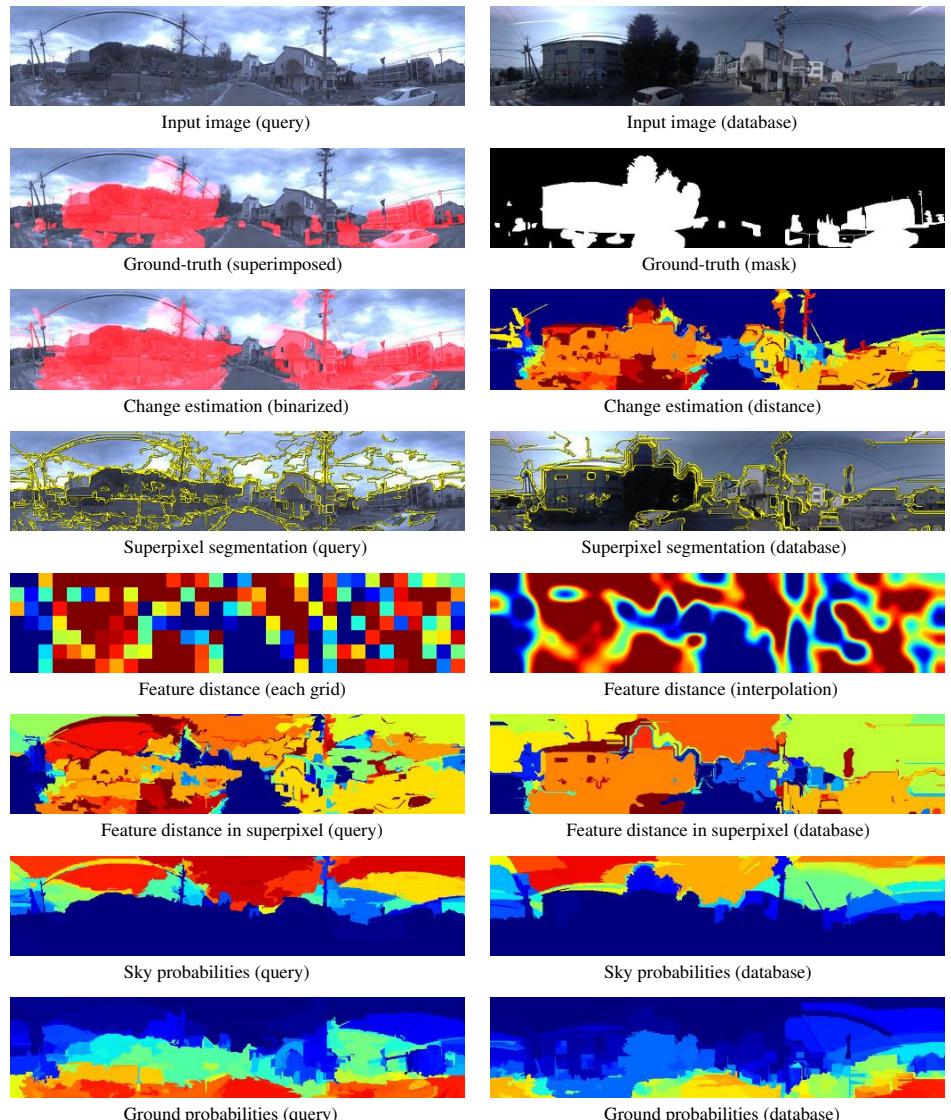


Figure 26: Results of change detection using pool-5 feature of CNN (Frame No. 26/100 in change detection dataset of tsunami)

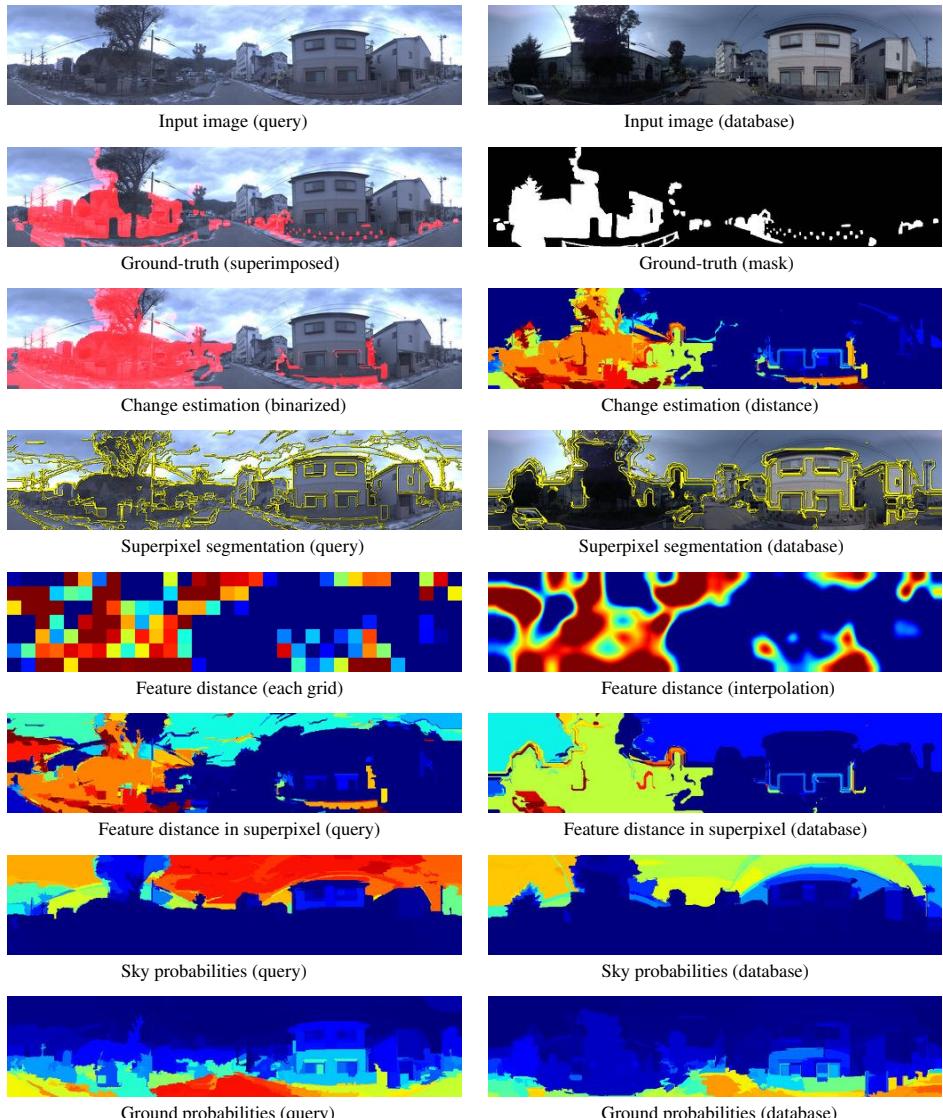


Figure 27: Results of change detection using pool-5 feature of CNN (Frame No. 27/100 in change detection dataset of tsunami)

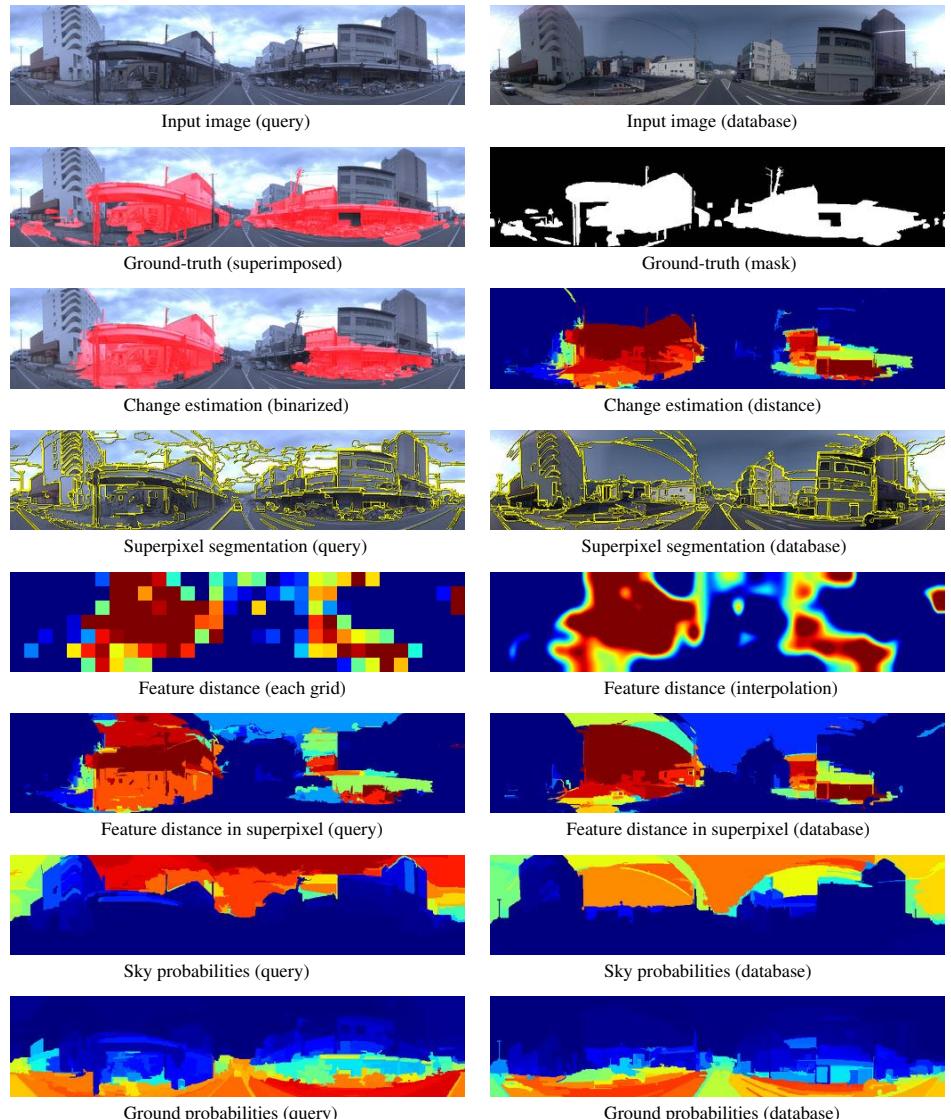


Figure 28: Results of change detection using pool-5 feature of CNN (Frame No. 28/100 in change detection dataset of tsunami)

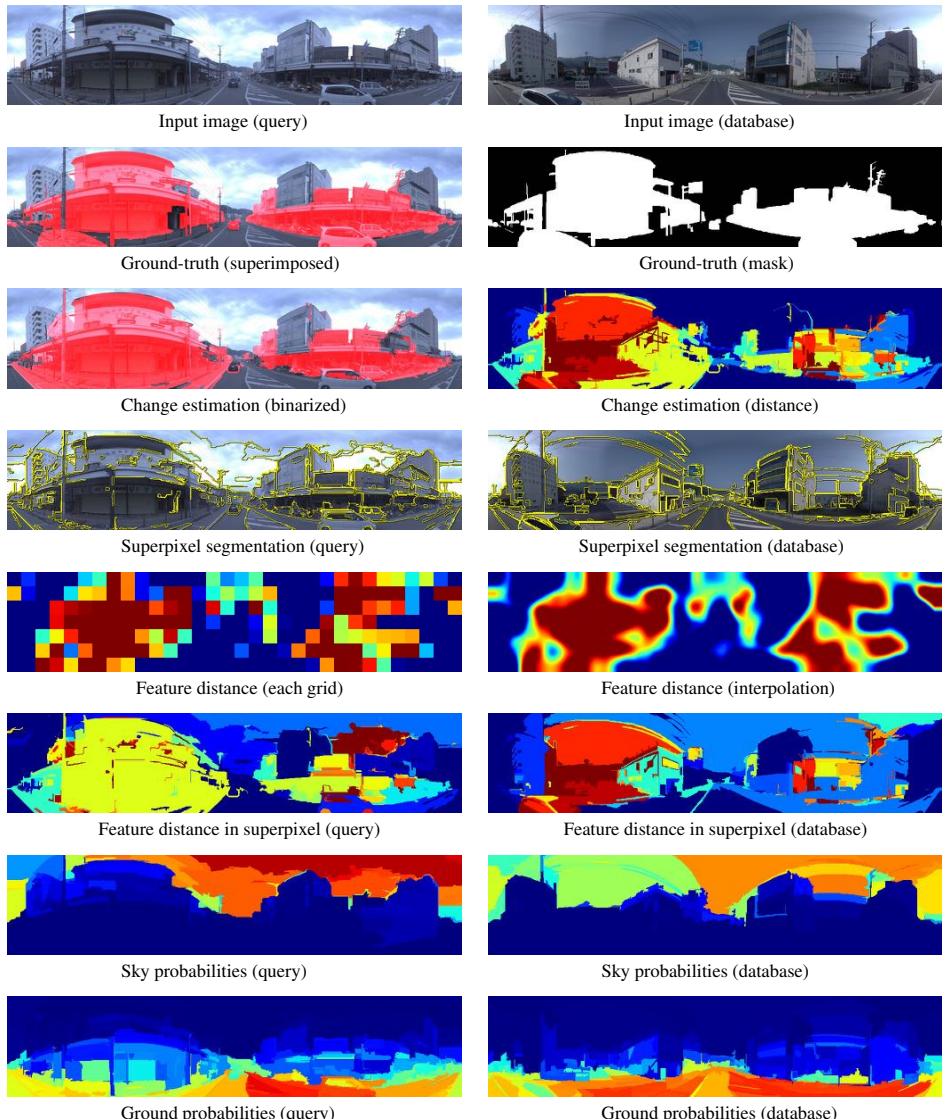


Figure 29: Results of change detection using pool-5 feature of CNN (Frame No. 29/100 in change detection dataset of tsunami)

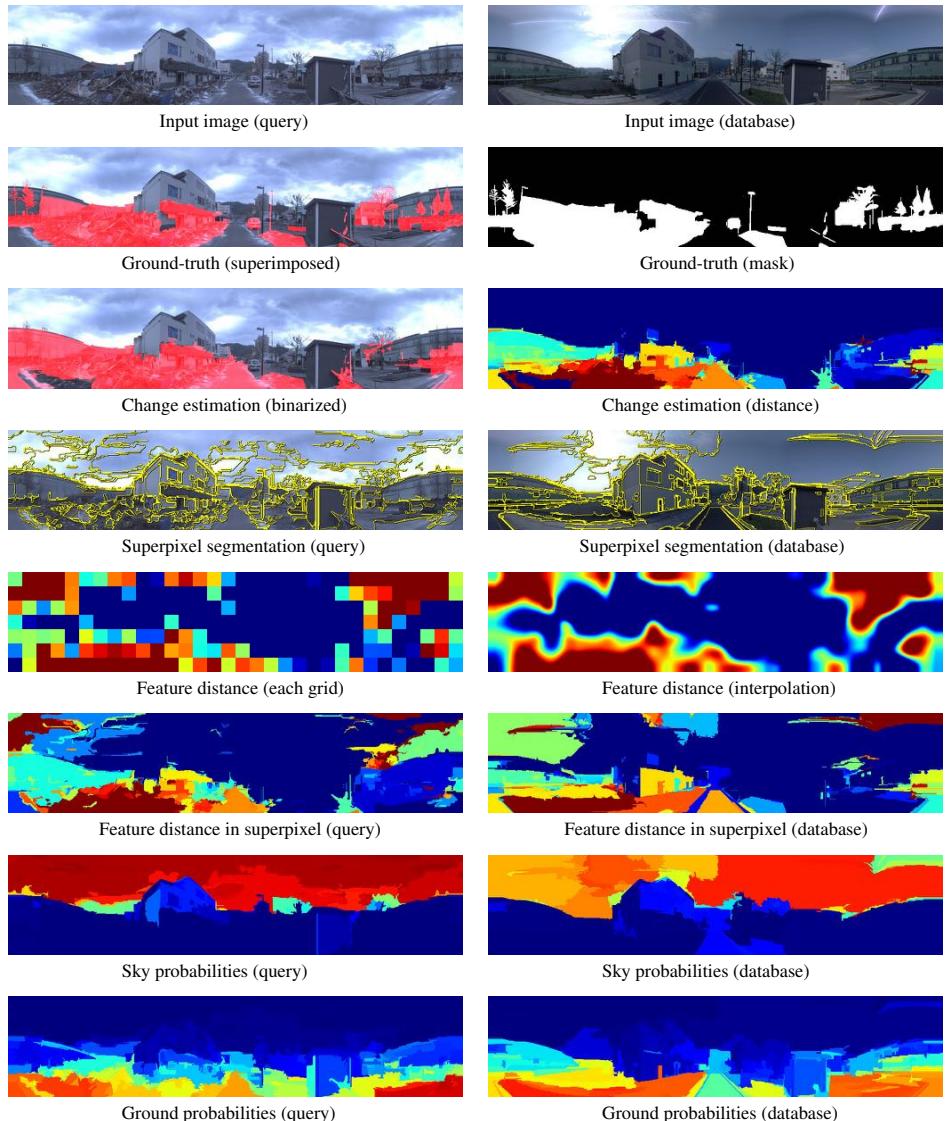


Figure 30: Results of change detection using pool-5 feature of CNN (Frame No. 30/100 in change detection dataset of tsunami)

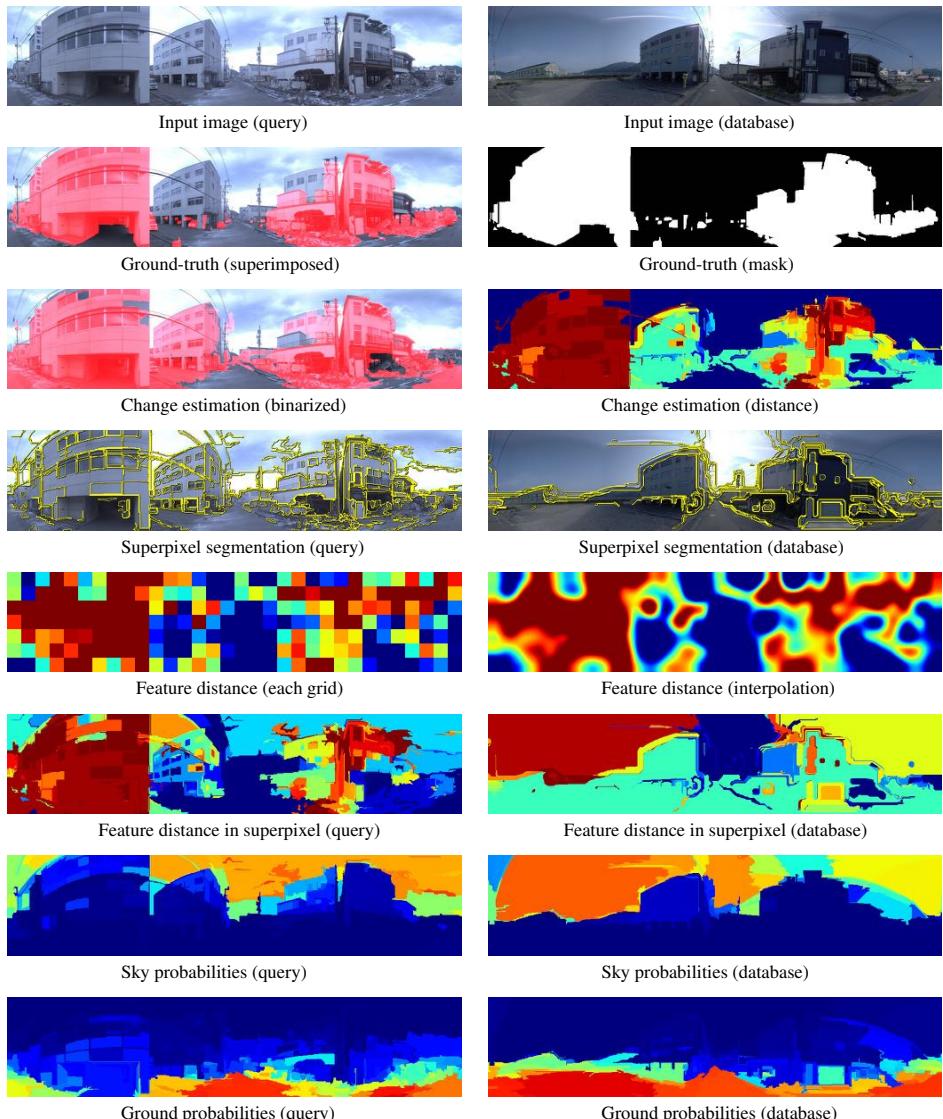


Figure 31: Results of change detection using pool-5 feature of CNN (Frame No. 31/100 in change detection dataset of tsunami)

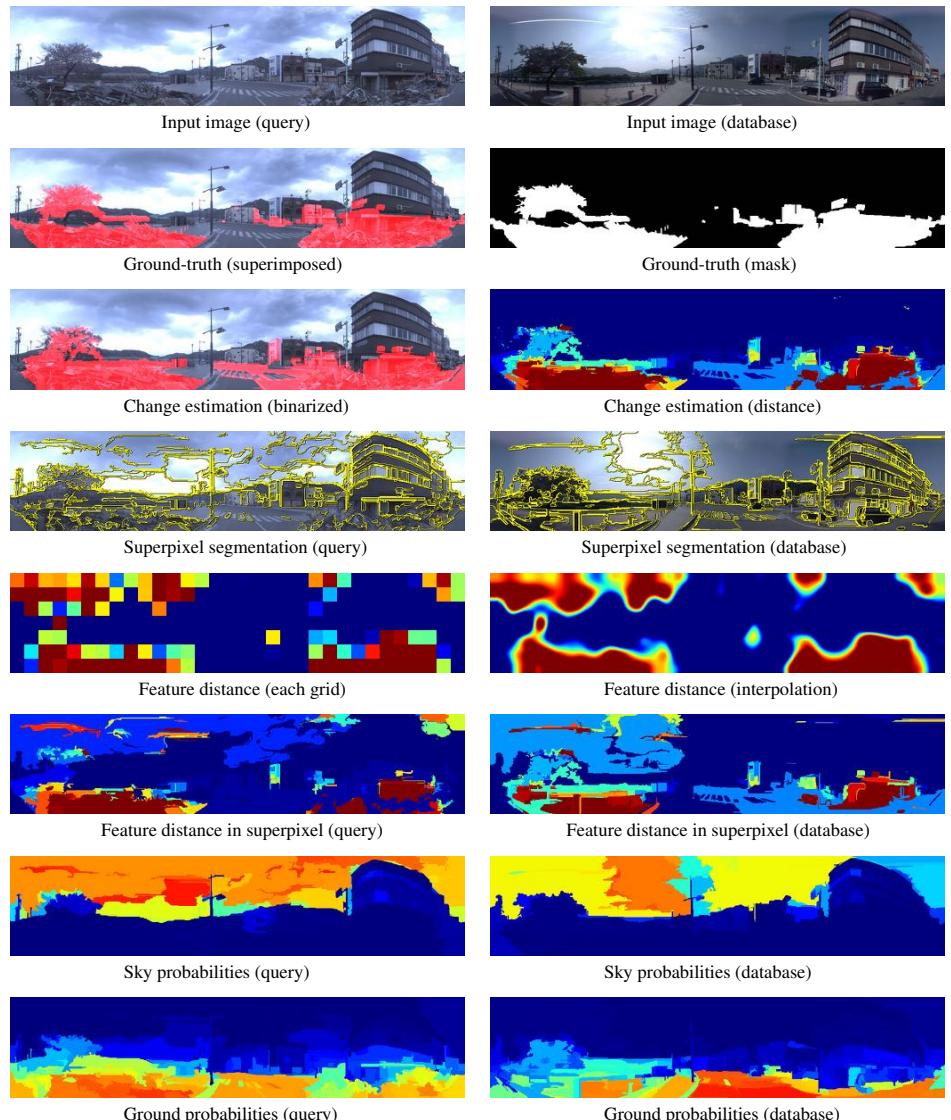


Figure 32: Results of change detection using pool-5 feature of CNN (Frame No. 32/100 in change detection dataset of tsunami)

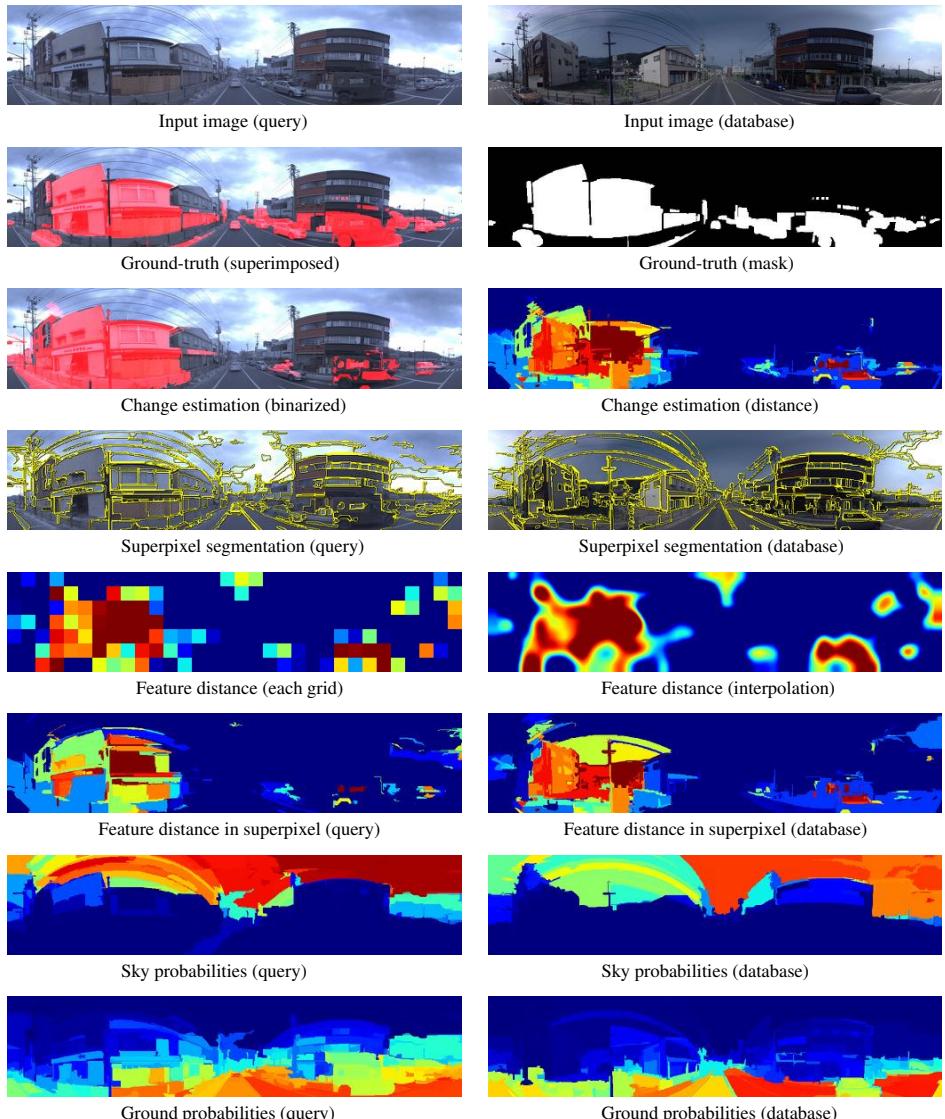


Figure 33: Results of change detection using pool-5 feature of CNN (Frame No. 33/100 in change detection dataset of tsunami)

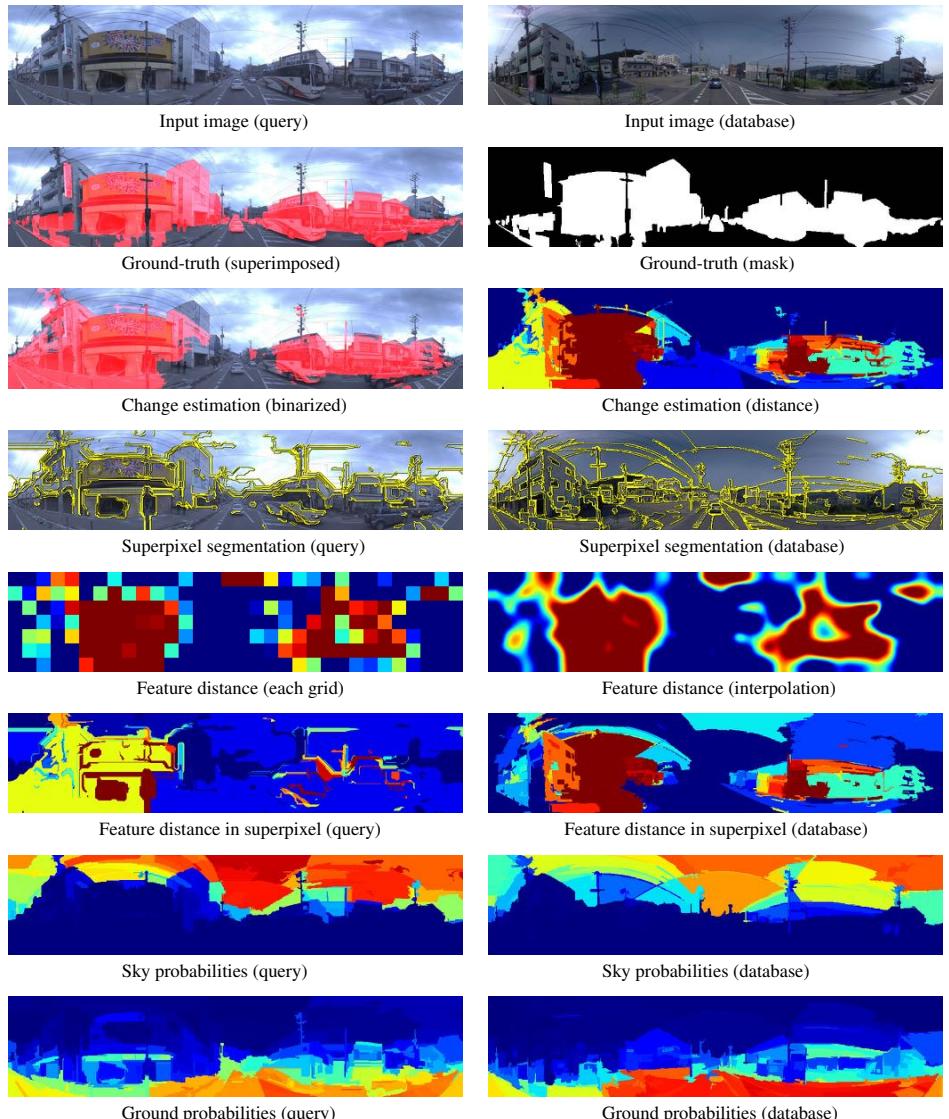


Figure 34: Results of change detection using pool-5 feature of CNN (Frame No. 34/100 in change detection dataset of tsunami)

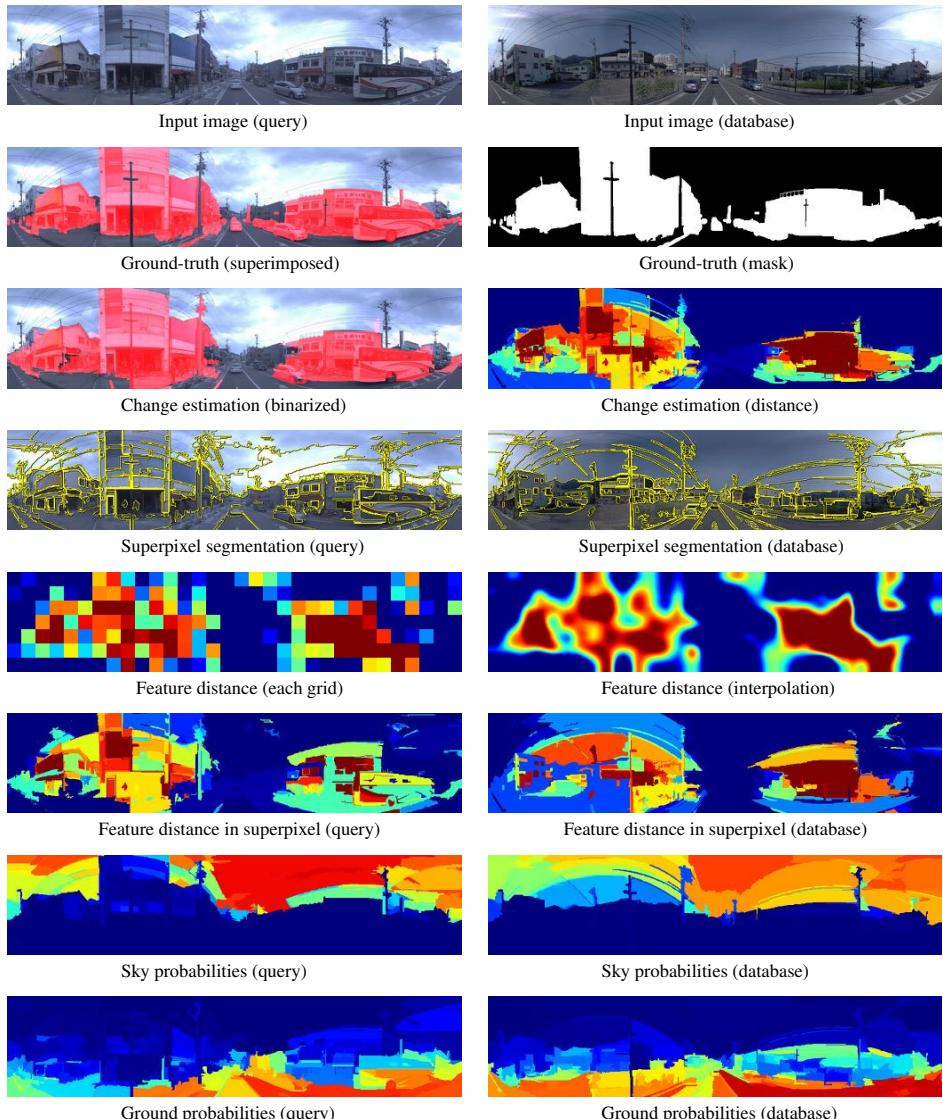


Figure 35: Results of change detection using pool-5 feature of CNN (Frame No. 35/100 in change detection dataset of tsunami)

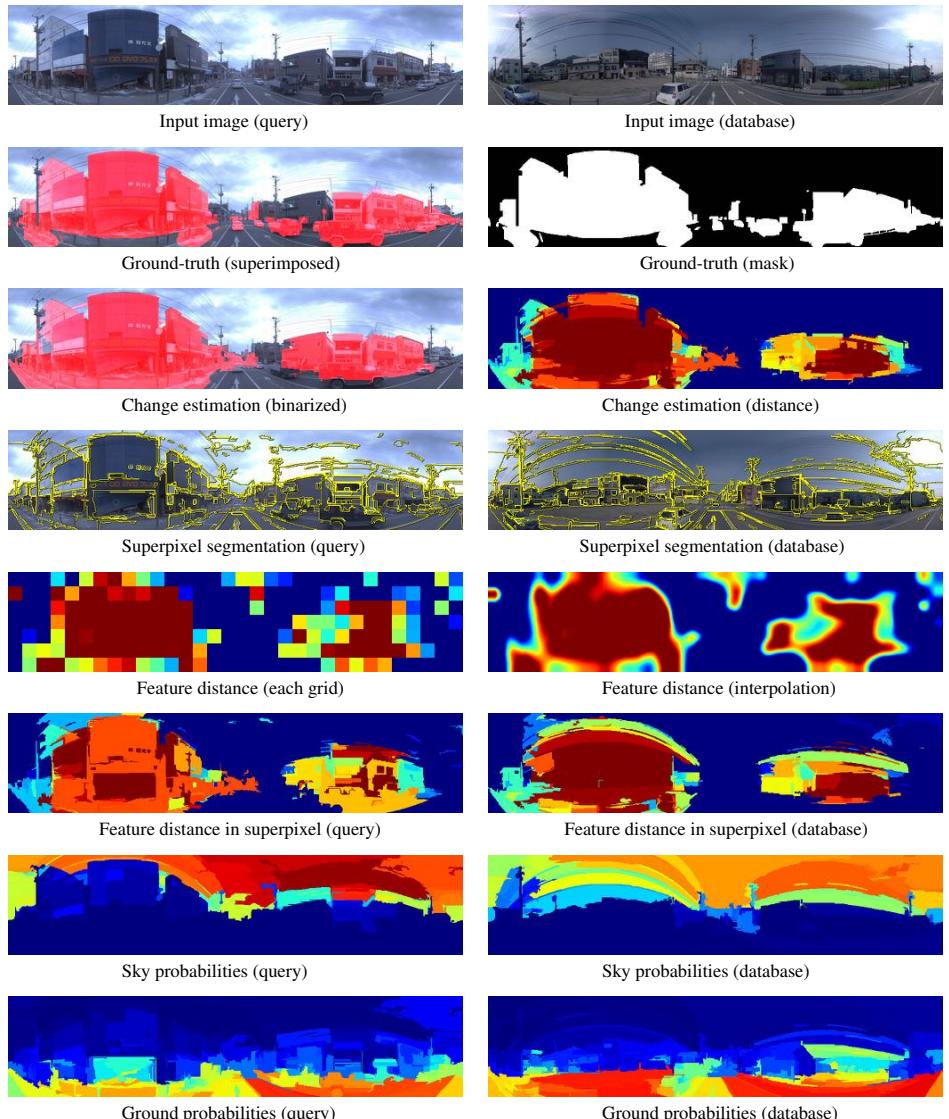


Figure 36: Results of change detection using pool-5 feature of CNN (Frame No. 36/100 in change detection dataset of tsunami)

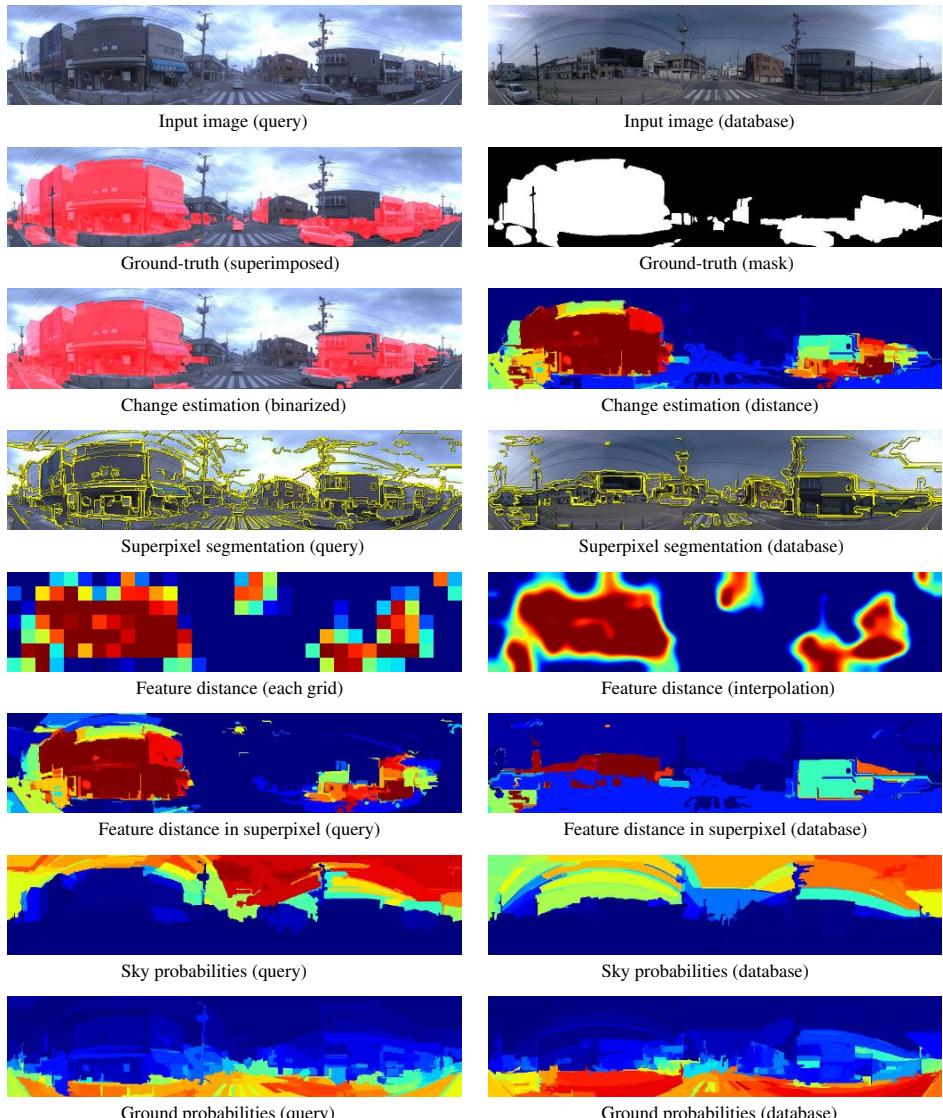


Figure 37: Results of change detection using pool-5 feature of CNN (Frame No. 37/100 in change detection dataset of tsunami)

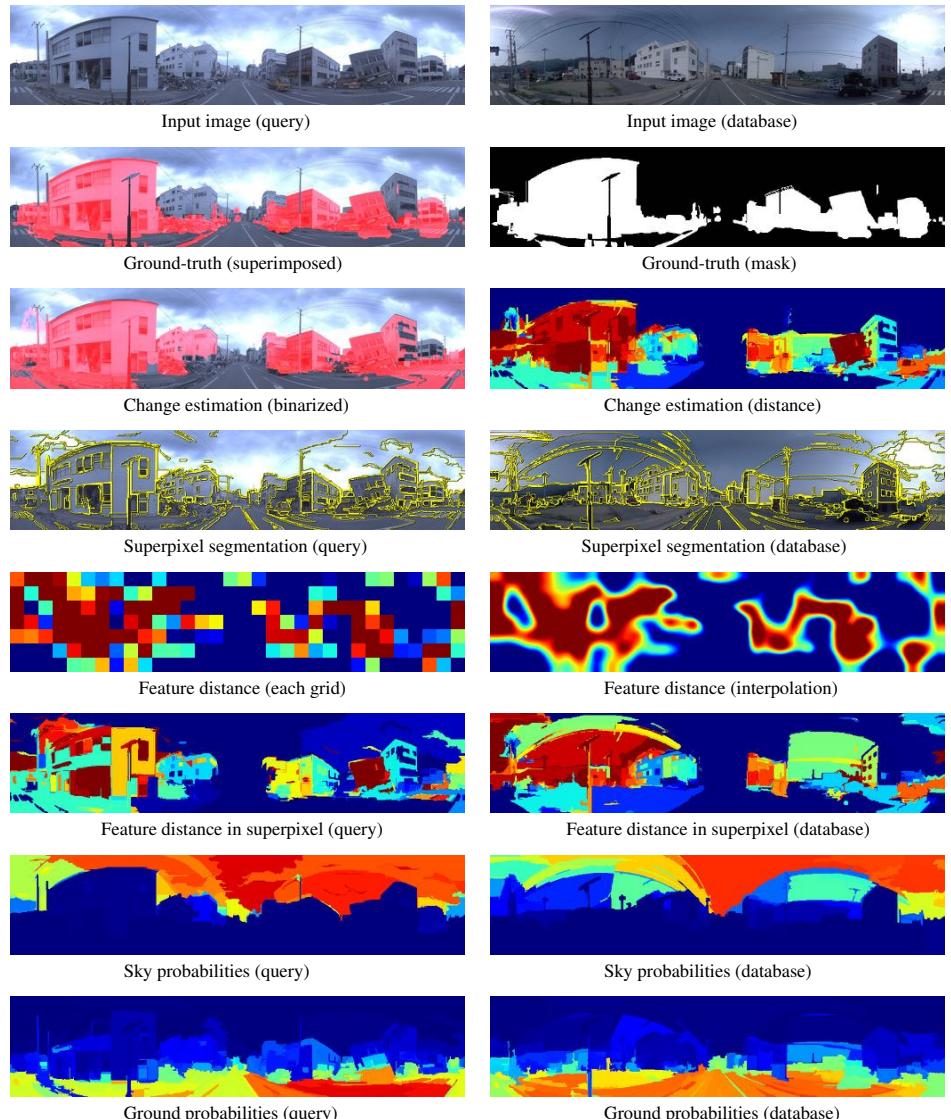


Figure 38: Results of change detection using pool-5 feature of CNN (Frame No. 38/100 in change detection dataset of tsunami)

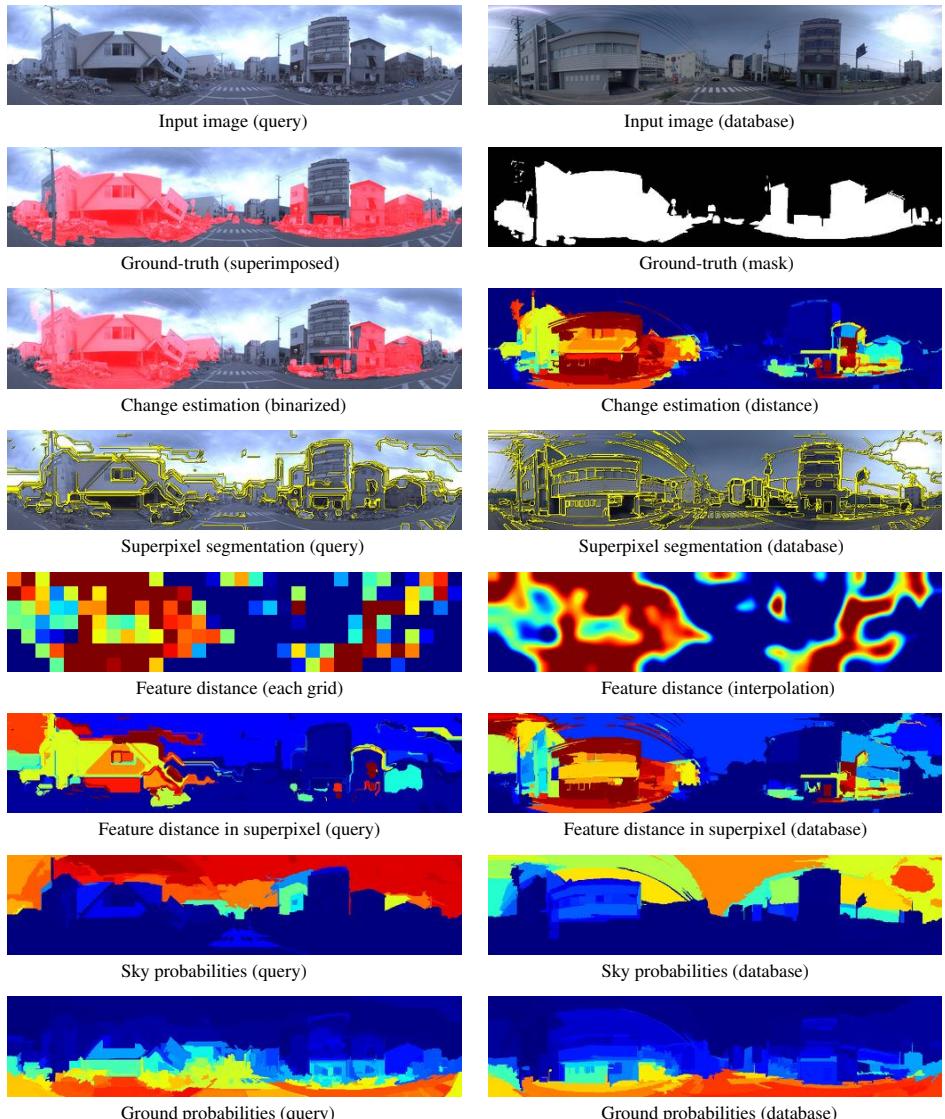


Figure 39: Results of change detection using pool-5 feature of CNN (Frame No. 39/100 in change detection dataset of tsunami)

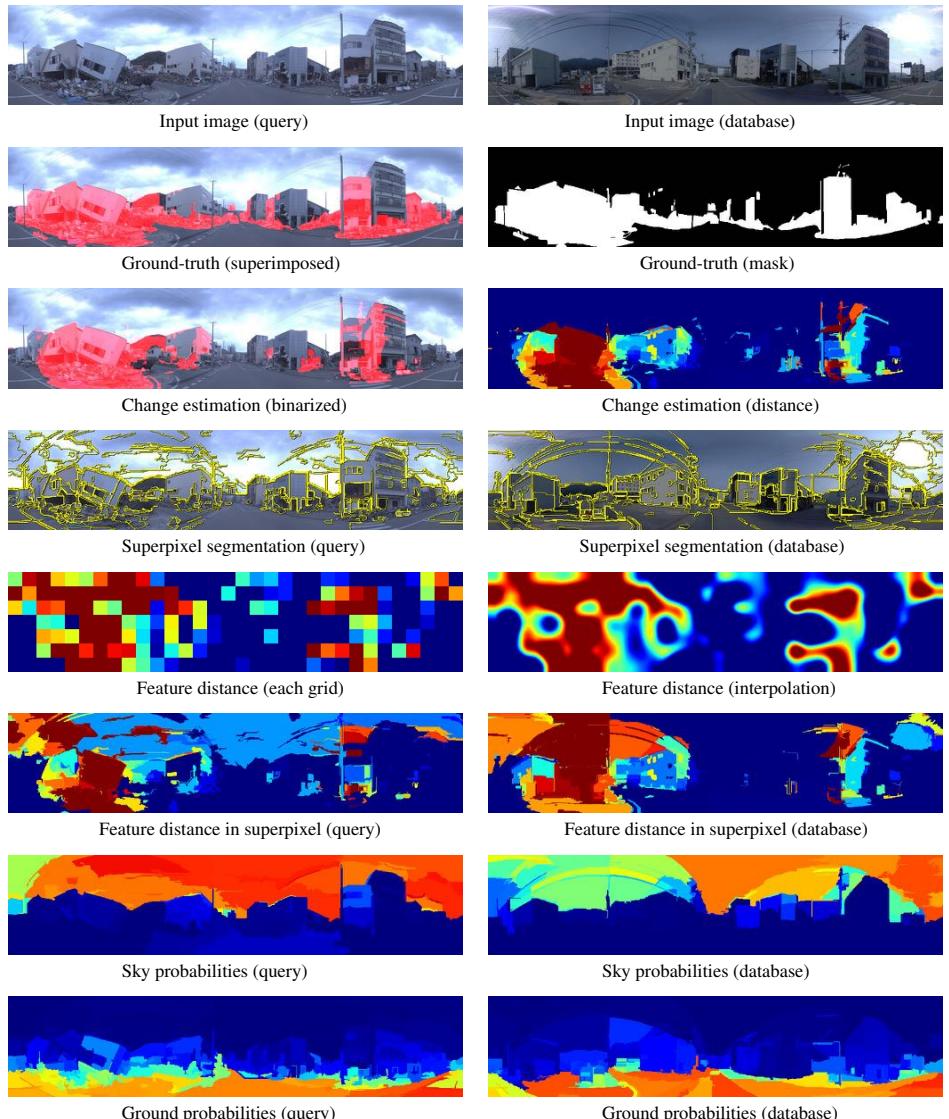


Figure 40: Results of change detection using pool-5 feature of CNN (Frame No. 40/100 in change detection dataset of tsunami)

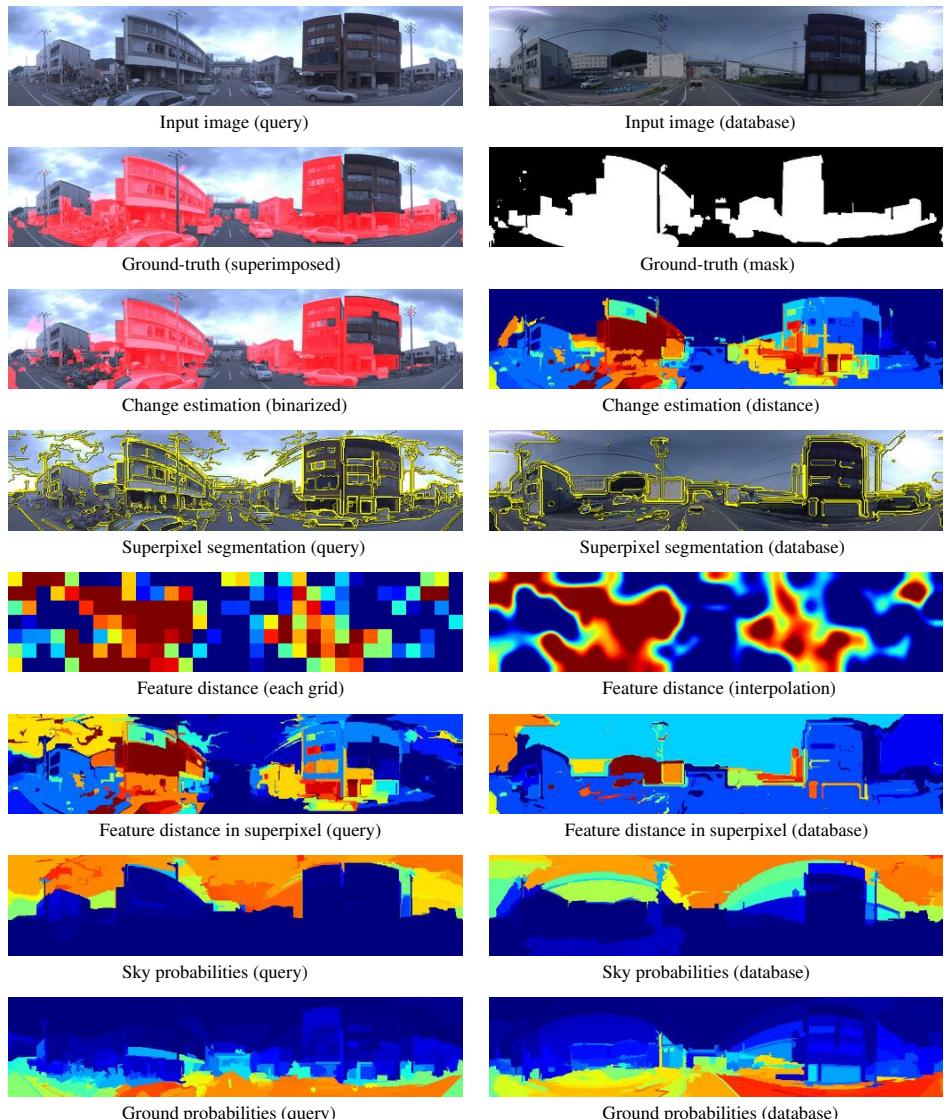


Figure 41: Results of change detection using pool-5 feature of CNN (Frame No. 41/100 in change detection dataset of tsunami)

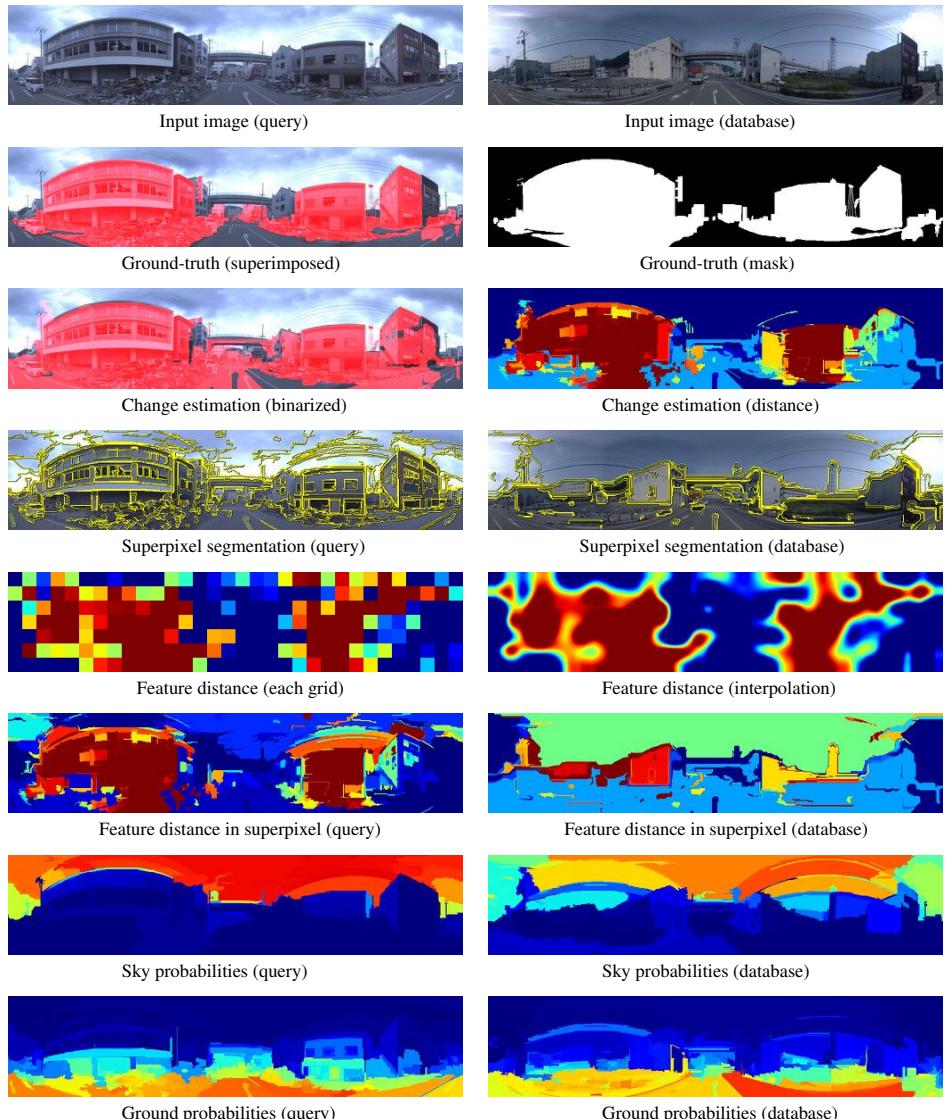


Figure 42: Results of change detection using pool-5 feature of CNN (Frame No. 42/100 in change detection dataset of tsunami)

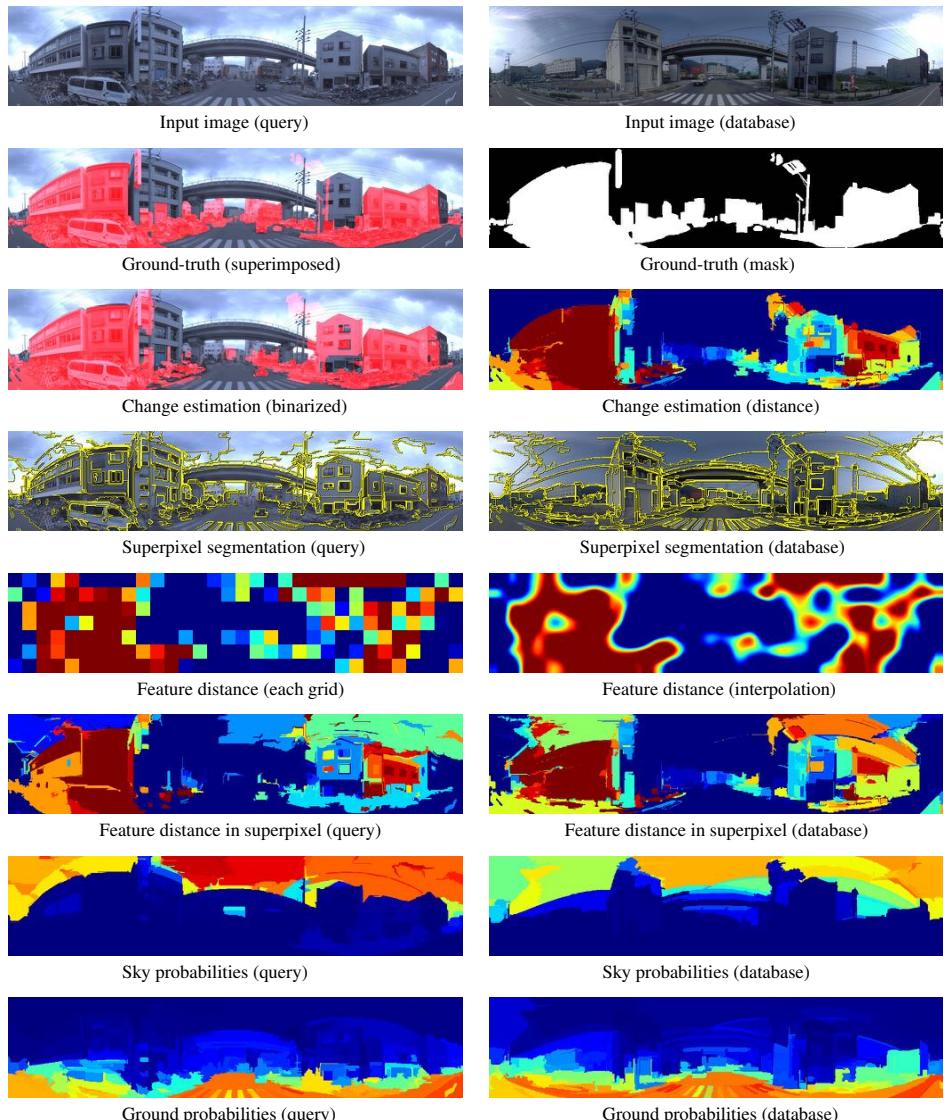


Figure 43: Results of change detection using pool-5 feature of CNN (Frame No. 43/100 in change detection dataset of tsunami)

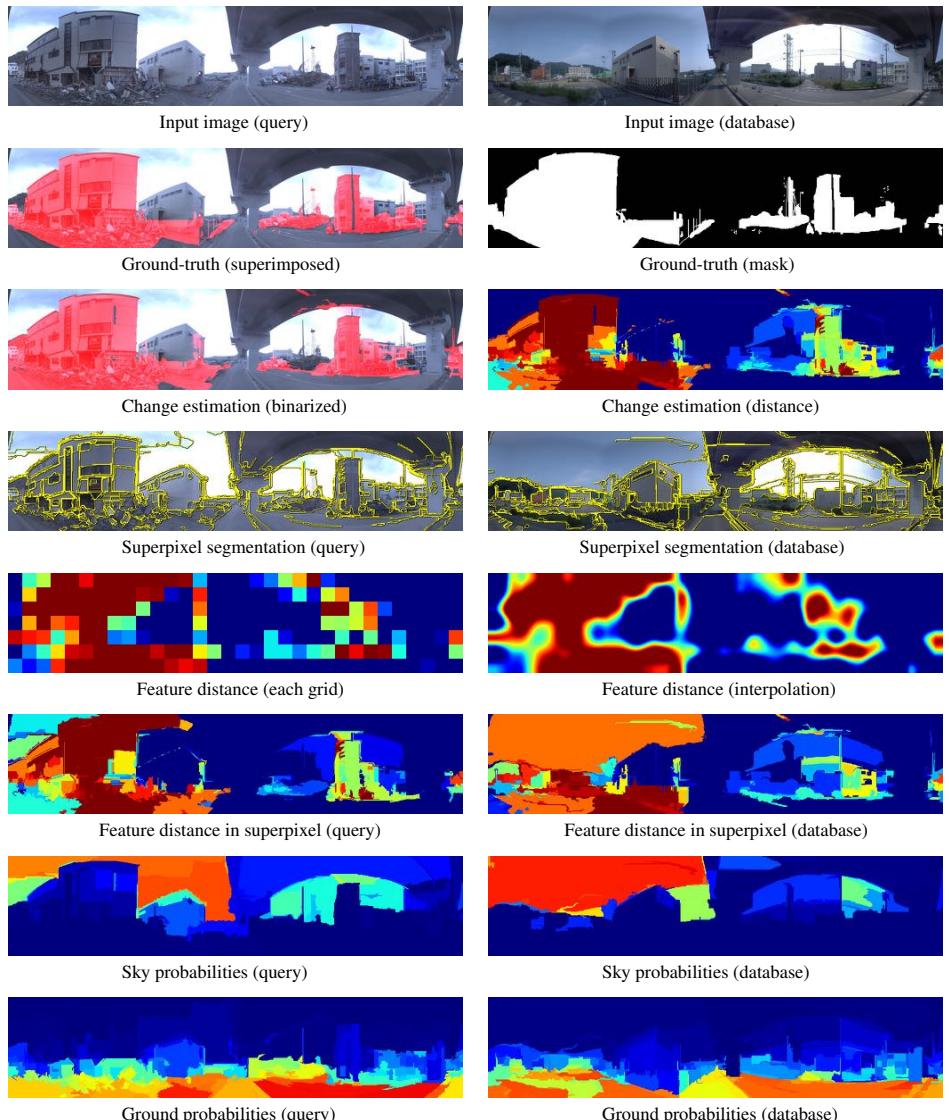


Figure 44: Results of change detection using pool-5 feature of CNN (Frame No. 44/100 in change detection dataset of tsunami)

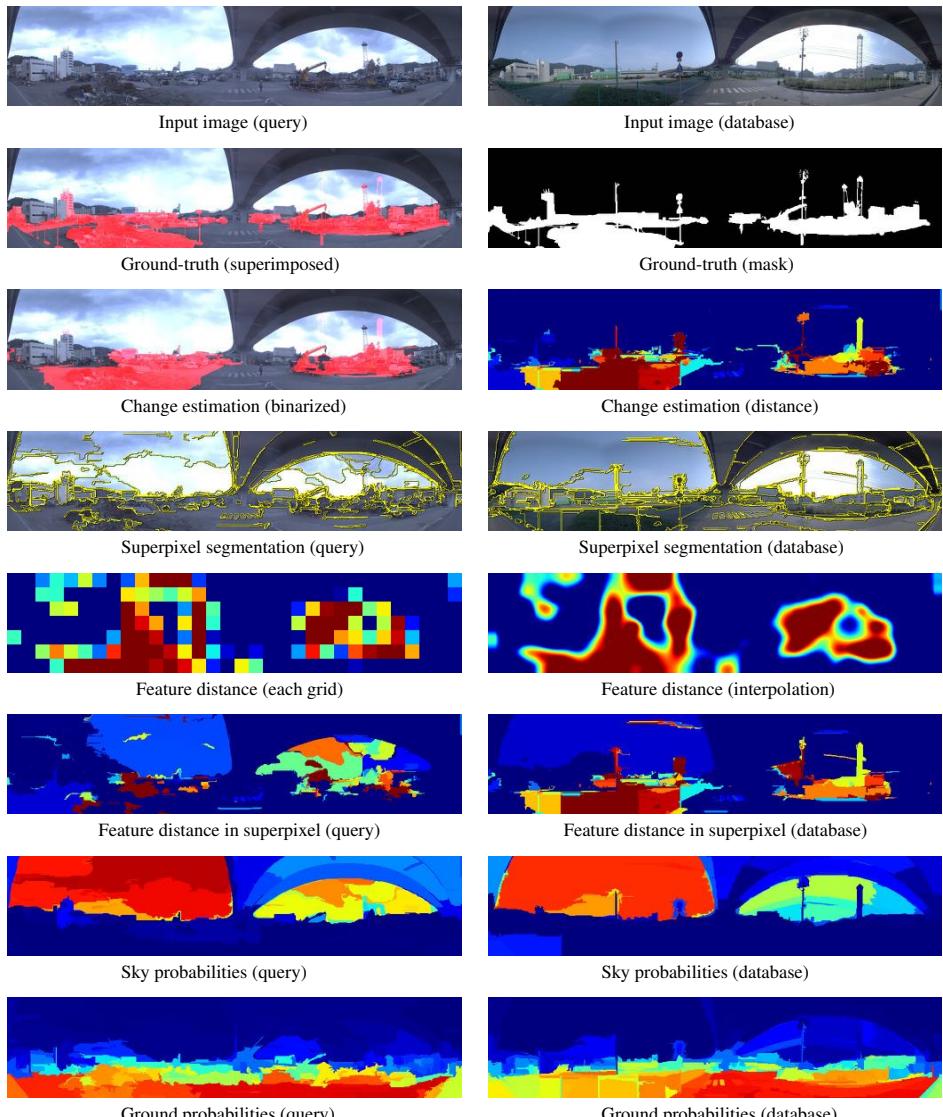


Figure 45: Results of change detection using pool-5 feature of CNN (Frame No. 45/100 in change detection dataset of tsunami)

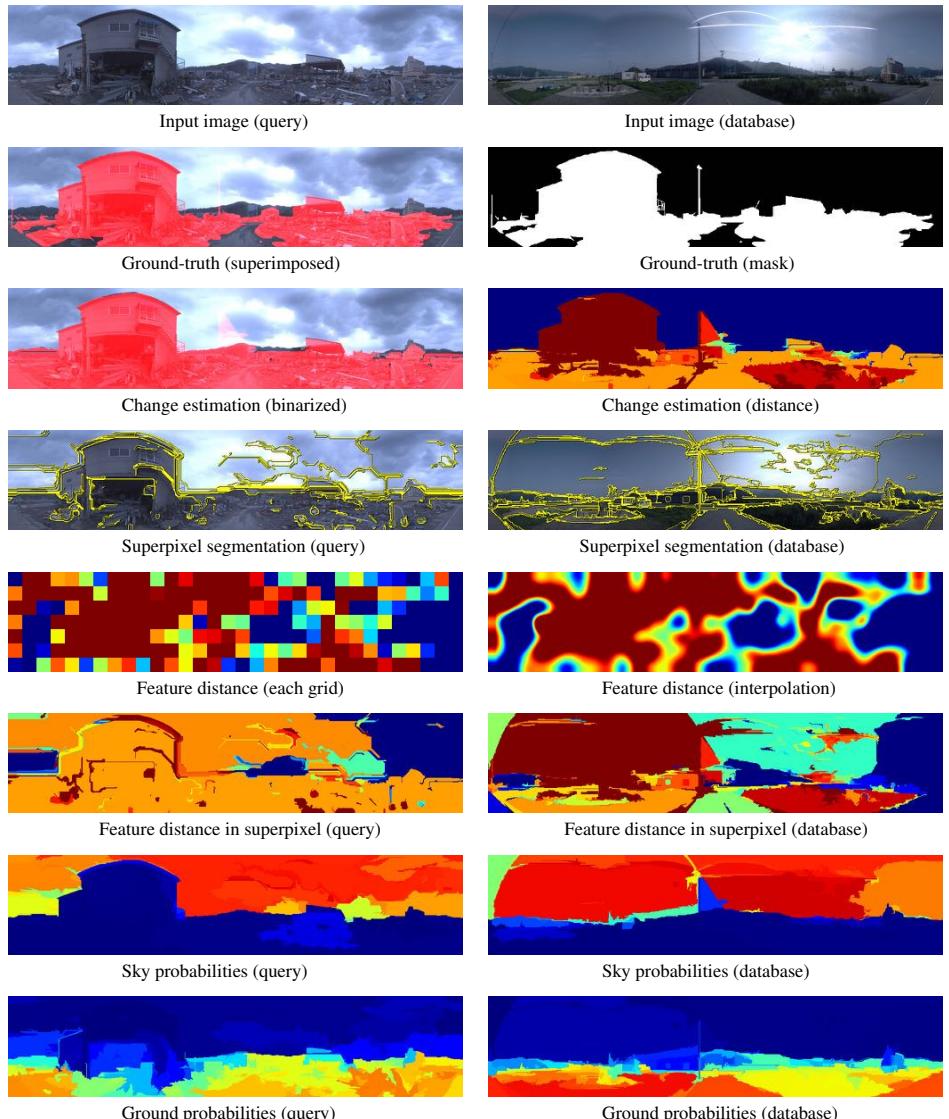


Figure 46: Results of change detection using pool-5 feature of CNN (Frame No. 46/100 in change detection dataset of tsunami)

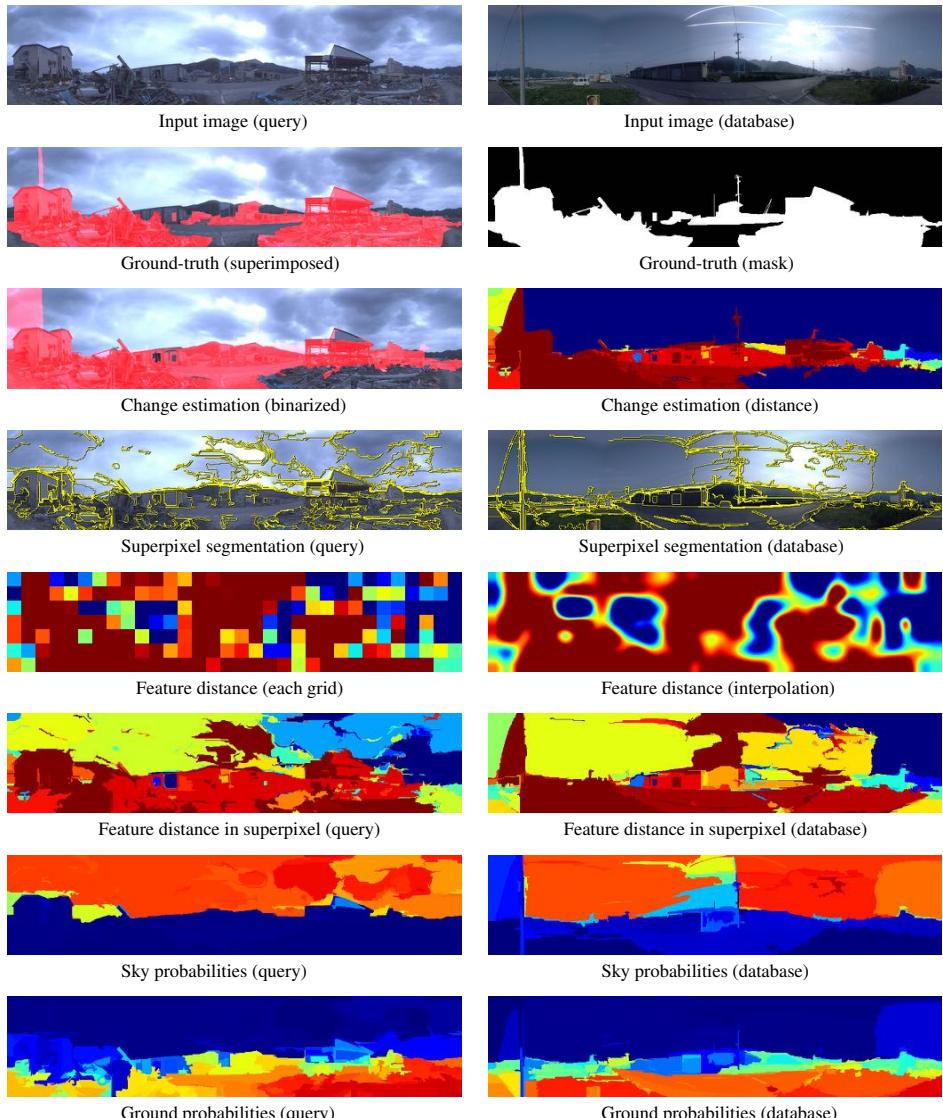


Figure 47: Results of change detection using pool-5 feature of CNN (Frame No. 47/100 in change detection dataset of tsunami)

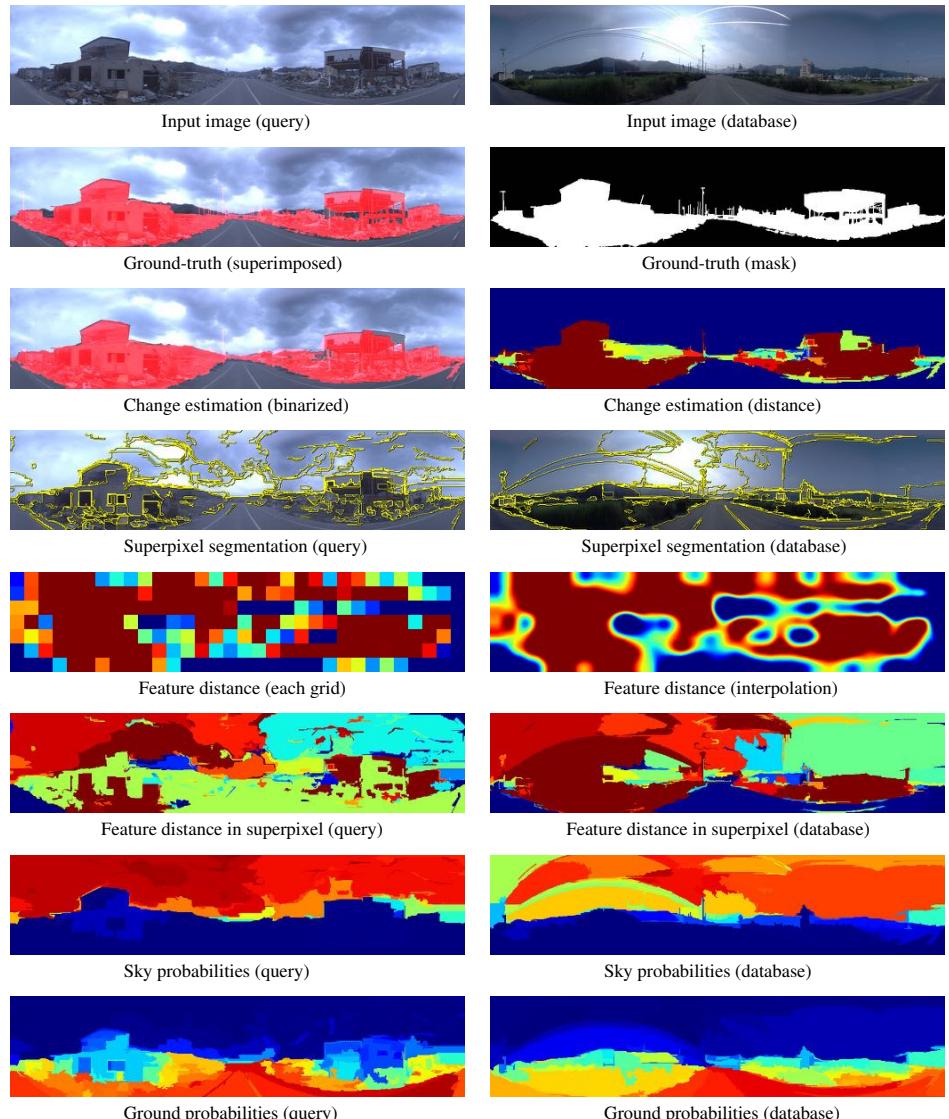


Figure 48: Results of change detection using pool-5 feature of CNN (Frame No. 48/100 in change detection dataset of tsunami)

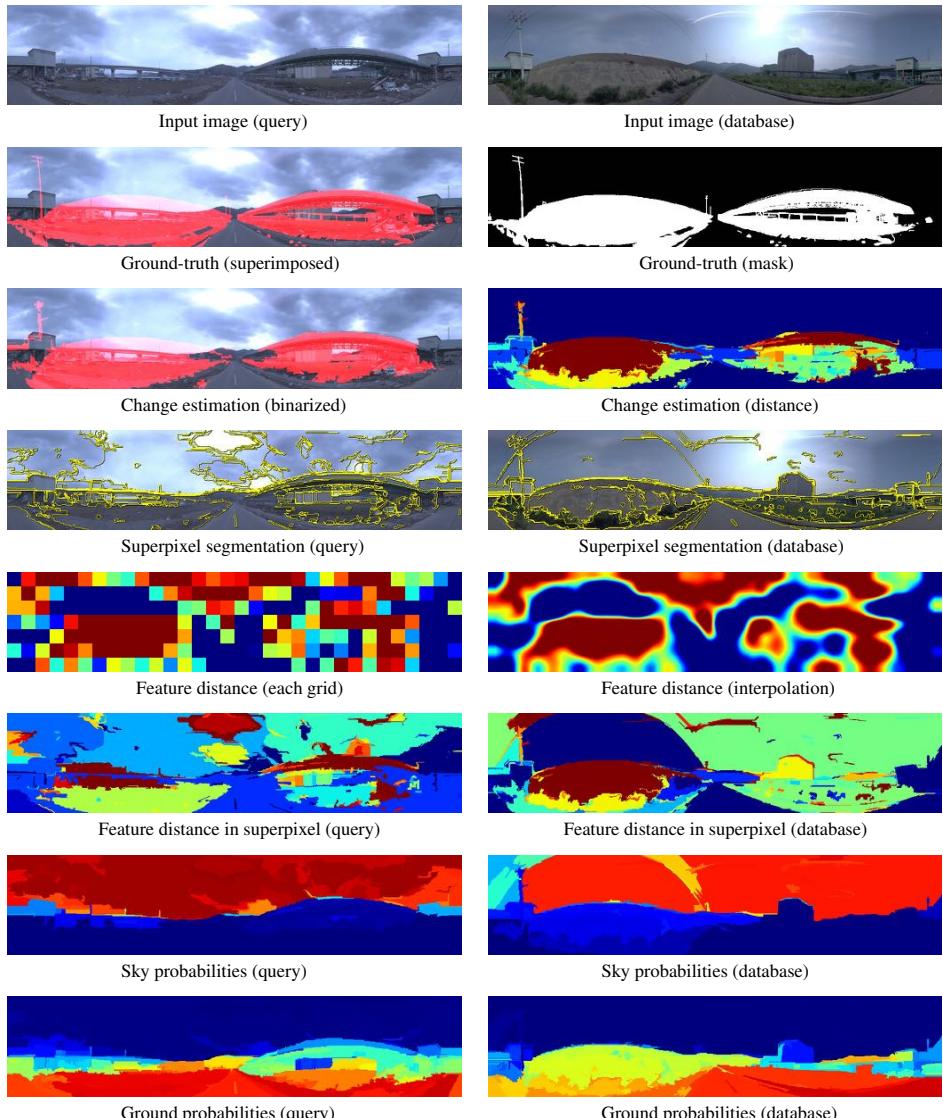


Figure 49: Results of change detection using pool-5 feature of CNN (Frame No. 49/100 in change detection dataset of tsunami)

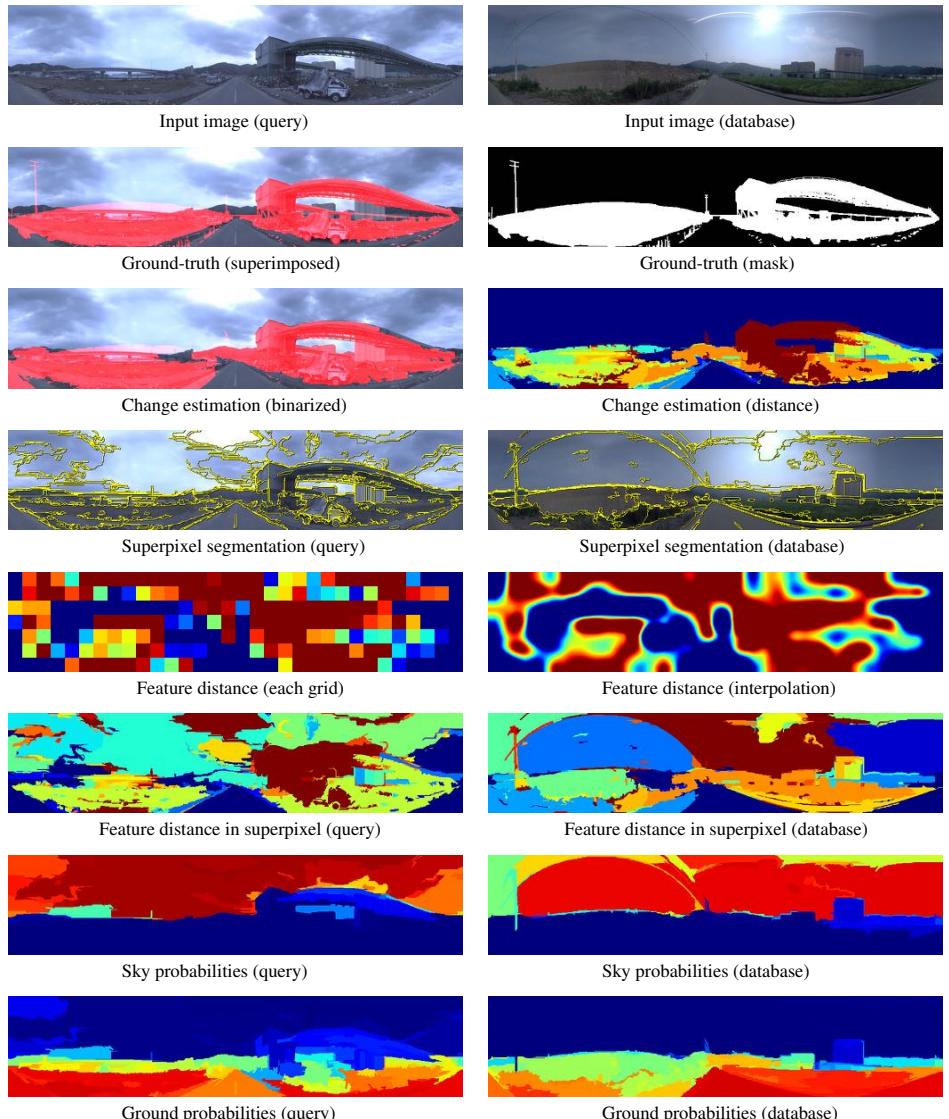


Figure 50: Results of change detection using pool-5 feature of CNN (Frame No. 50/100 in change detection dataset of tsunami)

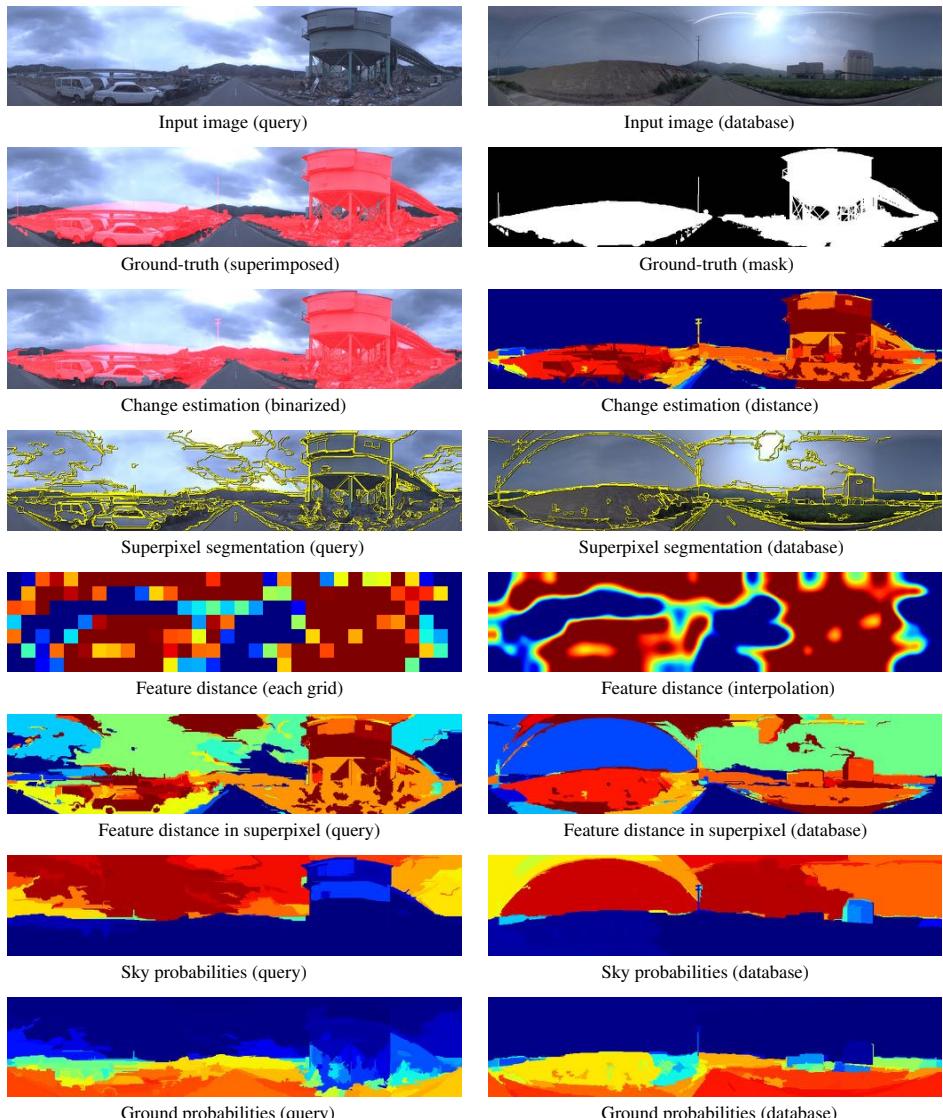


Figure 51: Results of change detection using pool-5 feature of CNN (Frame No. 51/100 in change detection dataset of tsunami)

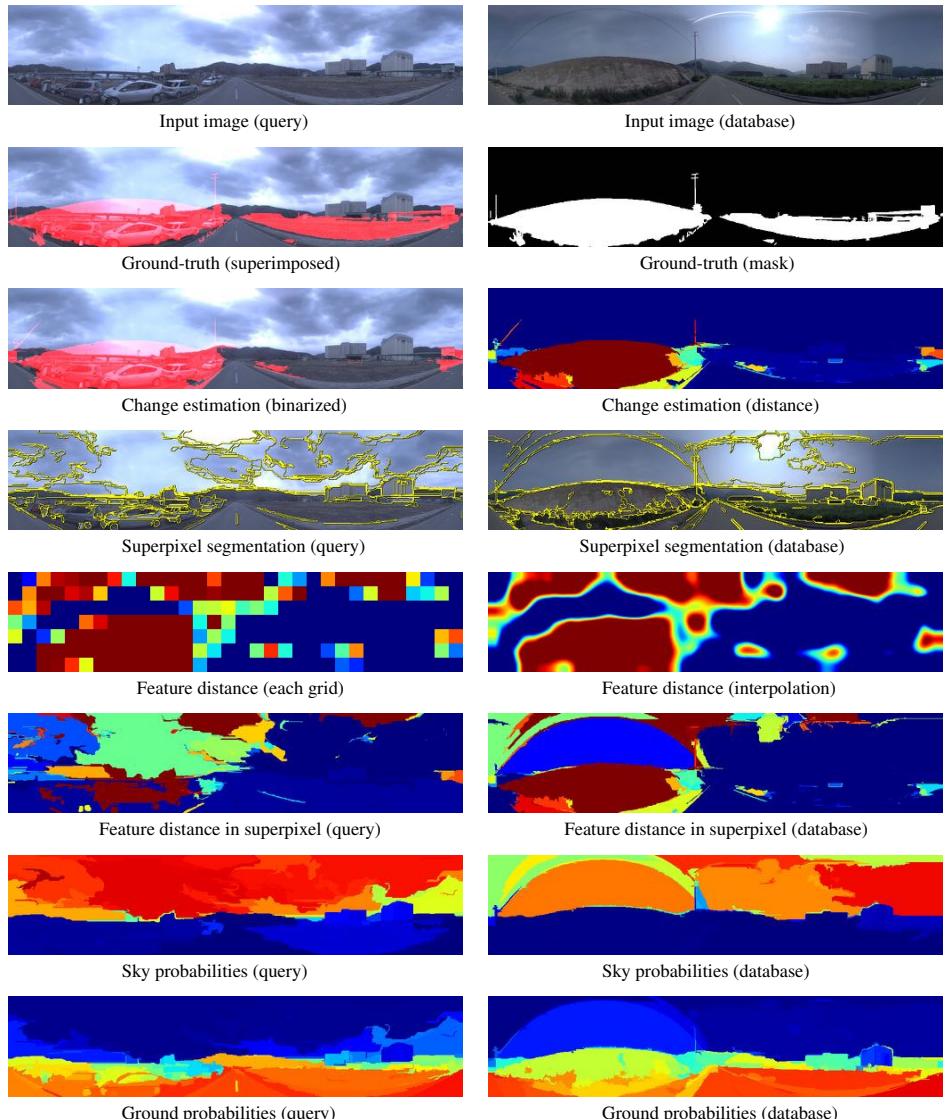


Figure 52: Results of change detection using pool-5 feature of CNN (Frame No. 52/100 in change detection dataset of tsunami)

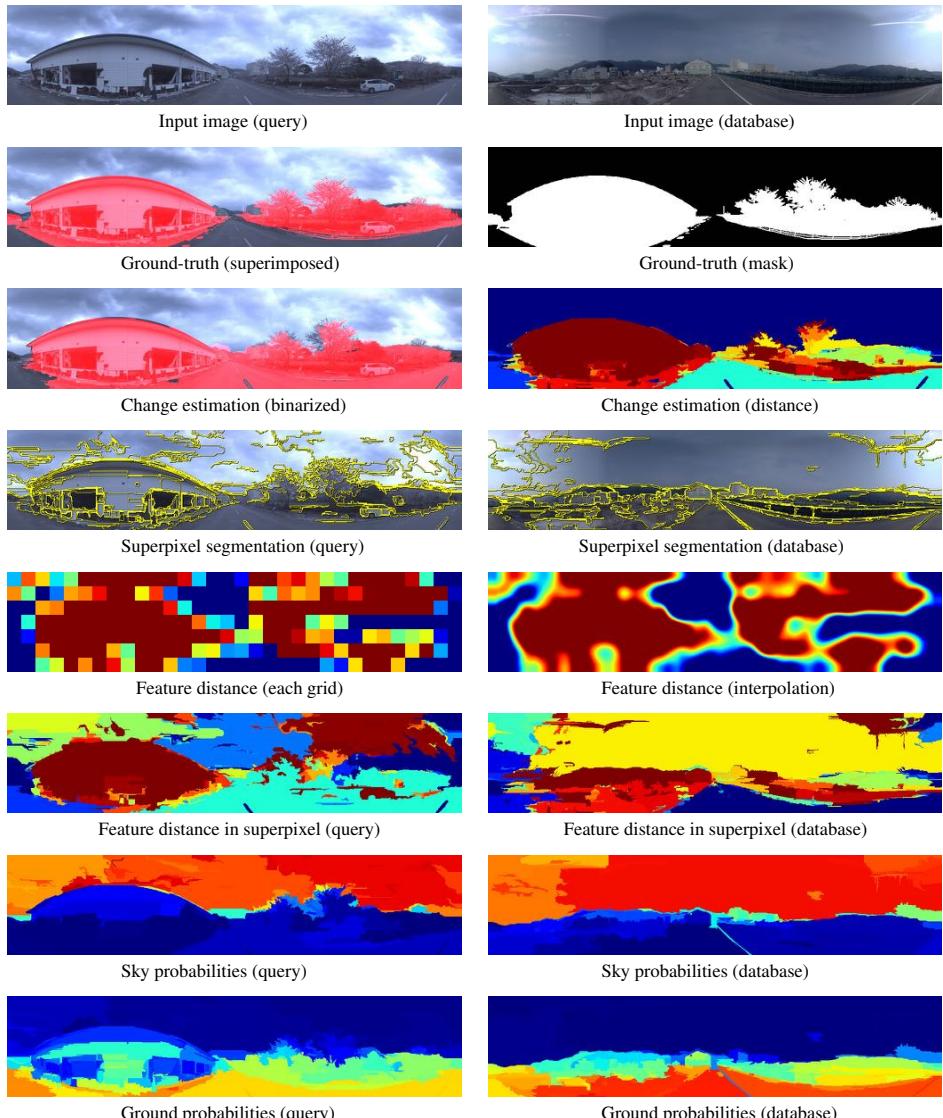


Figure 53: Results of change detection using pool-5 feature of CNN (Frame No. 53/100 in change detection dataset of tsunami)

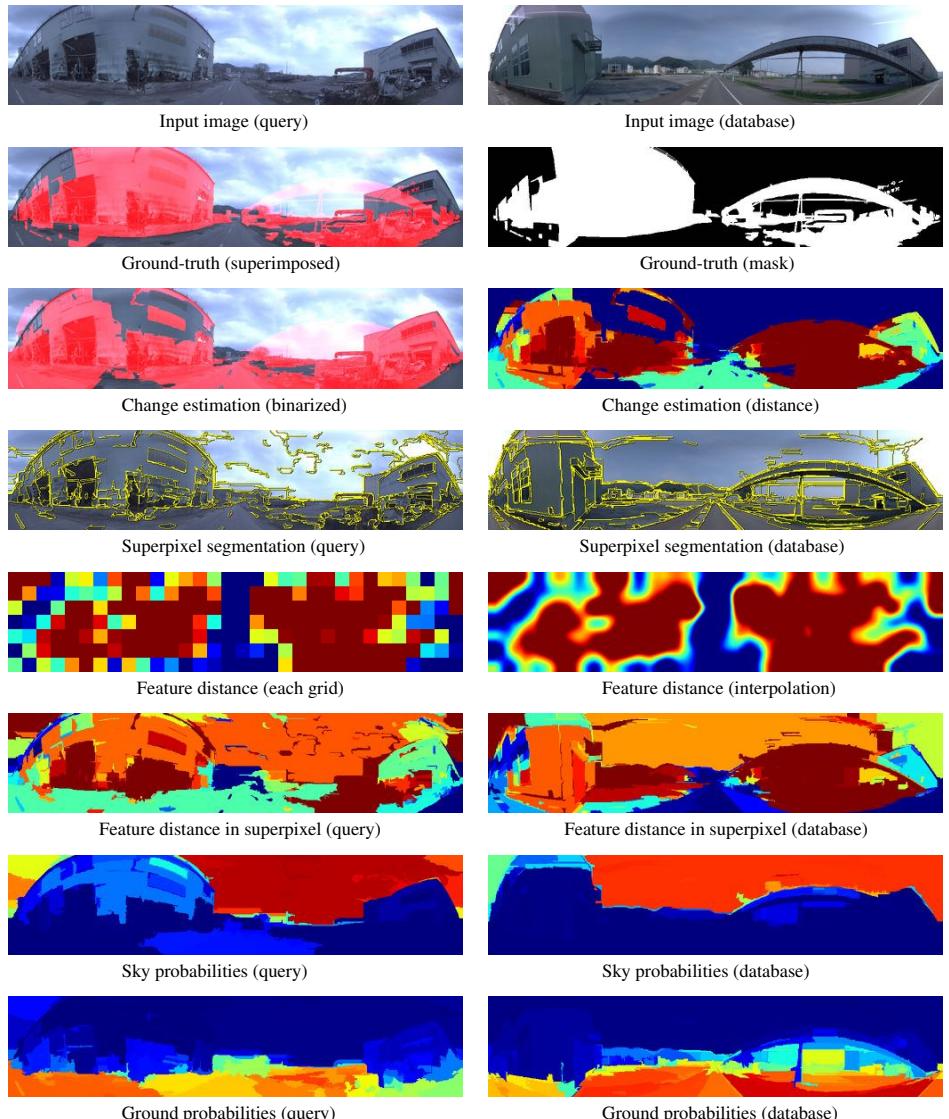


Figure 54: Results of change detection using pool-5 feature of CNN (Frame No. 54/100 in change detection dataset of tsunami)

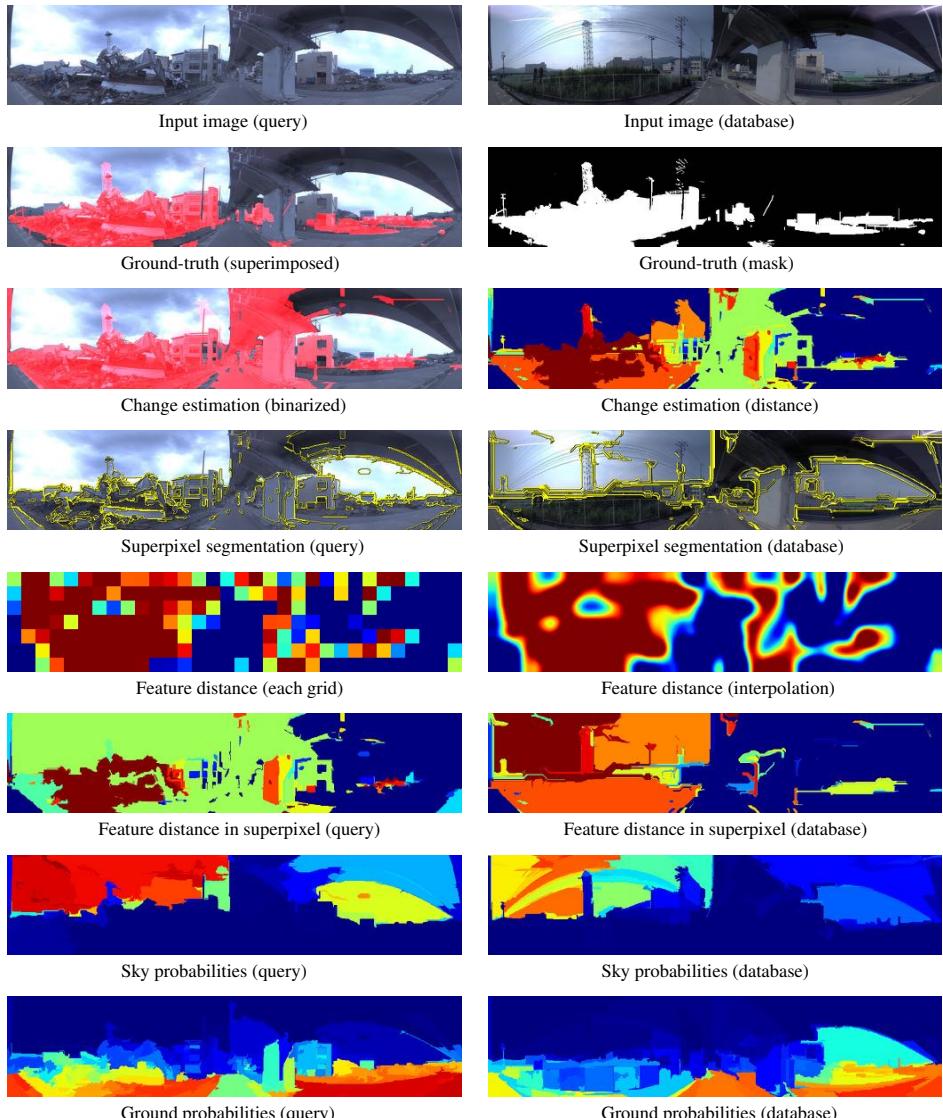


Figure 55: Results of change detection using pool-5 feature of CNN (Frame No. 55/100 in change detection dataset of tsunami)

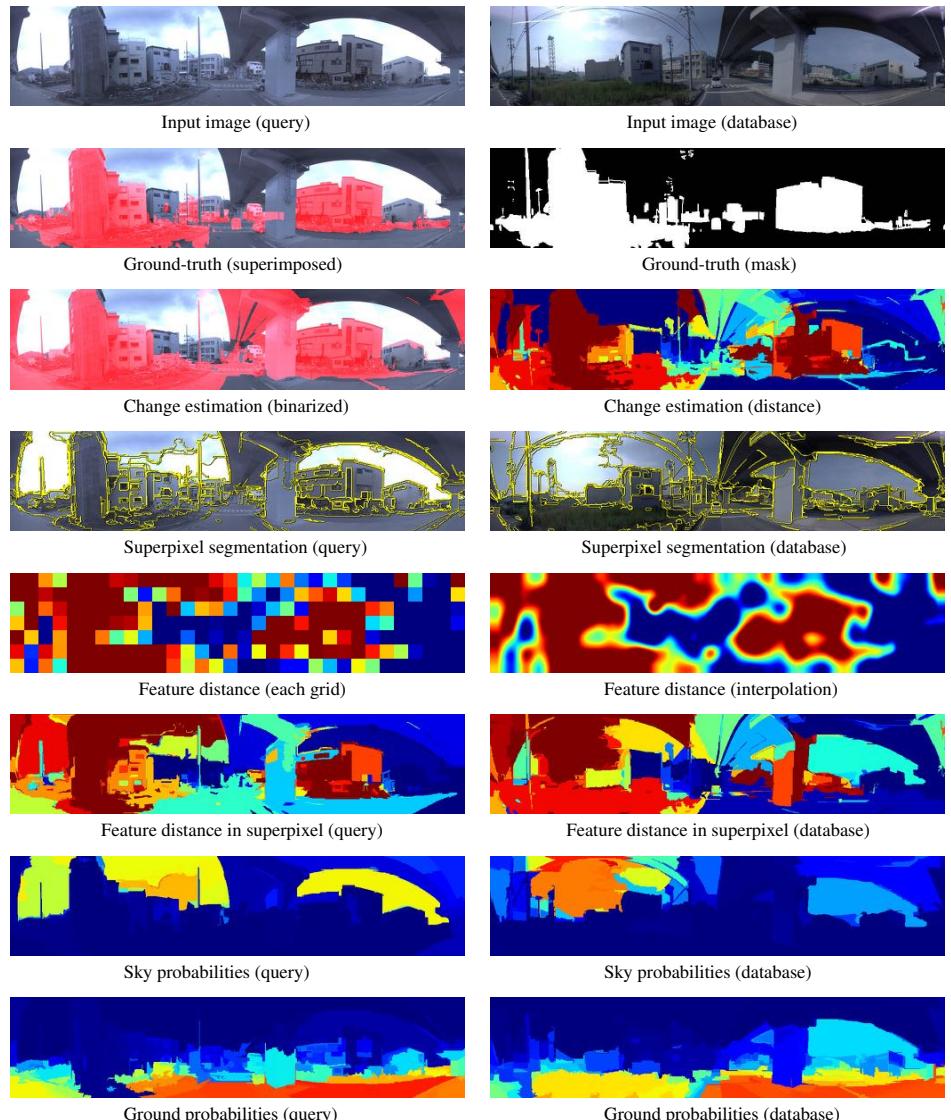


Figure 56: Results of change detection using pool-5 feature of CNN (Frame No. 56/100 in change detection dataset of tsunami)

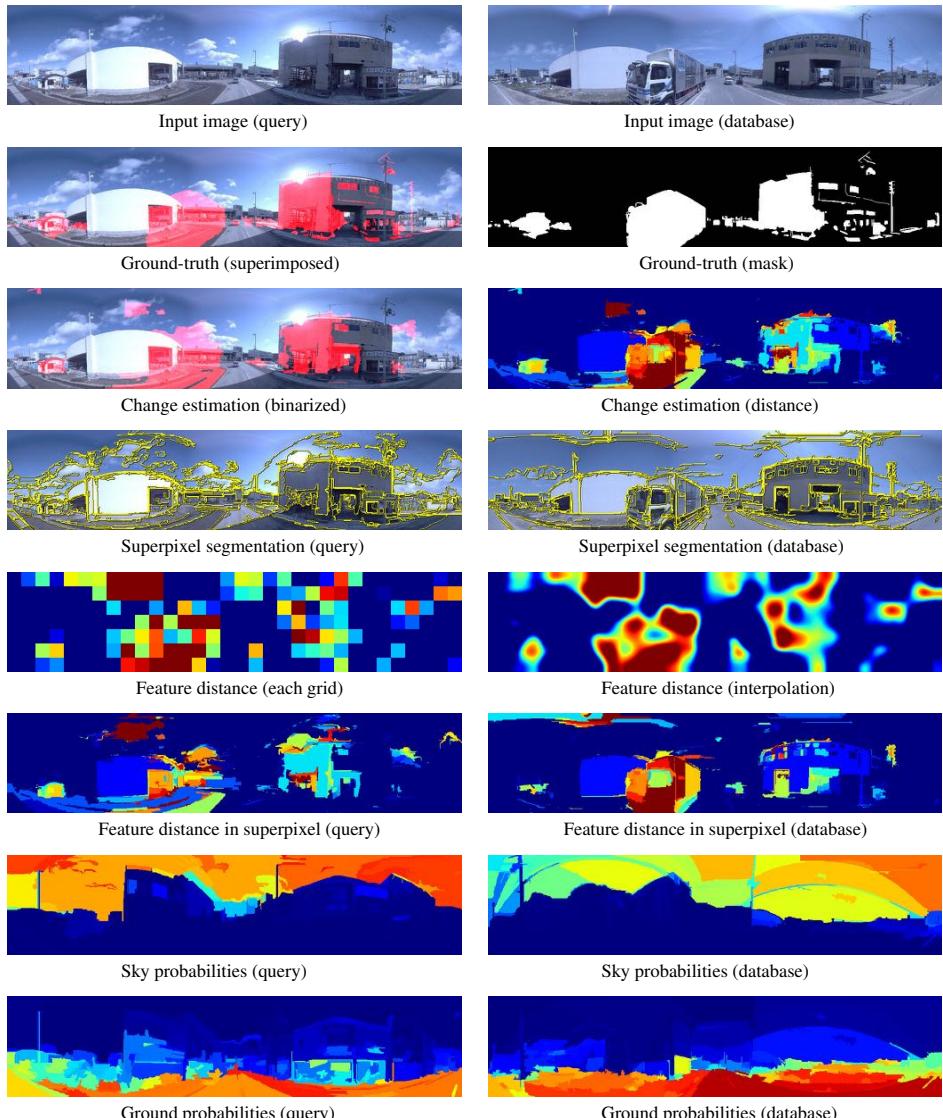


Figure 57: Results of change detection using pool-5 feature of CNN (Frame No. 57/100 in change detection dataset of tsunami)

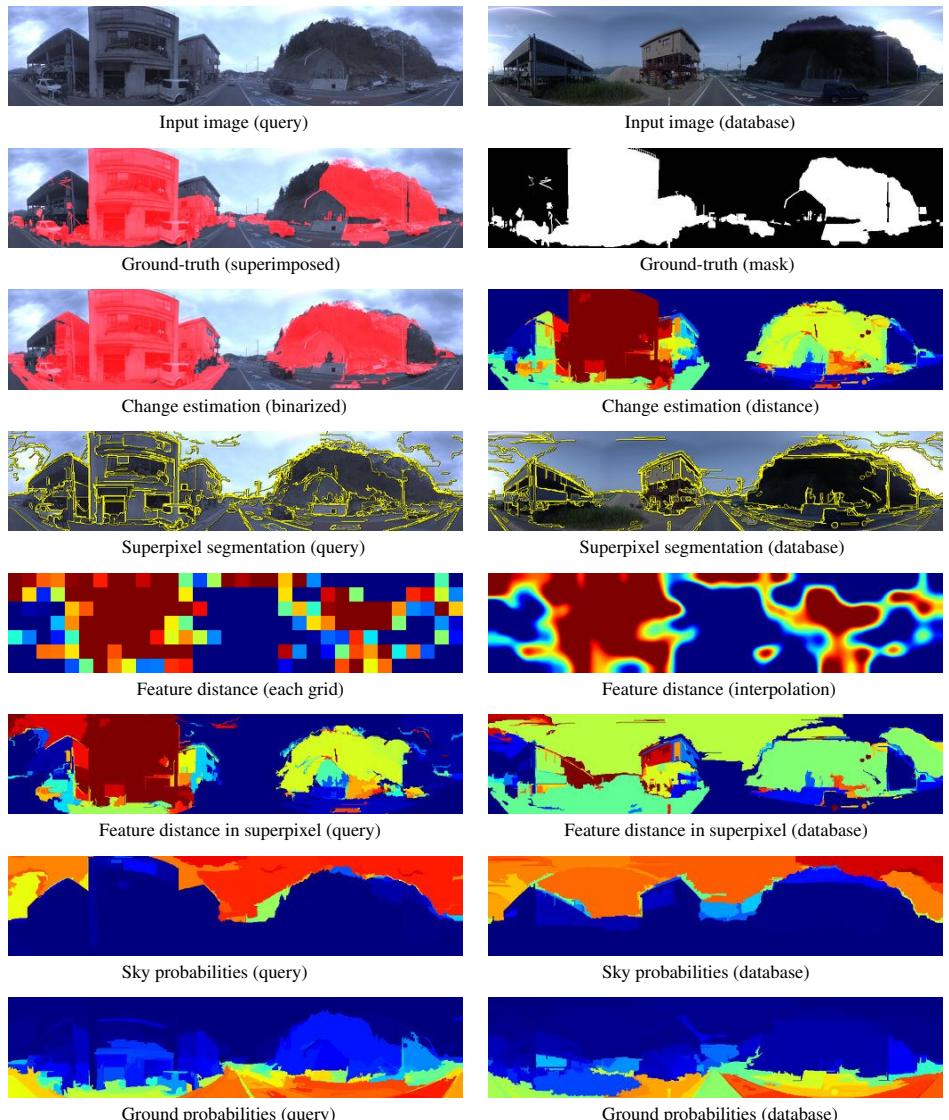


Figure 58: Results of change detection using pool-5 feature of CNN (Frame No. 58/100 in change detection dataset of tsunami)

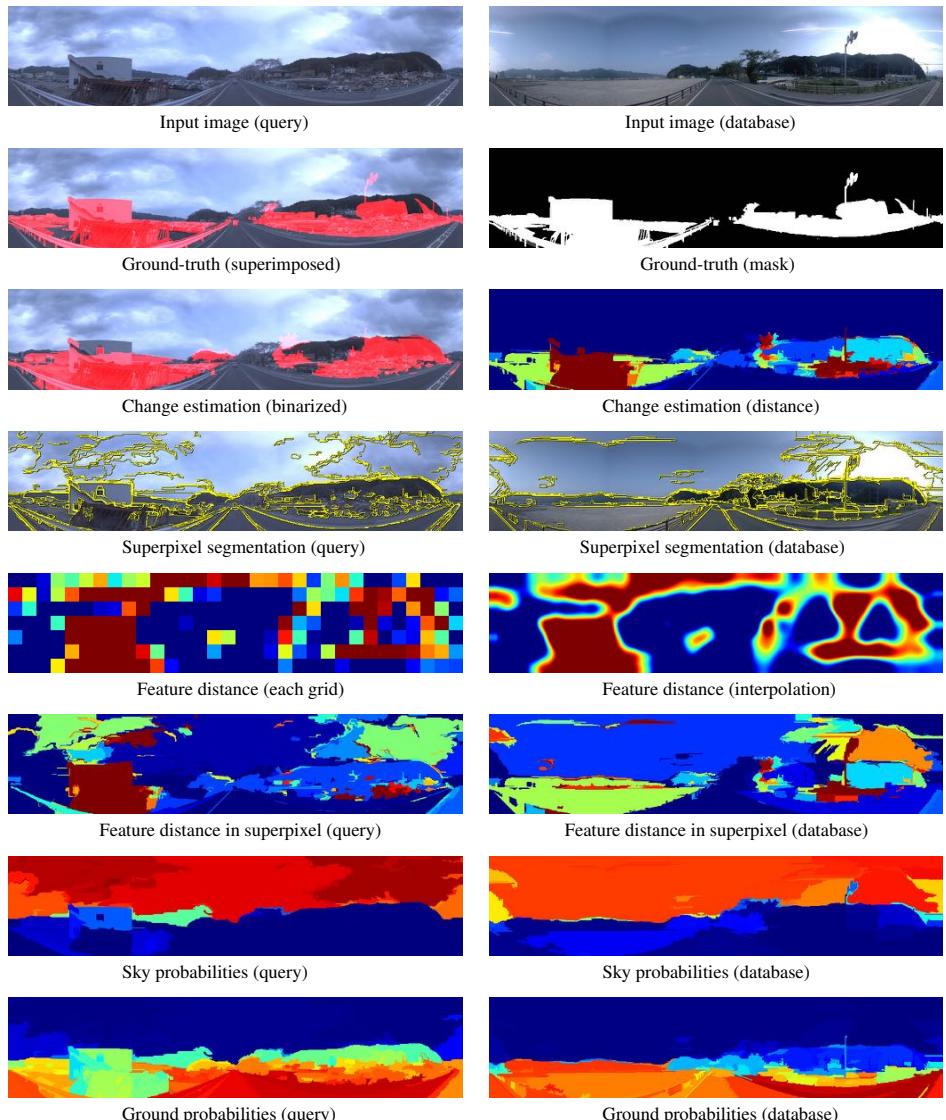


Figure 59: Results of change detection using pool-5 feature of CNN (Frame No. 59/100 in change detection dataset of tsunami)

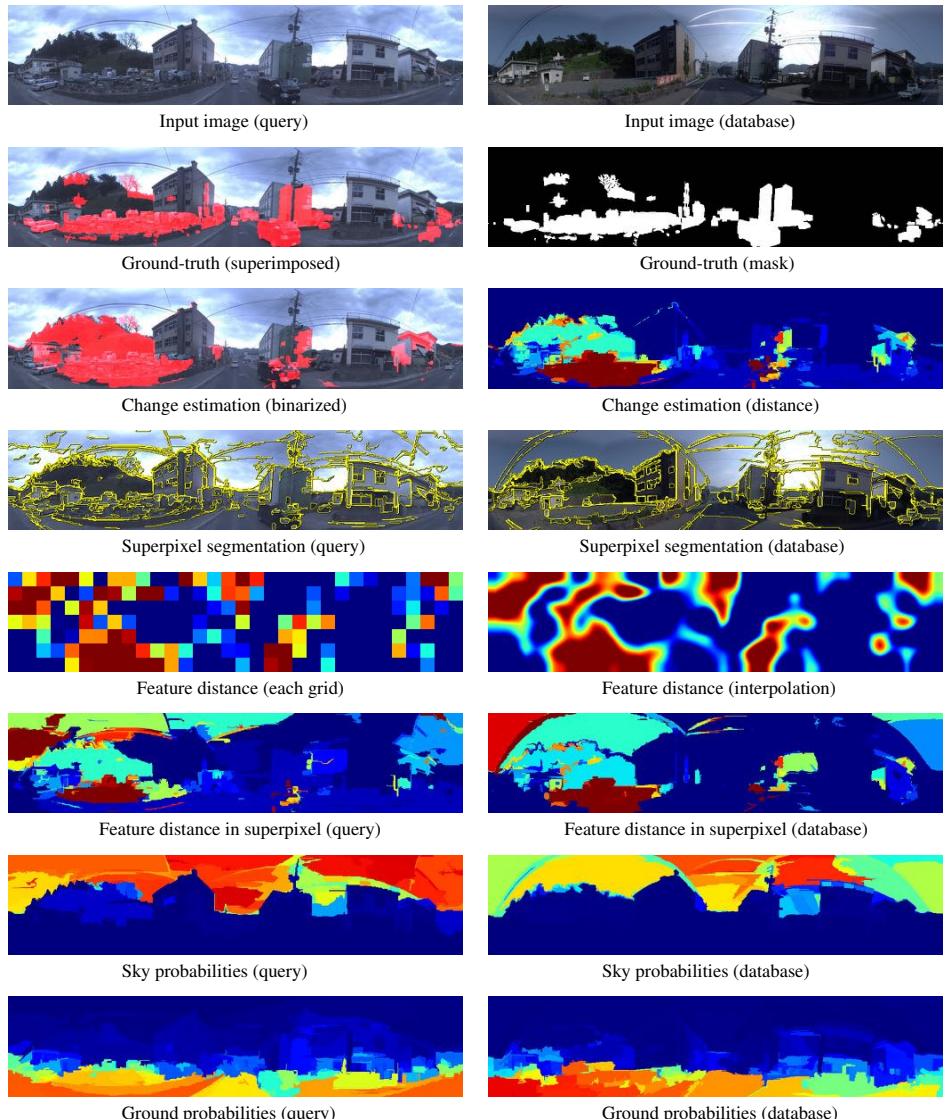


Figure 60: Results of change detection using pool-5 feature of CNN (Frame No. 60/100 in change detection dataset of tsunami)

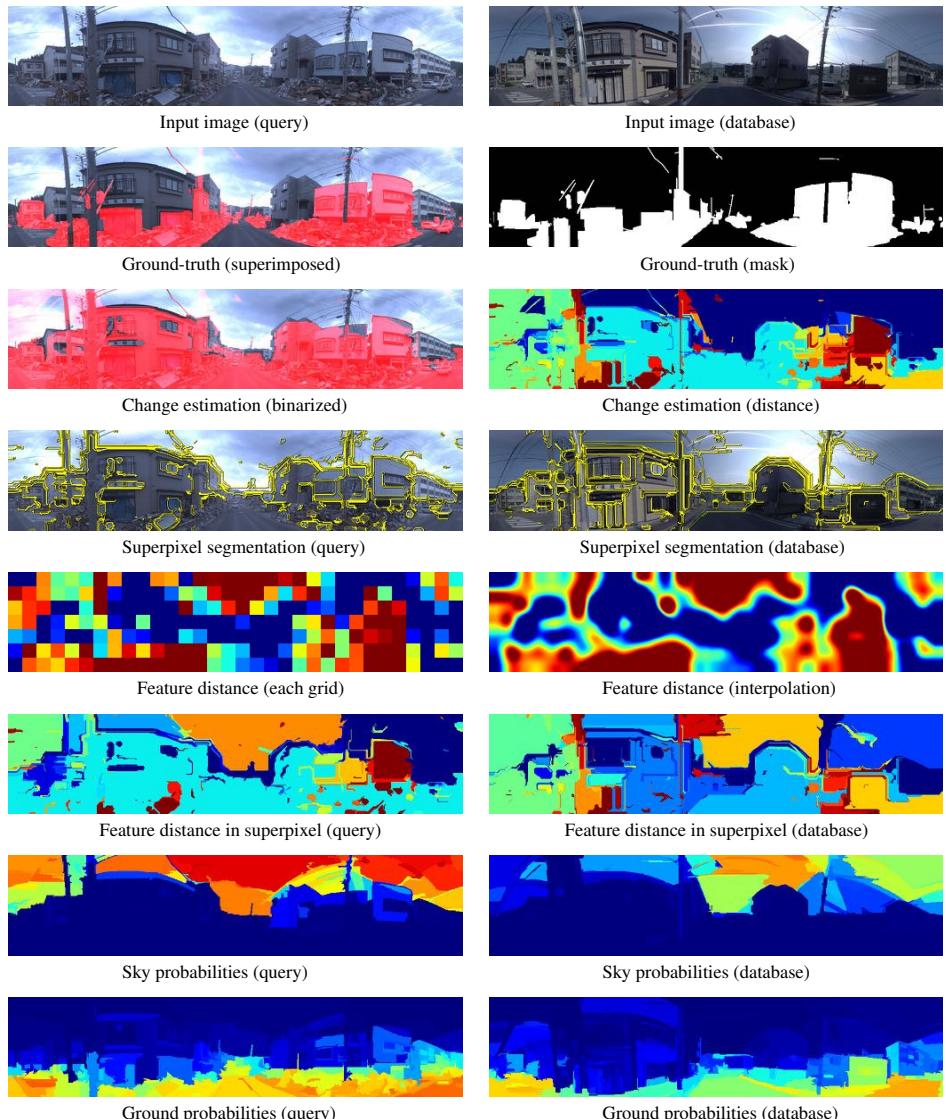


Figure 61: Results of change detection using pool-5 feature of CNN (Frame No. 61/100 in change detection dataset of tsunami)

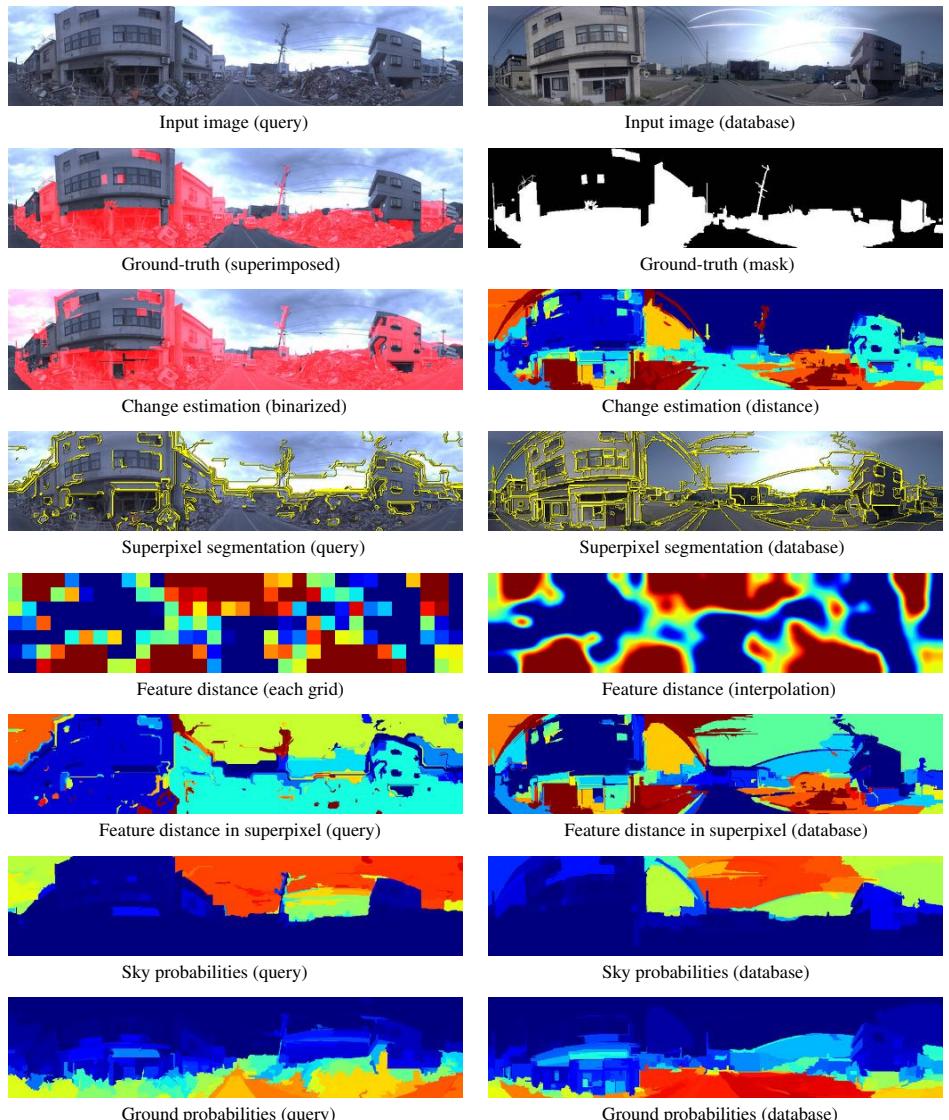


Figure 62: Results of change detection using pool-5 feature of CNN (Frame No. 62/100 in change detection dataset of tsunami)

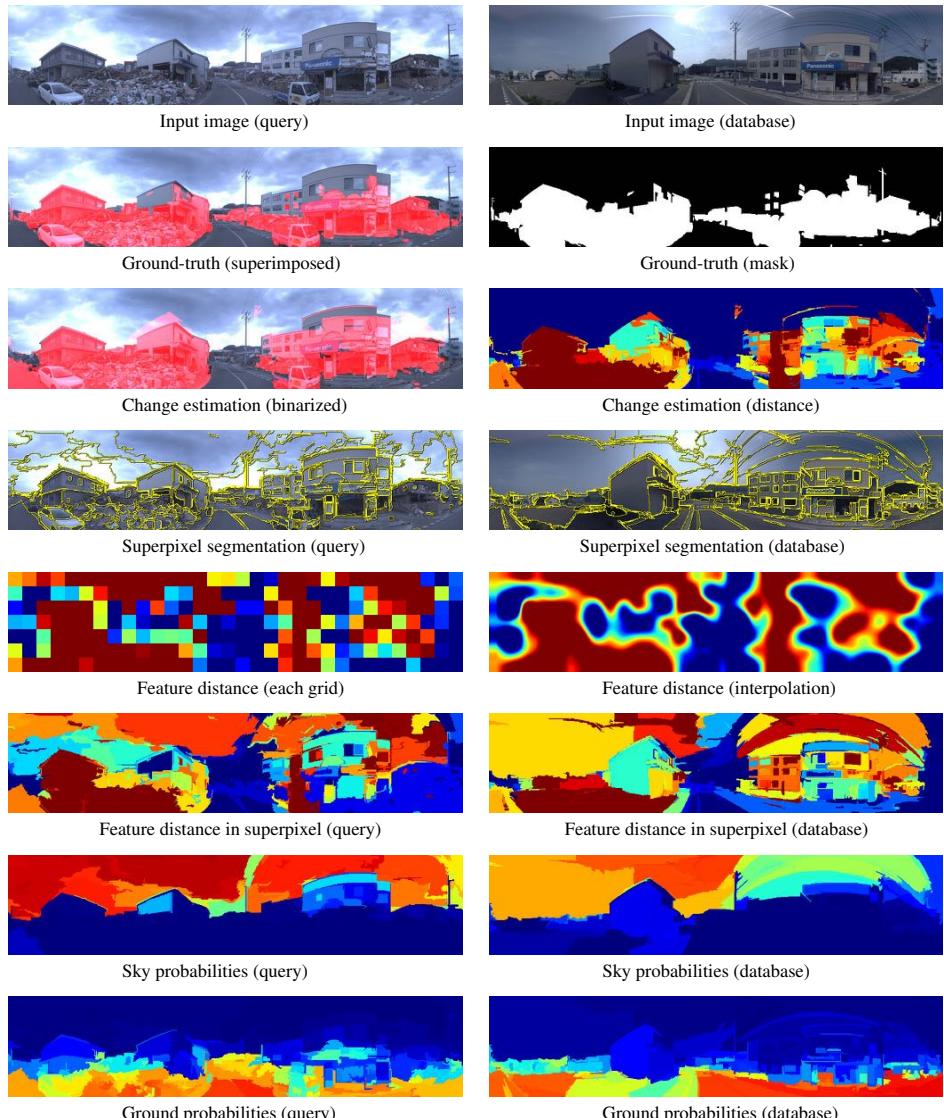


Figure 63: Results of change detection using pool-5 feature of CNN (Frame No. 63/100 in change detection dataset of tsunami)

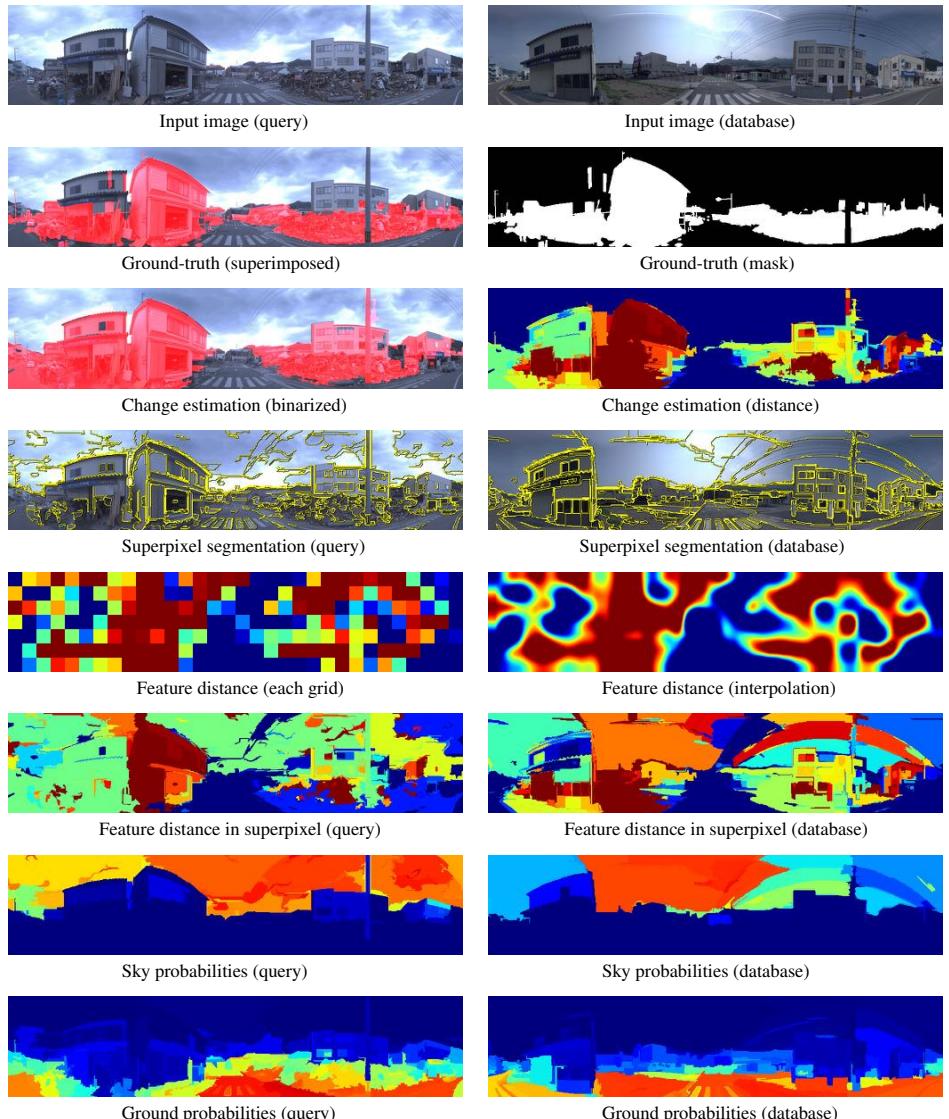


Figure 64: Results of change detection using pool-5 feature of CNN (Frame No. 64/100 in change detection dataset of tsunami)

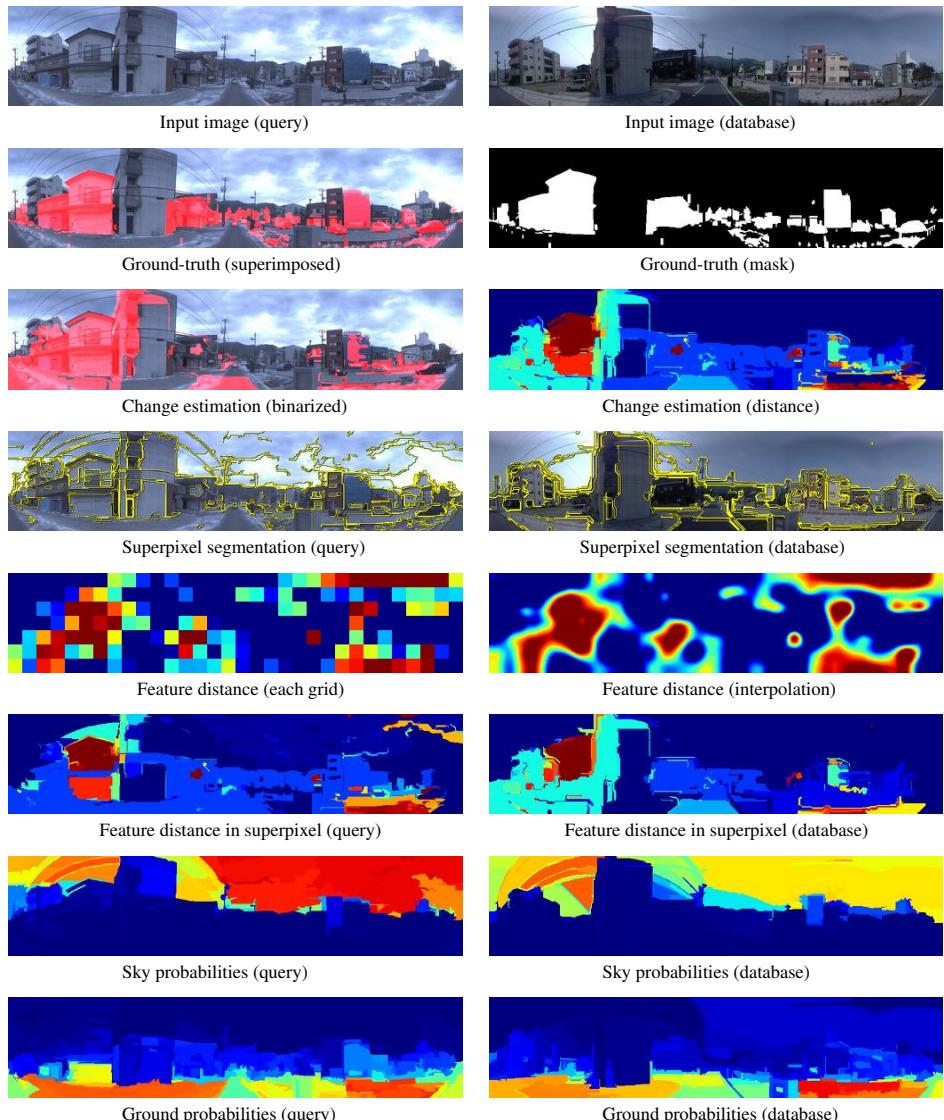


Figure 65: Results of change detection using pool-5 feature of CNN (Frame No. 65/100 in change detection dataset of tsunami)

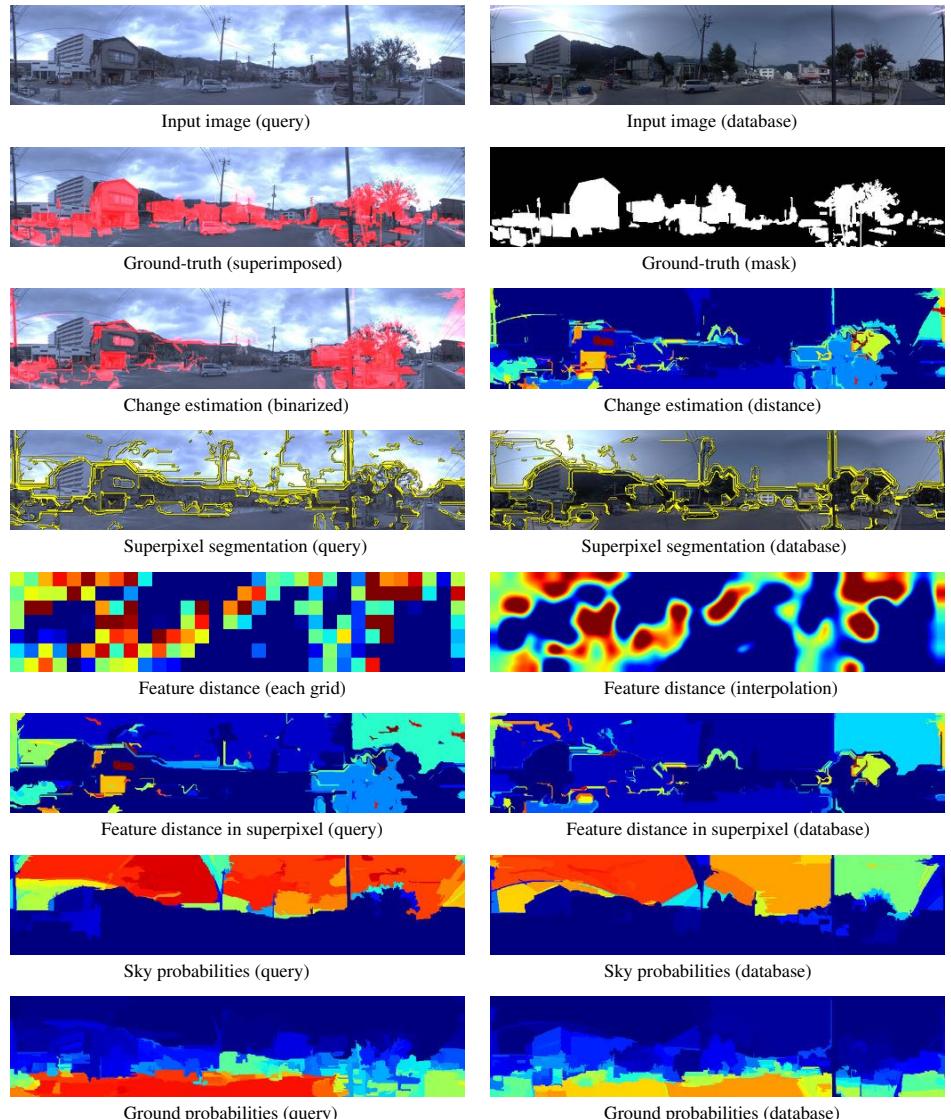


Figure 66: Results of change detection using pool-5 feature of CNN (Frame No. 66/100 in change detection dataset of tsunami)

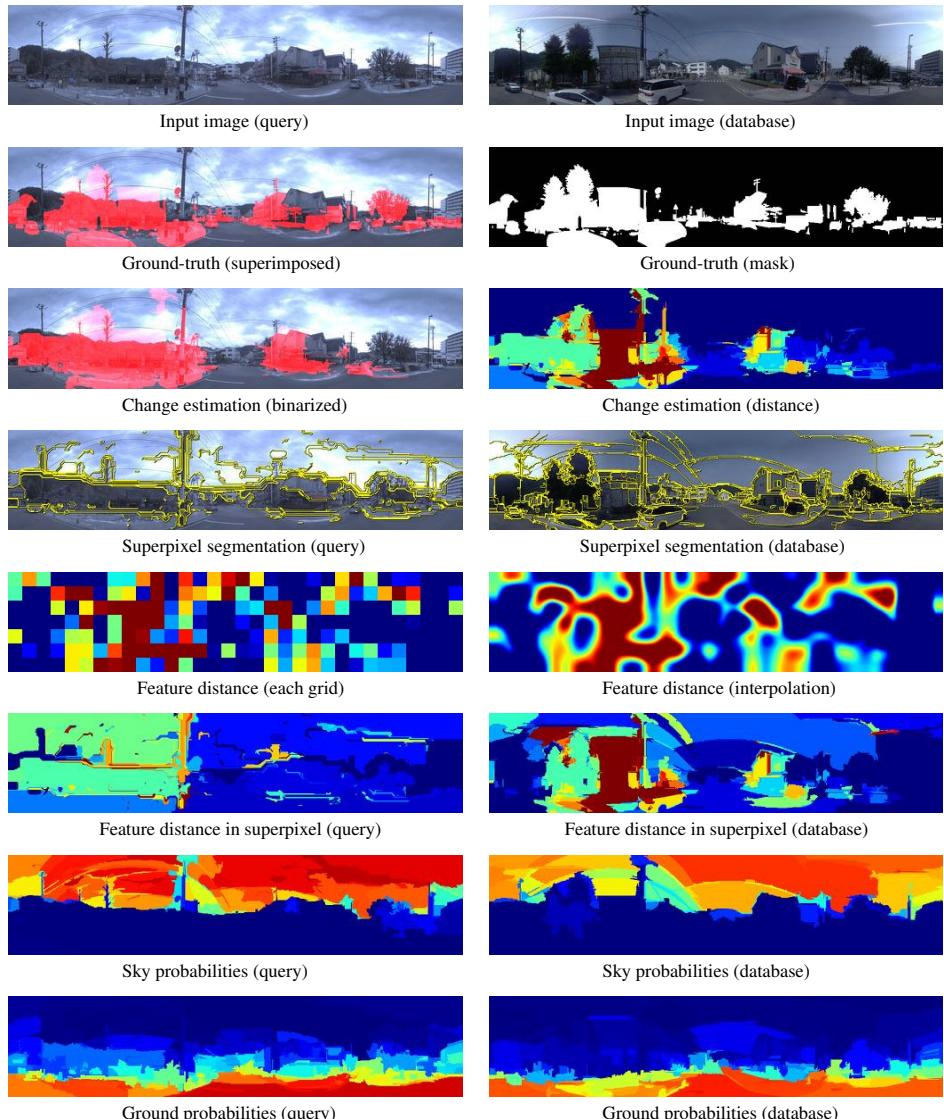


Figure 67: Results of change detection using pool-5 feature of CNN (Frame No. 67/100 in change detection dataset of tsunami)

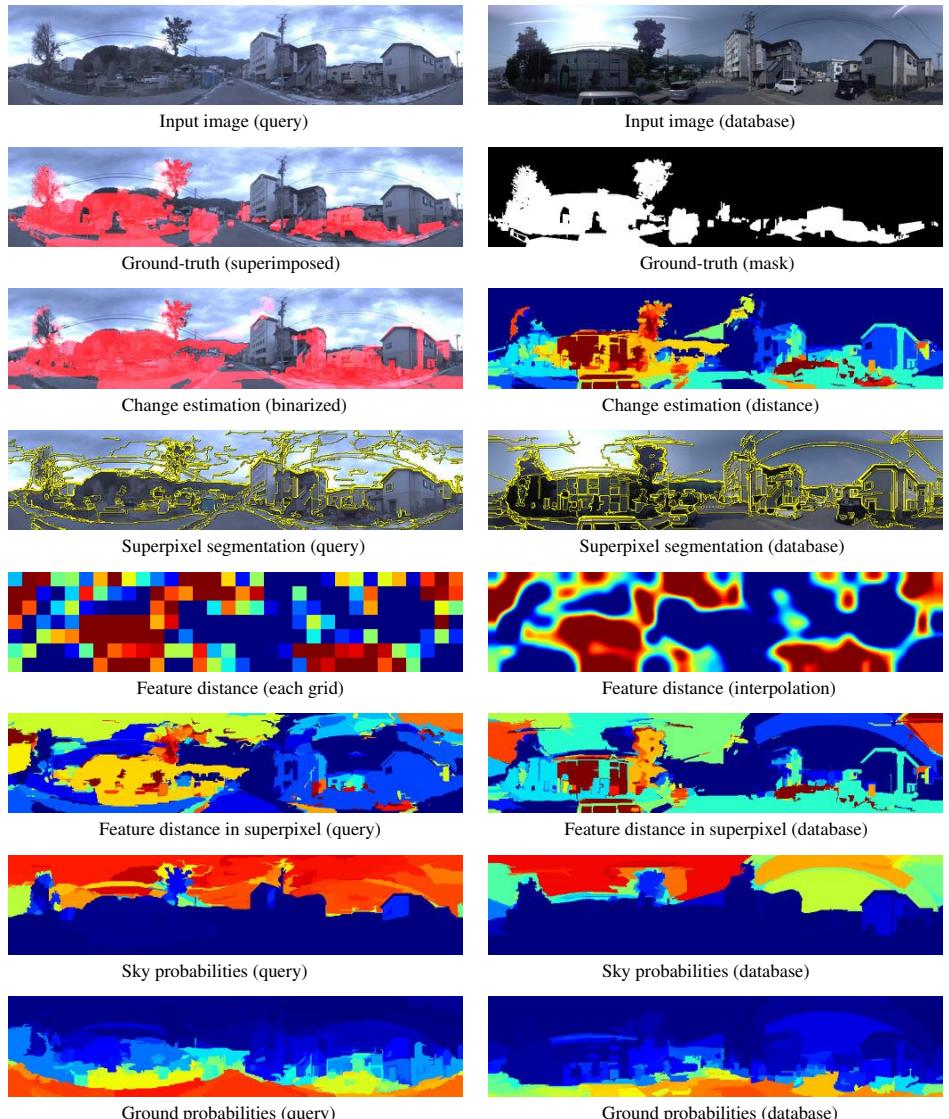


Figure 68: Results of change detection using pool-5 feature of CNN (Frame No. 68/100 in change detection dataset of tsunami)

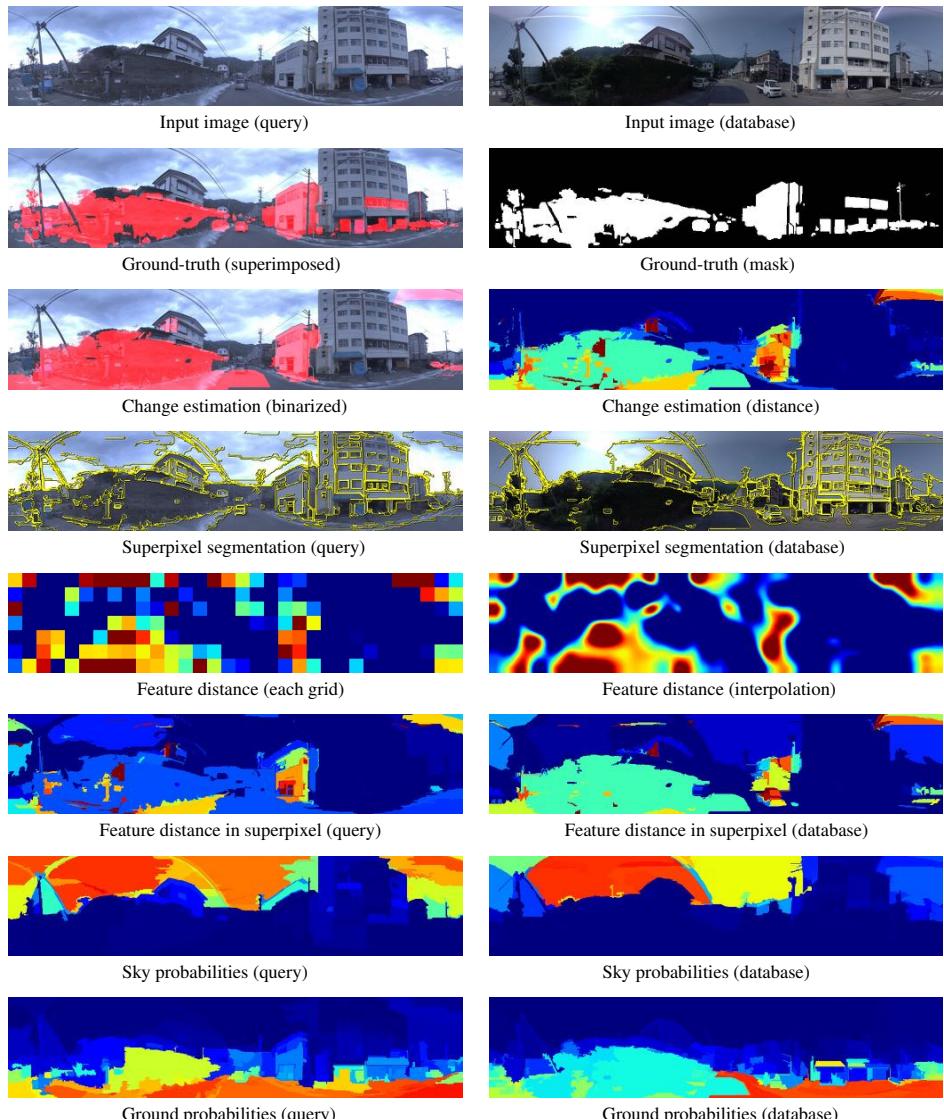


Figure 69: Results of change detection using pool-5 feature of CNN (Frame No. 69/100 in change detection dataset of tsunami)

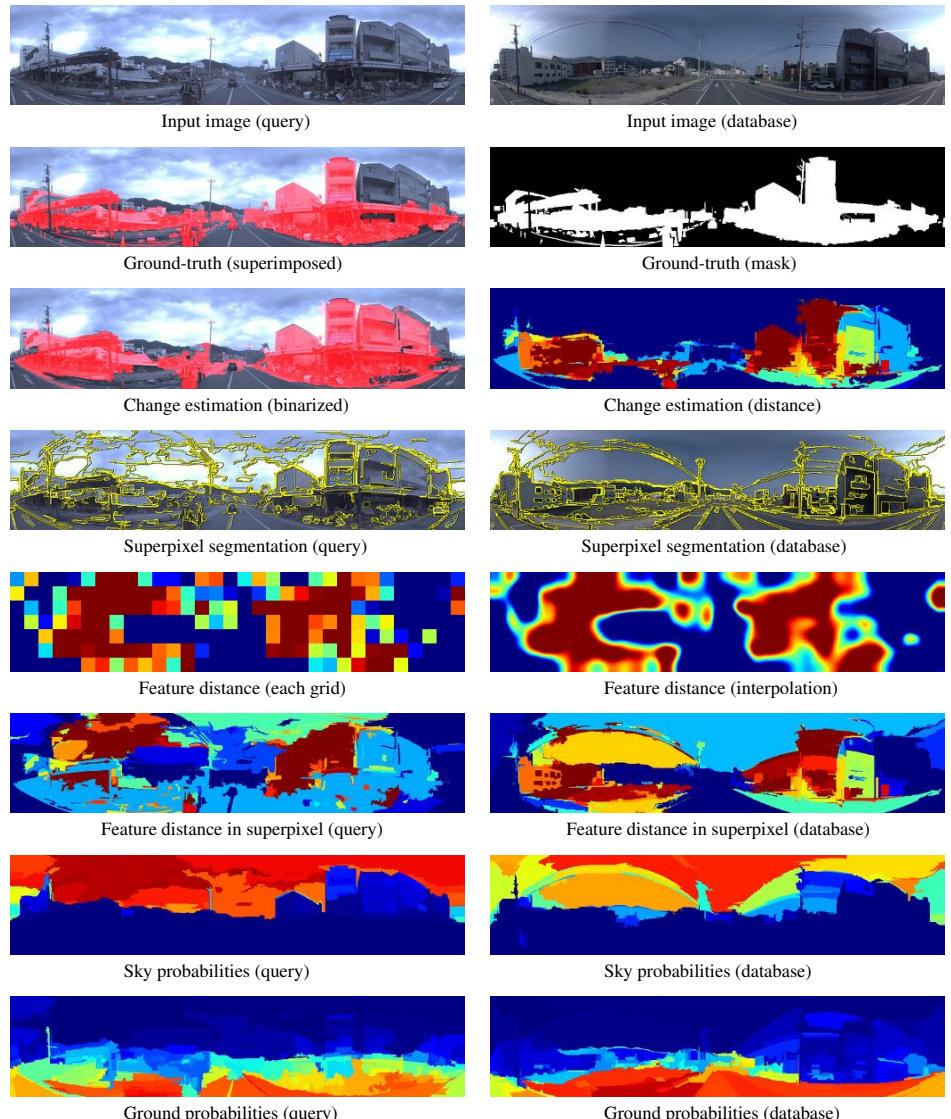


Figure 70: Results of change detection using pool-5 feature of CNN (Frame No. 70/100 in change detection dataset of tsunami)

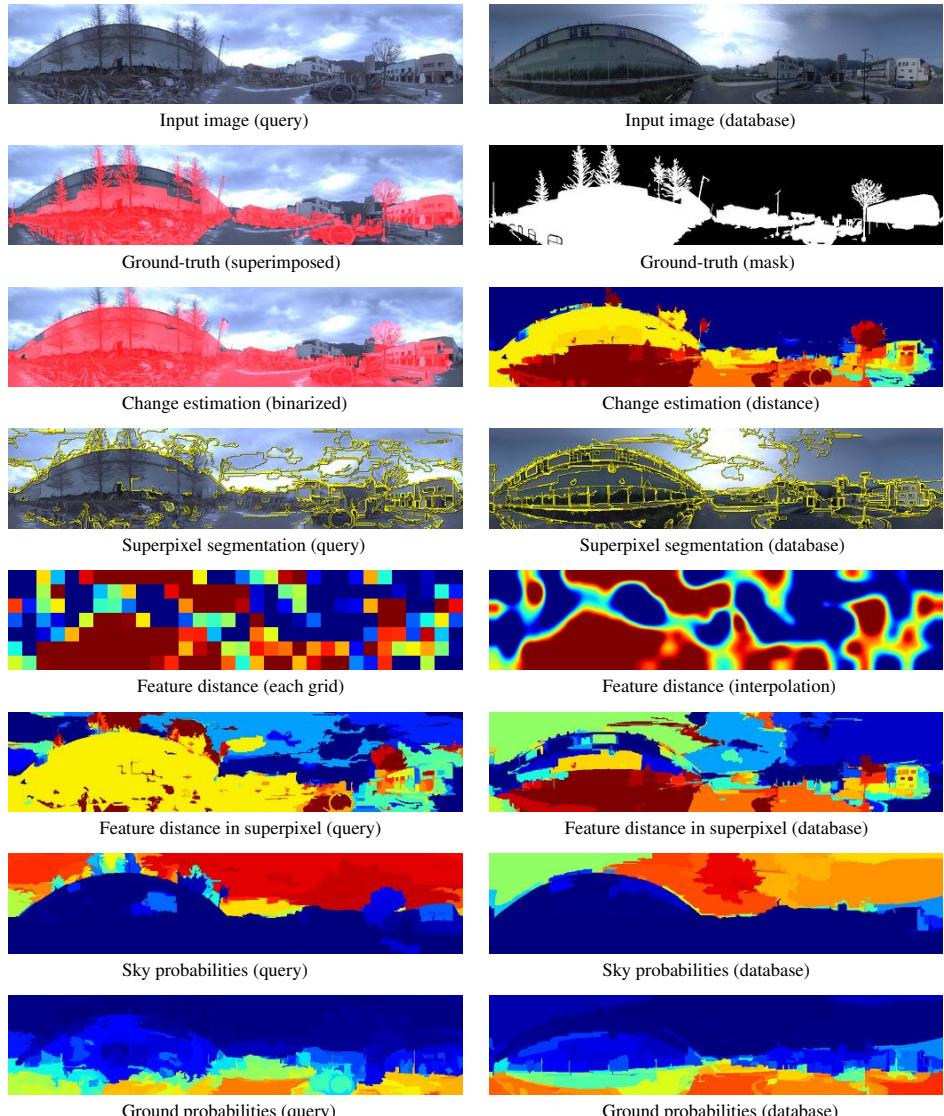


Figure 71: Results of change detection using pool-5 feature of CNN (Frame No. 71/100 in change detection dataset of tsunami)

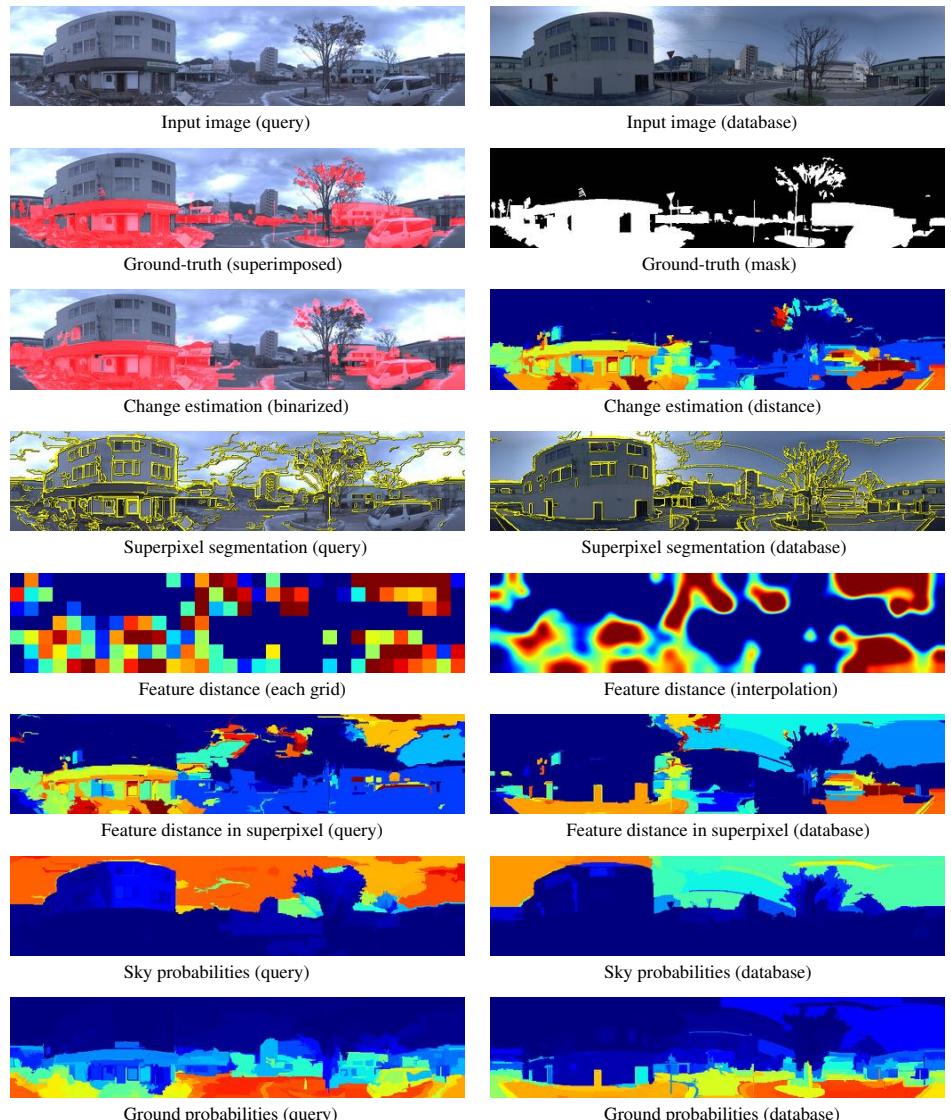


Figure 72: Results of change detection using pool-5 feature of CNN (Frame No. 72/100 in change detection dataset of tsunami)

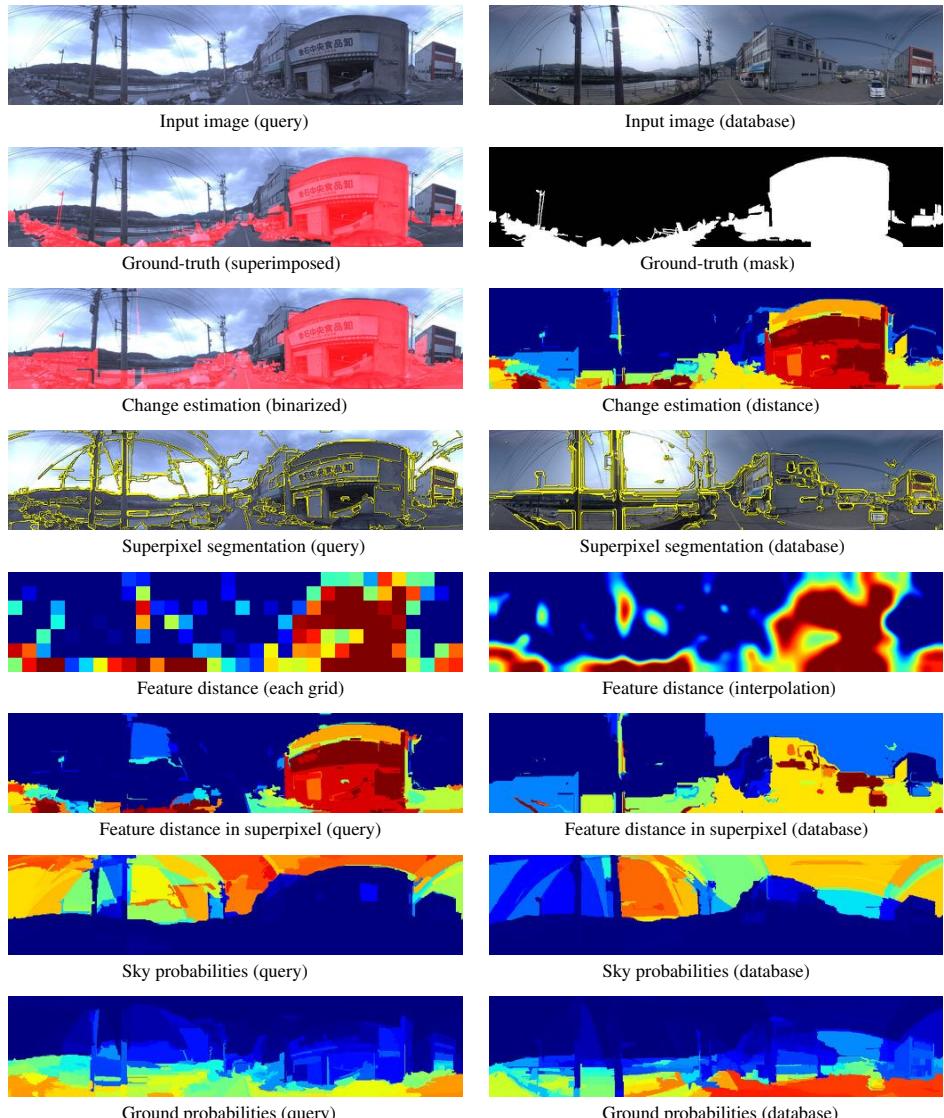


Figure 73: Results of change detection using pool-5 feature of CNN (Frame No. 73/100 in change detection dataset of tsunami)

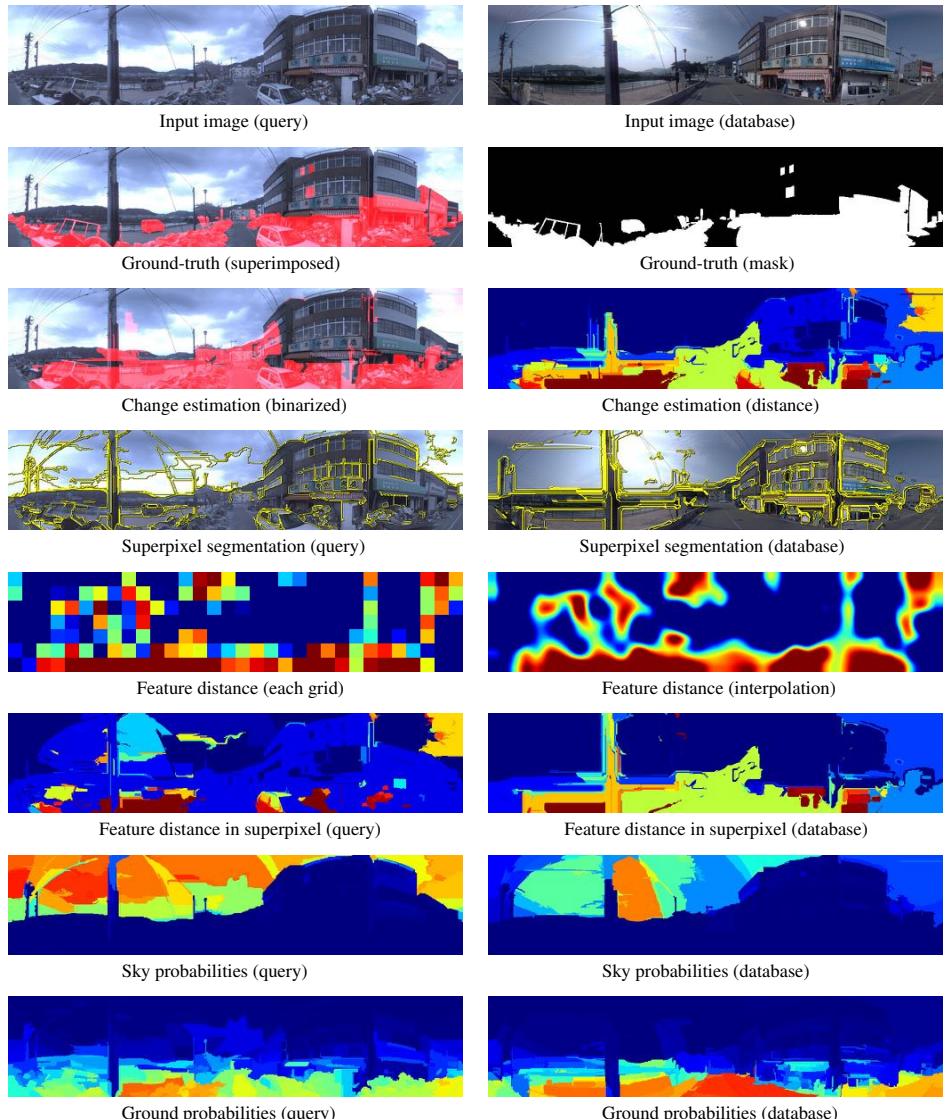


Figure 74: Results of change detection using pool-5 feature of CNN (Frame No. 74/100 in change detection dataset of tsunami)

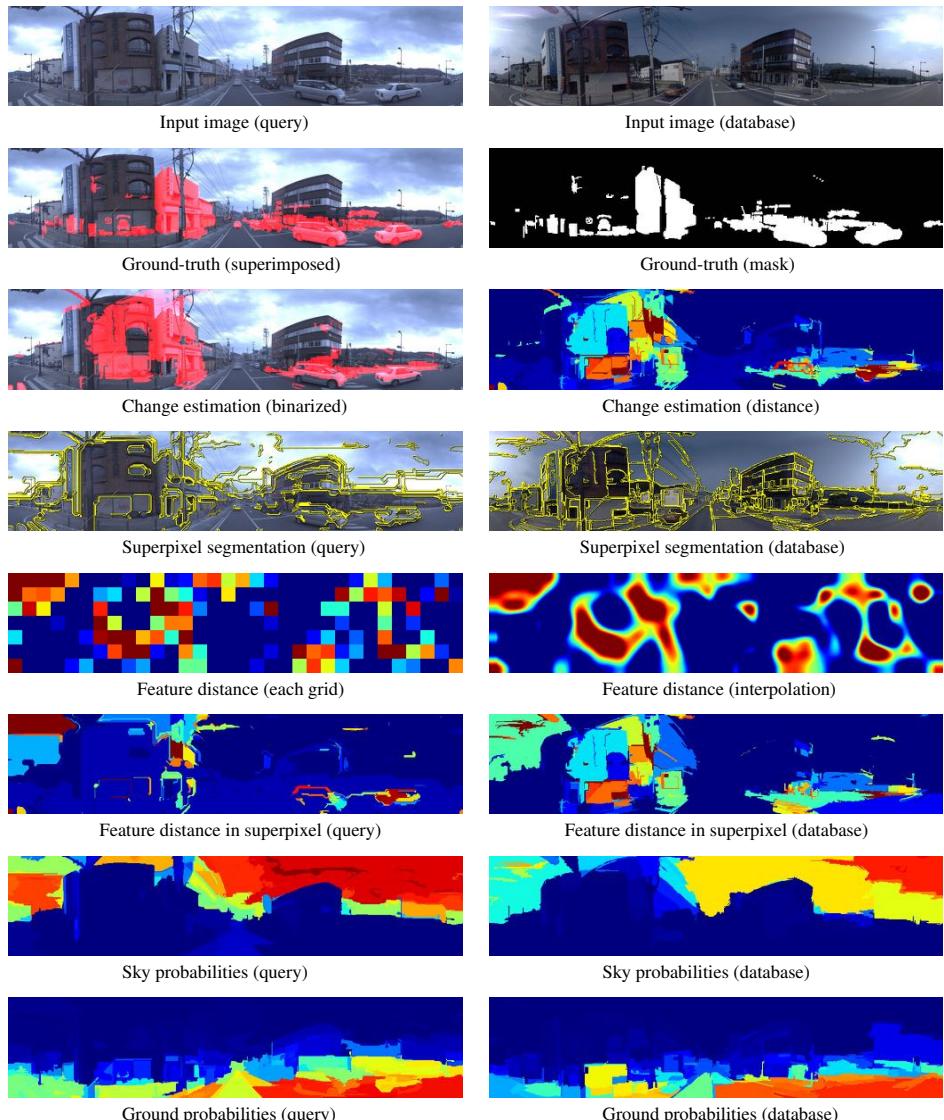


Figure 75: Results of change detection using pool-5 feature of CNN (Frame No. 75/100 in change detection dataset of tsunami)

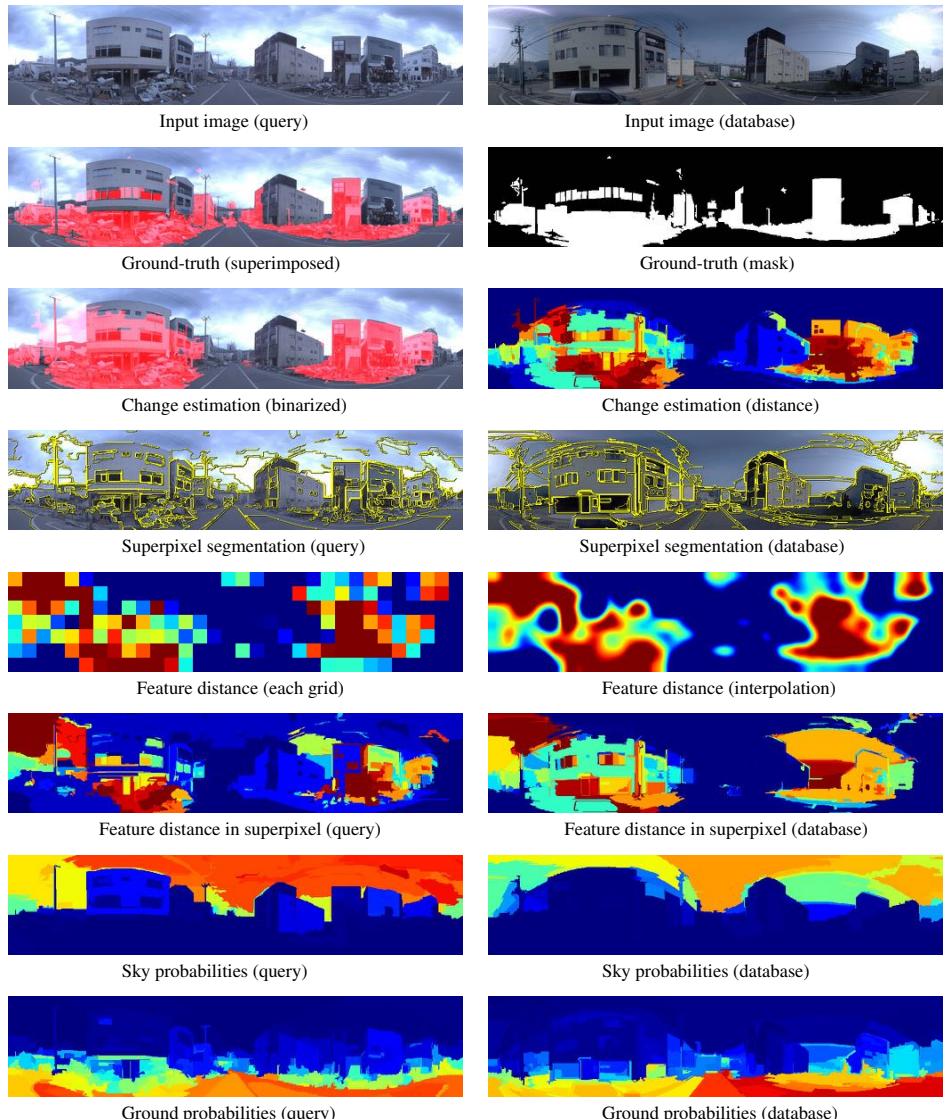


Figure 76: Results of change detection using pool-5 feature of CNN (Frame No. 76/100 in change detection dataset of tsunami)

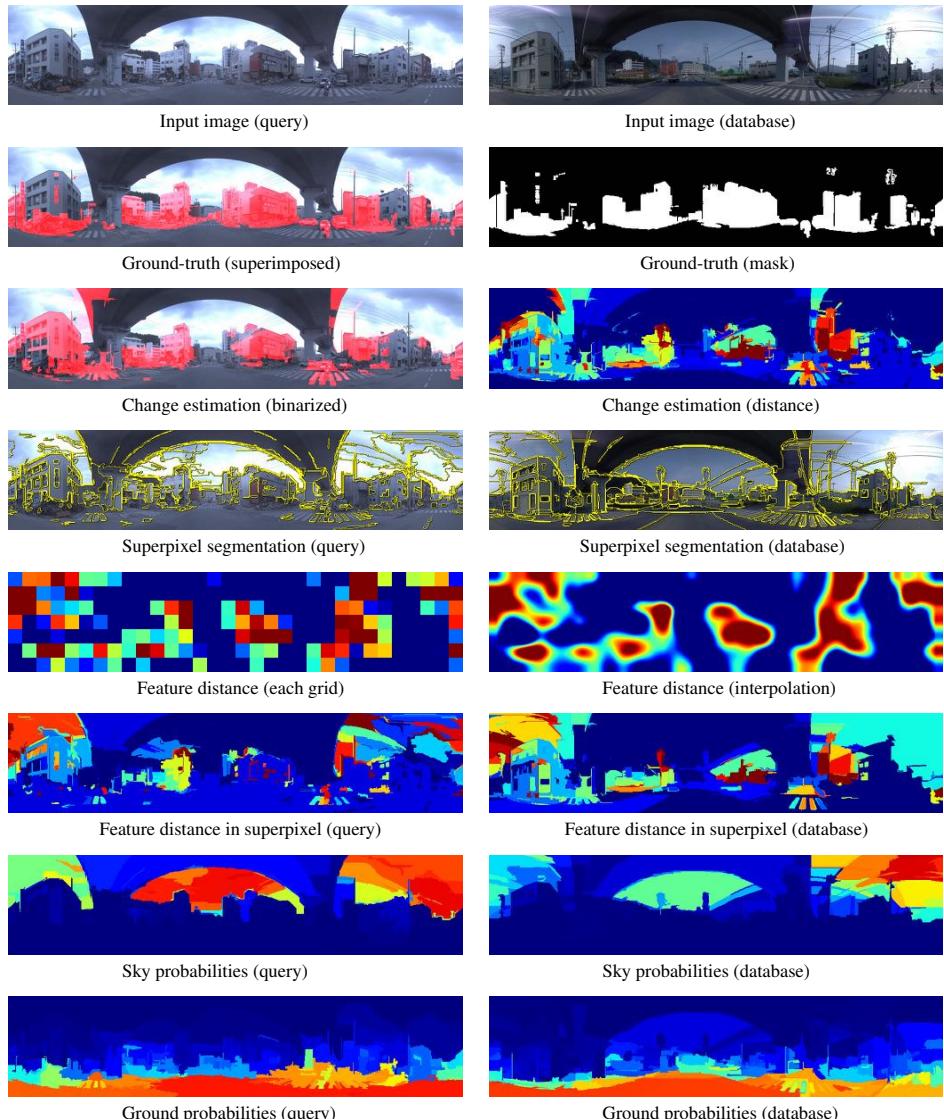


Figure 77: Results of change detection using pool-5 feature of CNN (Frame No. 77/100 in change detection dataset of tsunami)

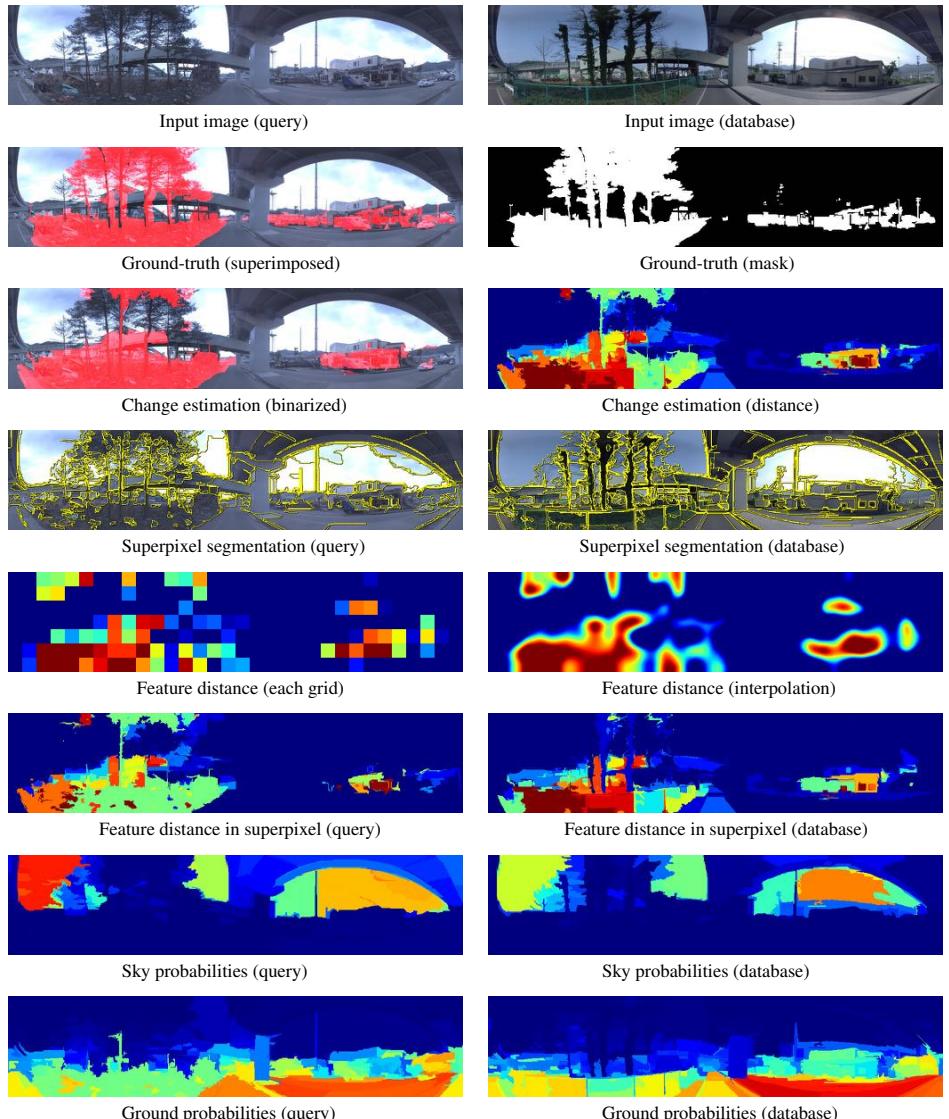


Figure 78: Results of change detection using pool-5 feature of CNN (Frame No. 78/100 in change detection dataset of tsunami)

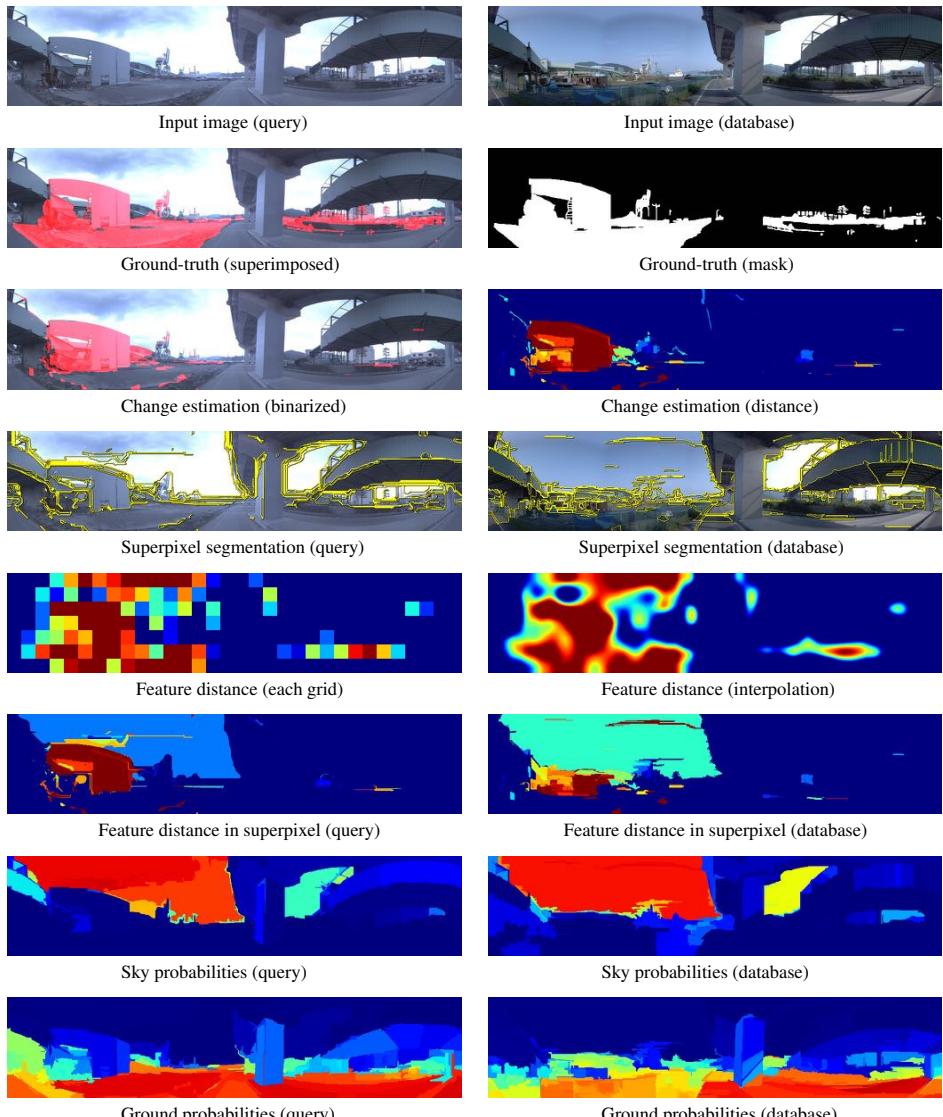


Figure 79: Results of change detection using pool-5 feature of CNN (Frame No. 79/100 in change detection dataset of tsunami)

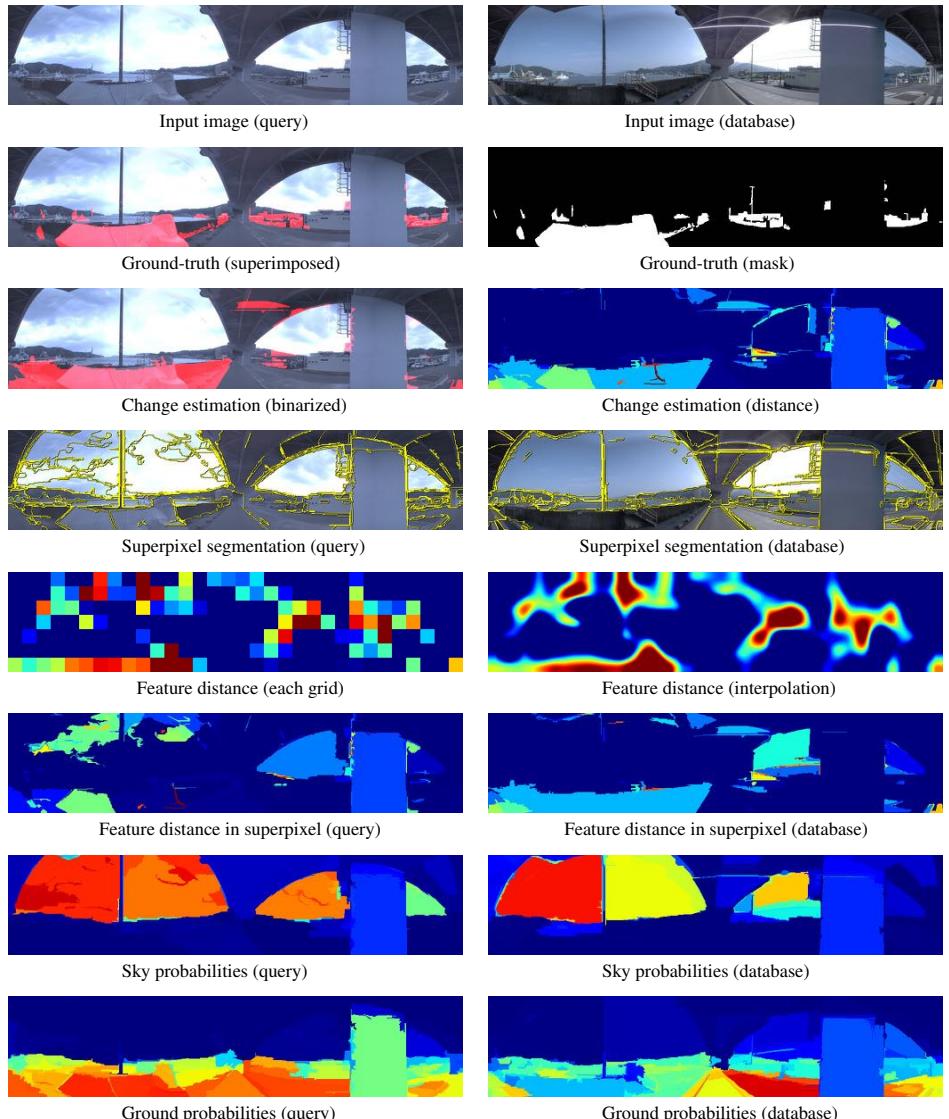


Figure 80: Results of change detection using pool-5 feature of CNN (Frame No. 80/100 in change detection dataset of tsunami)

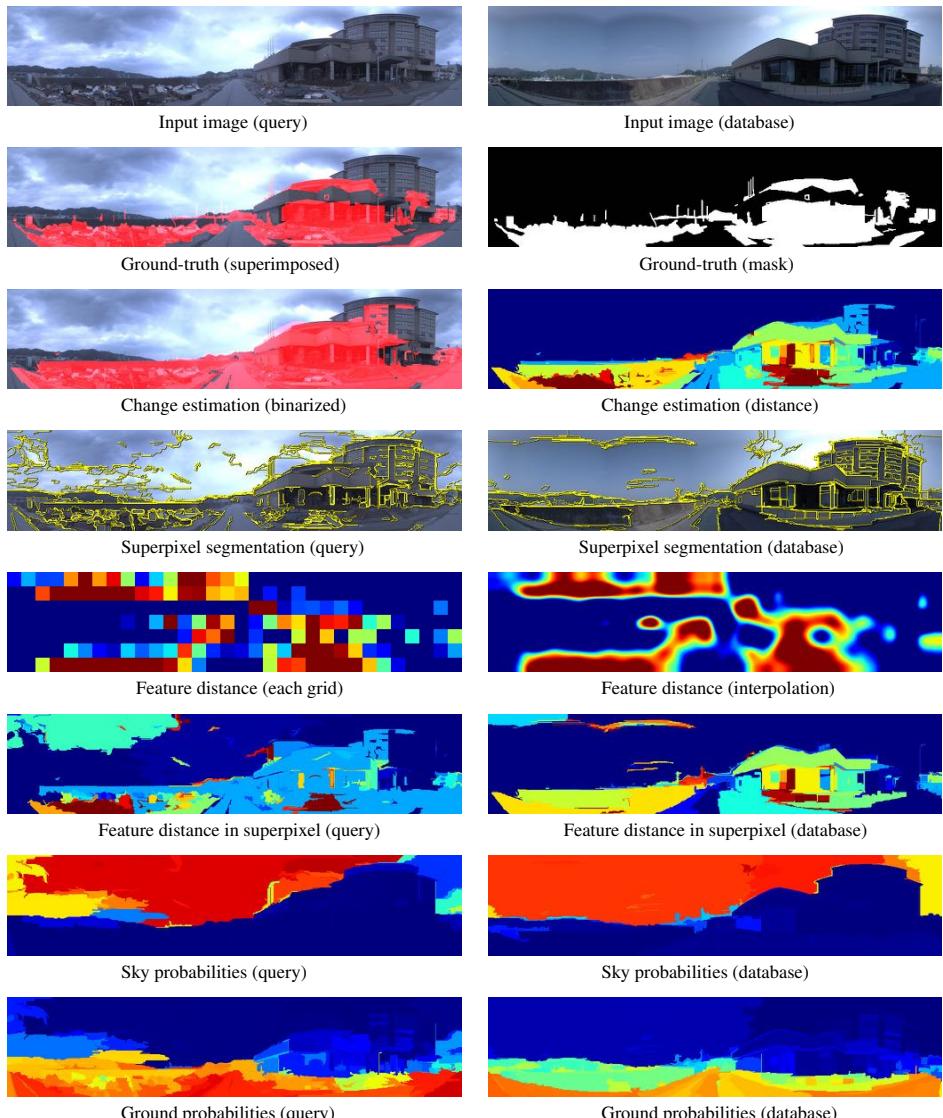


Figure 81: Results of change detection using pool-5 feature of CNN (Frame No. 81/100 in change detection dataset of tsunami)

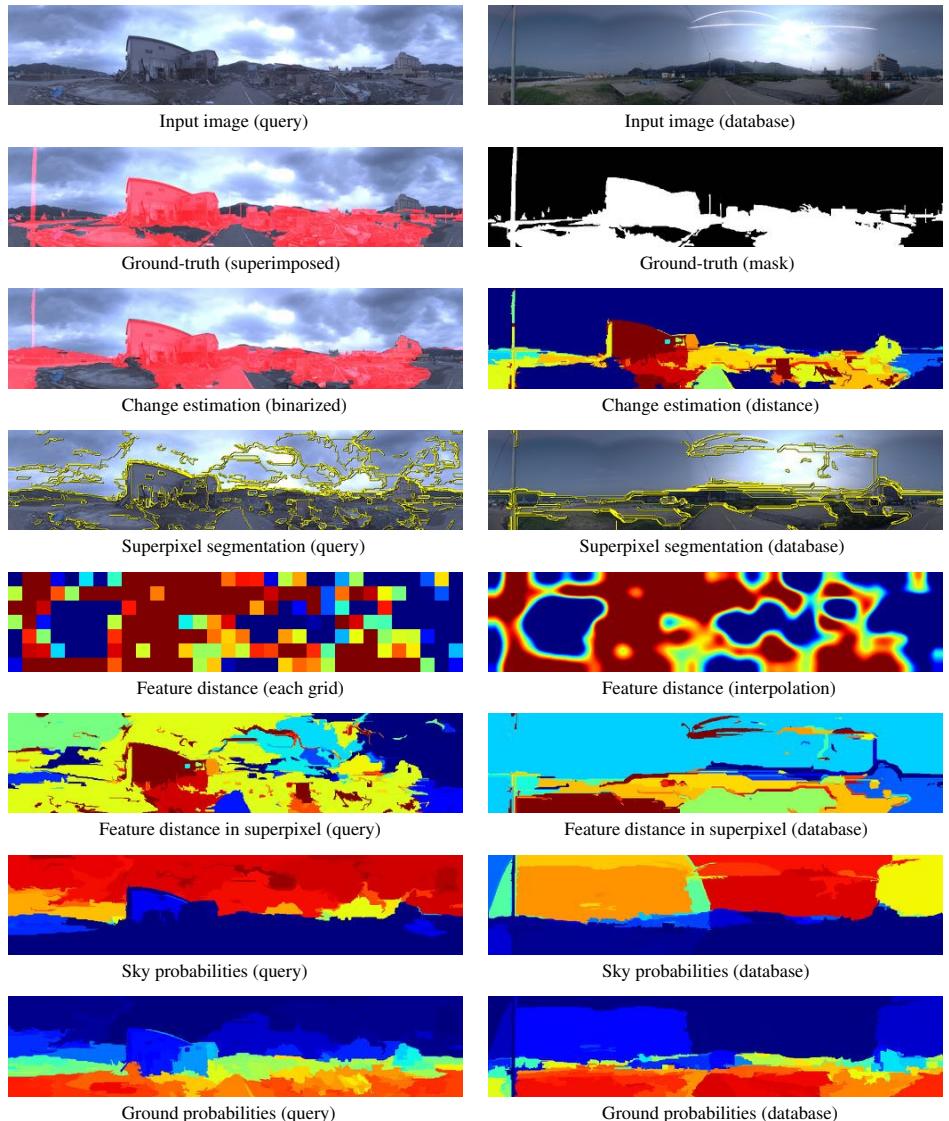


Figure 82: Results of change detection using pool-5 feature of CNN (Frame No. 82/100 in change detection dataset of tsunami)

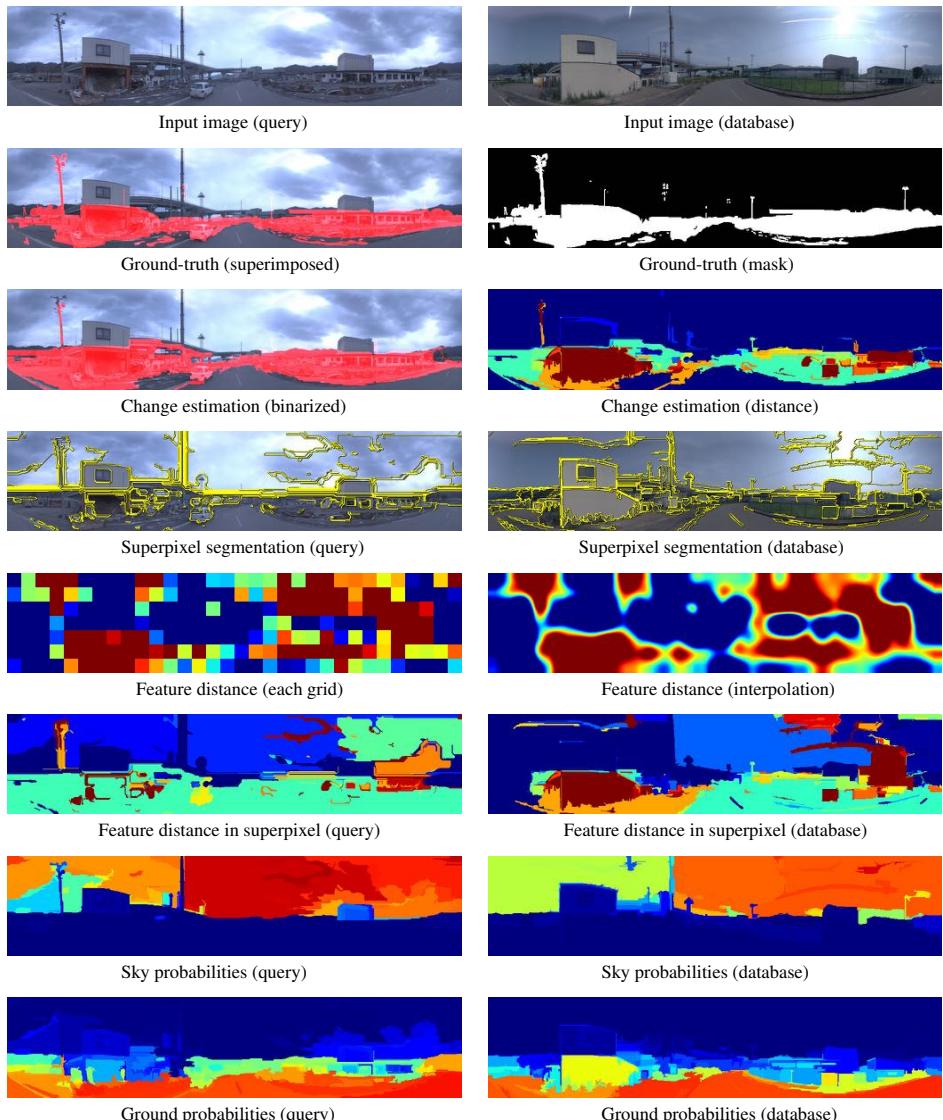


Figure 83: Results of change detection using pool-5 feature of CNN (Frame No. 83/100 in change detection dataset of tsunami)

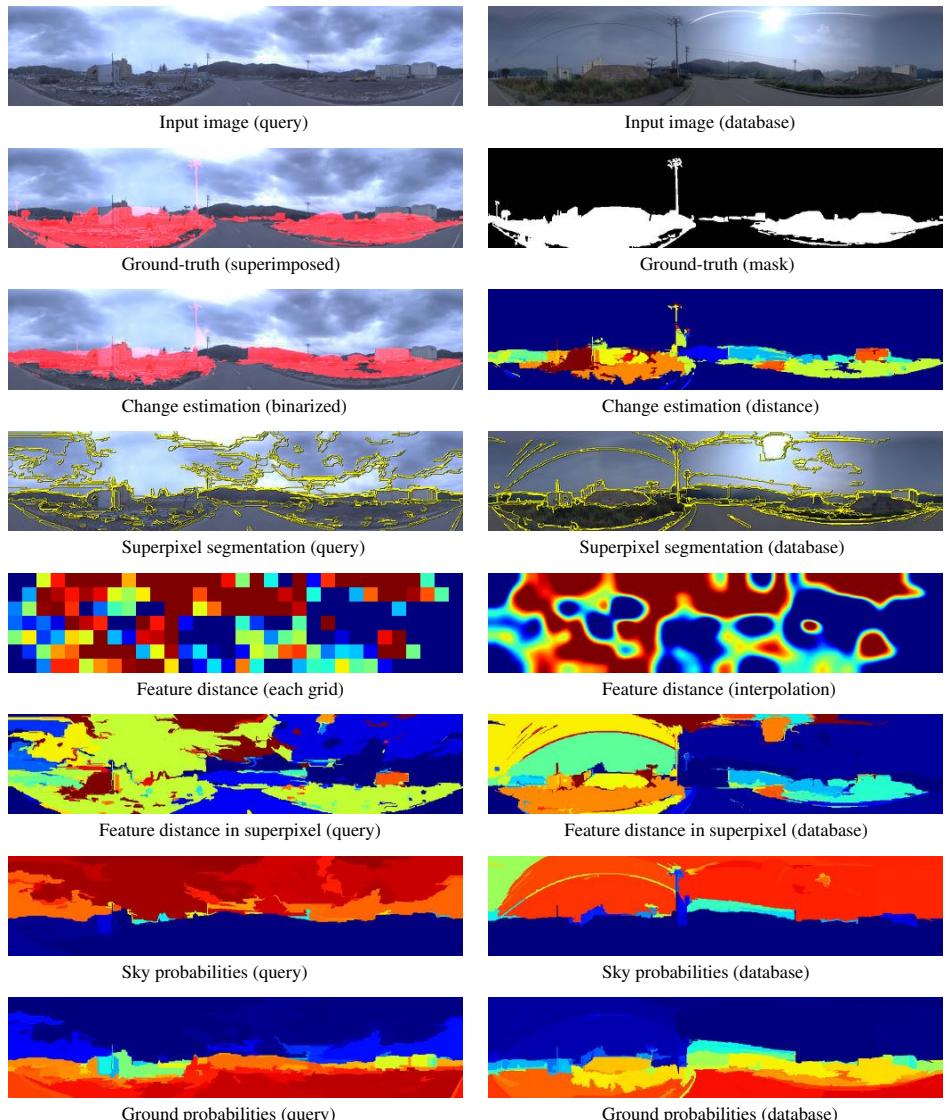


Figure 84: Results of change detection using pool-5 feature of CNN (Frame No. 84/100 in change detection dataset of tsunami)

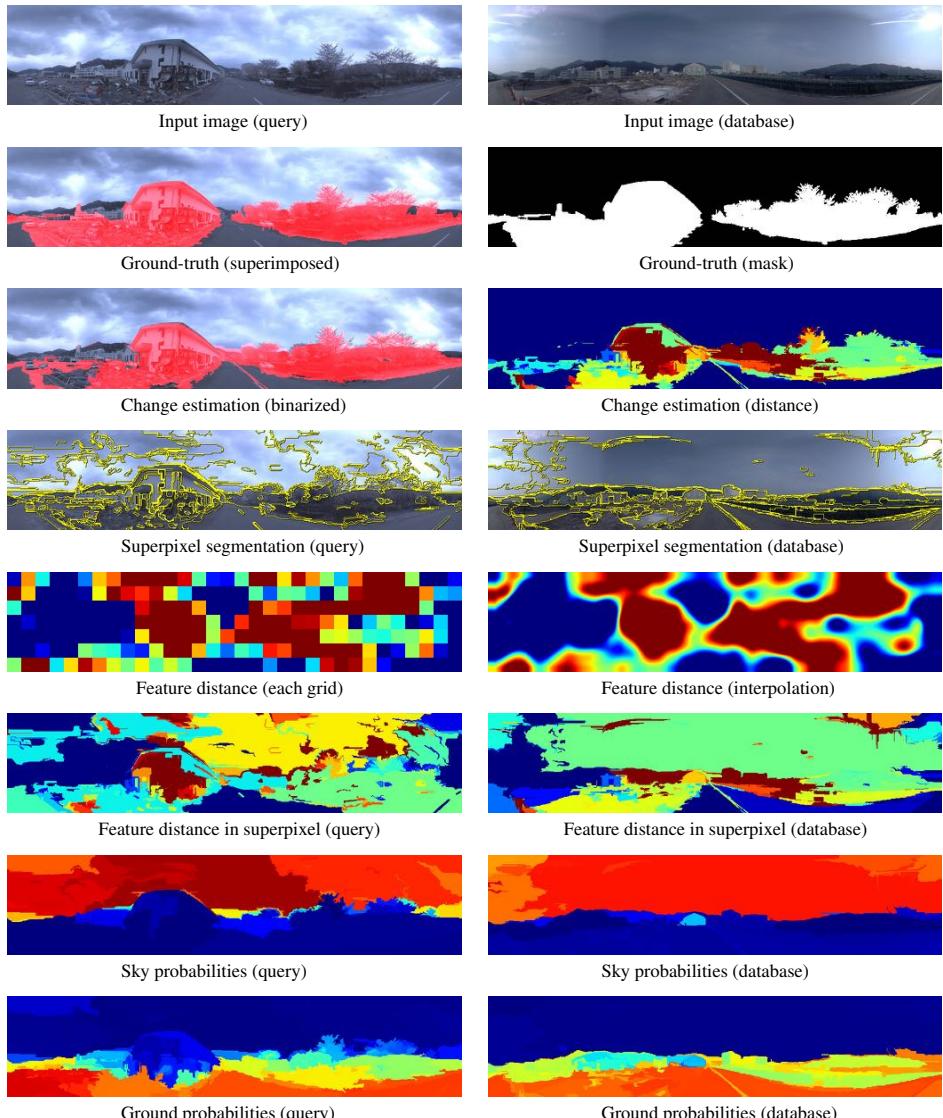


Figure 85: Results of change detection using pool-5 feature of CNN (Frame No. 85/100 in change detection dataset of tsunami)

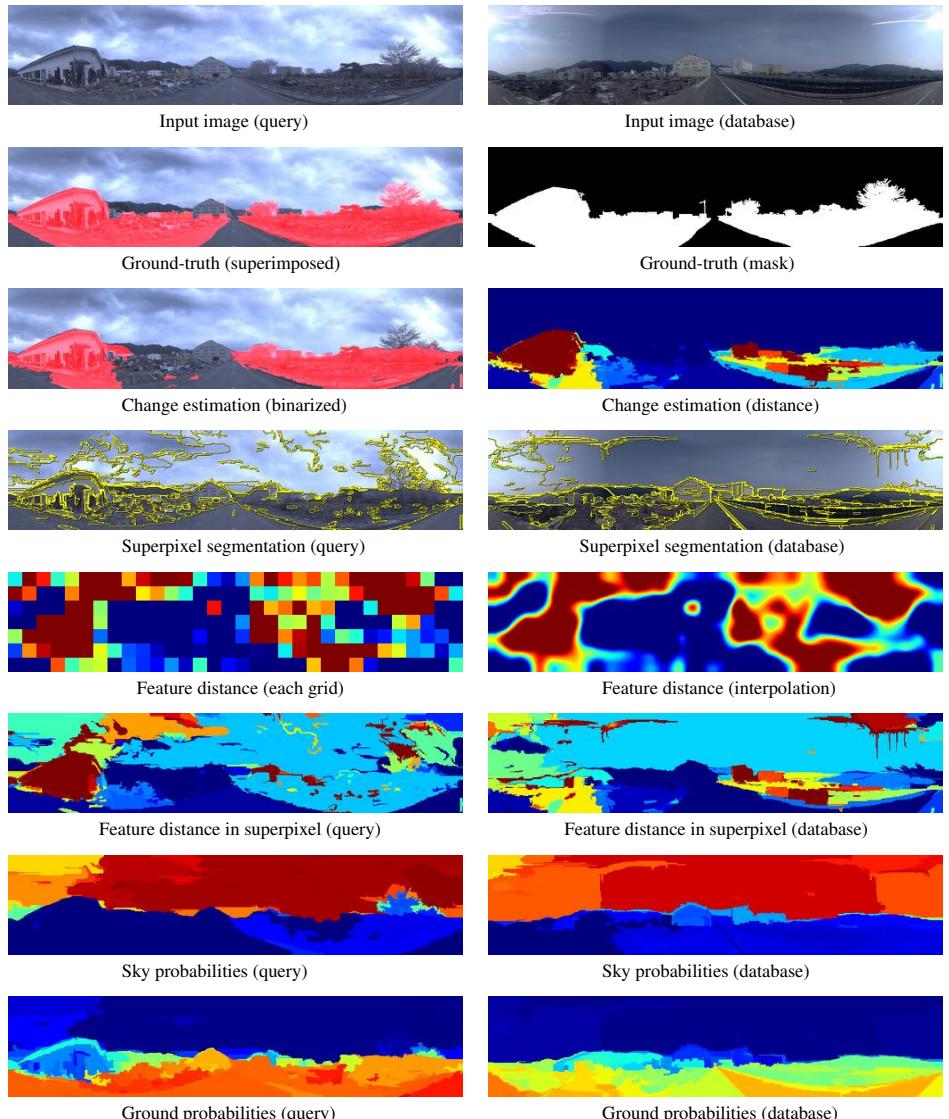


Figure 86: Results of change detection using pool-5 feature of CNN (Frame No. 86/100 in change detection dataset of tsunami)

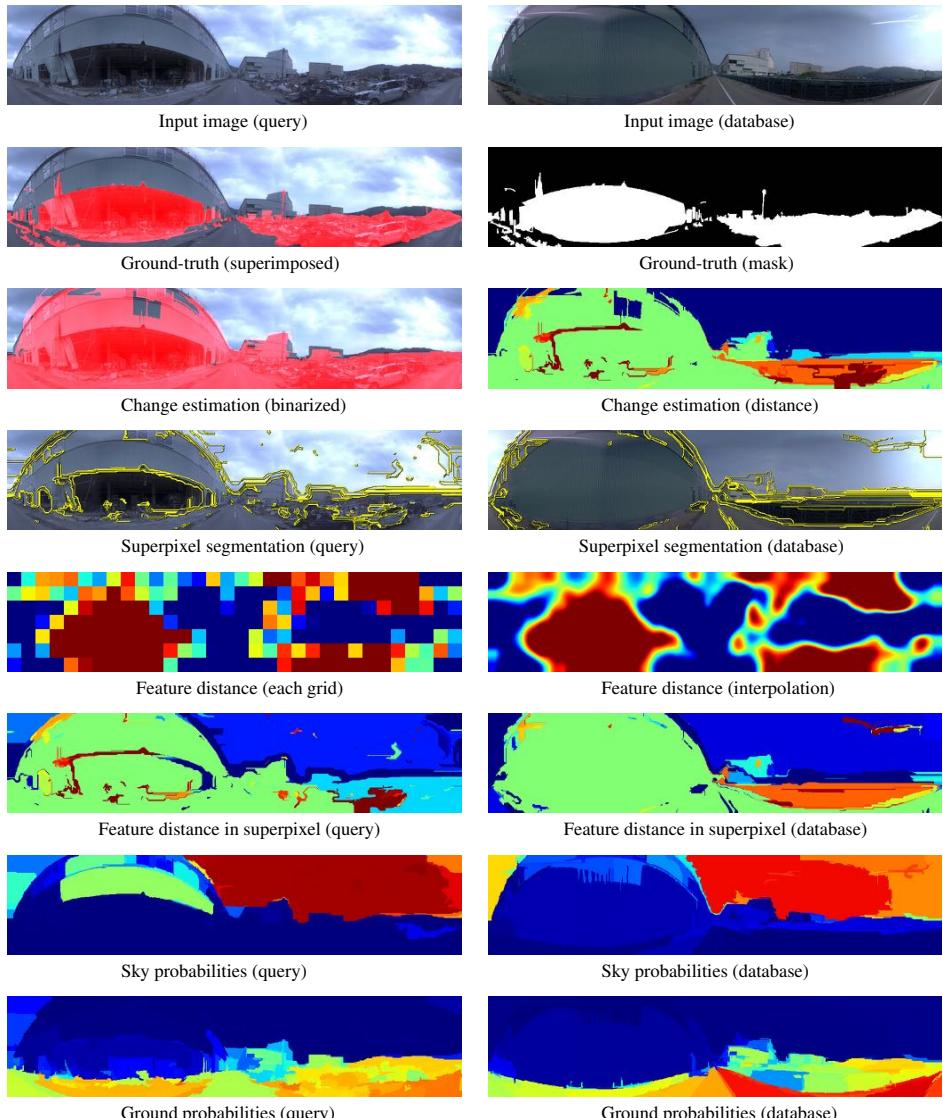


Figure 87: Results of change detection using pool-5 feature of CNN (Frame No. 87/100 in change detection dataset of tsunami)

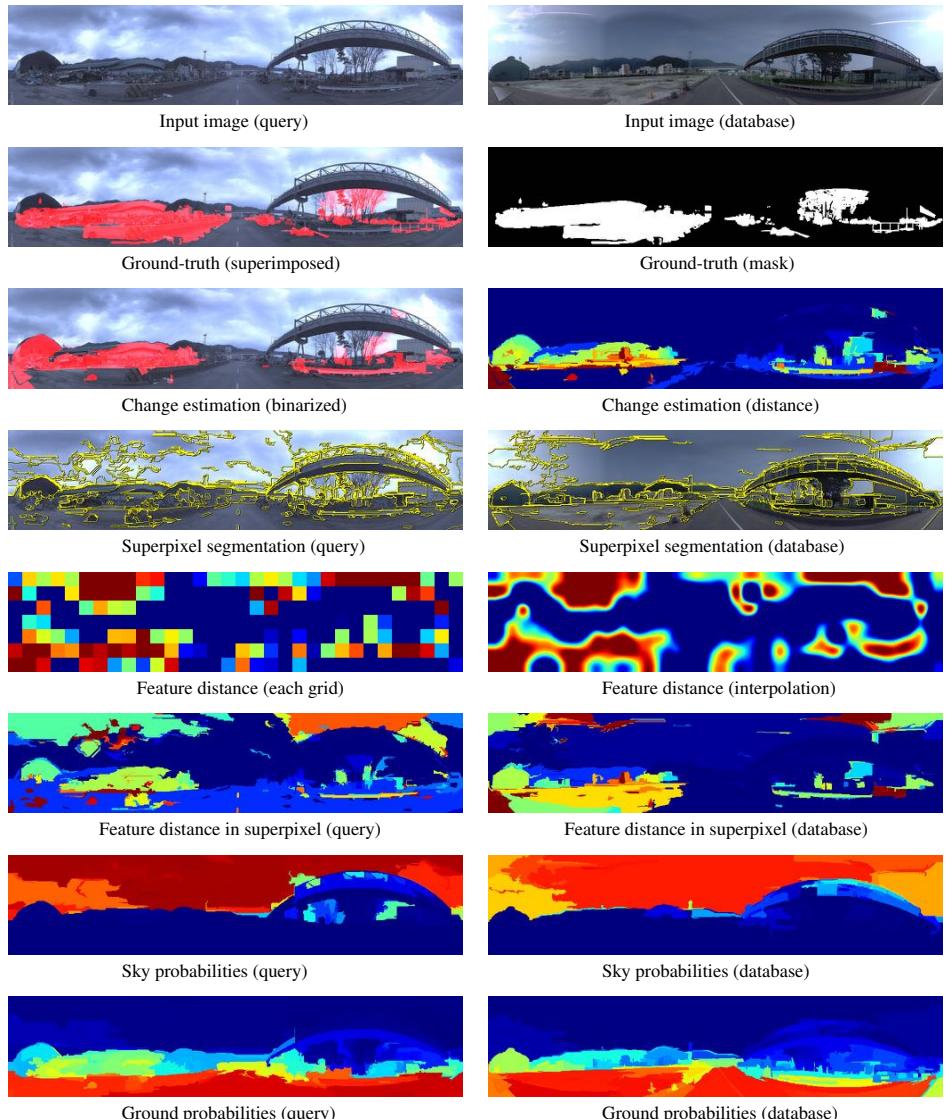


Figure 88: Results of change detection using pool-5 feature of CNN (Frame No. 88/100 in change detection dataset of tsunami)

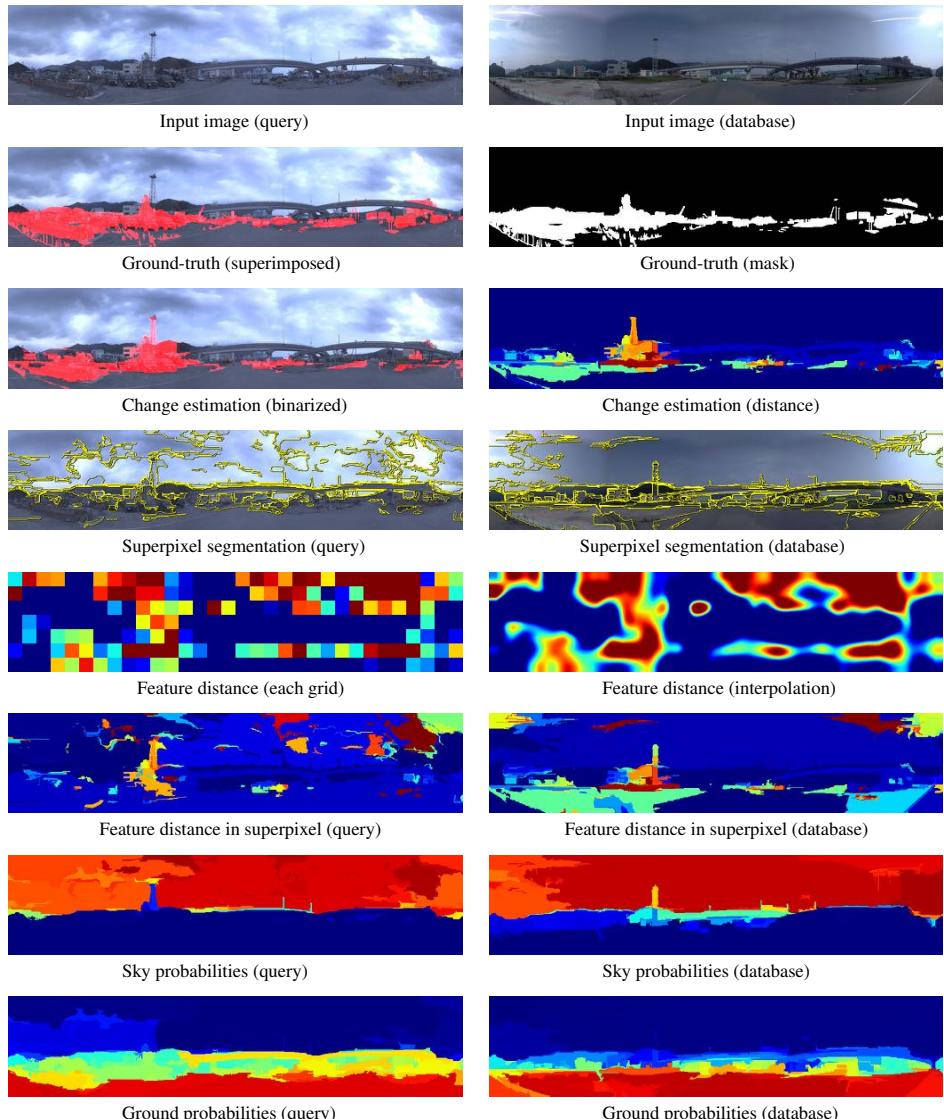


Figure 89: Results of change detection using pool-5 feature of CNN (Frame No. 89/100 in change detection dataset of tsunami)

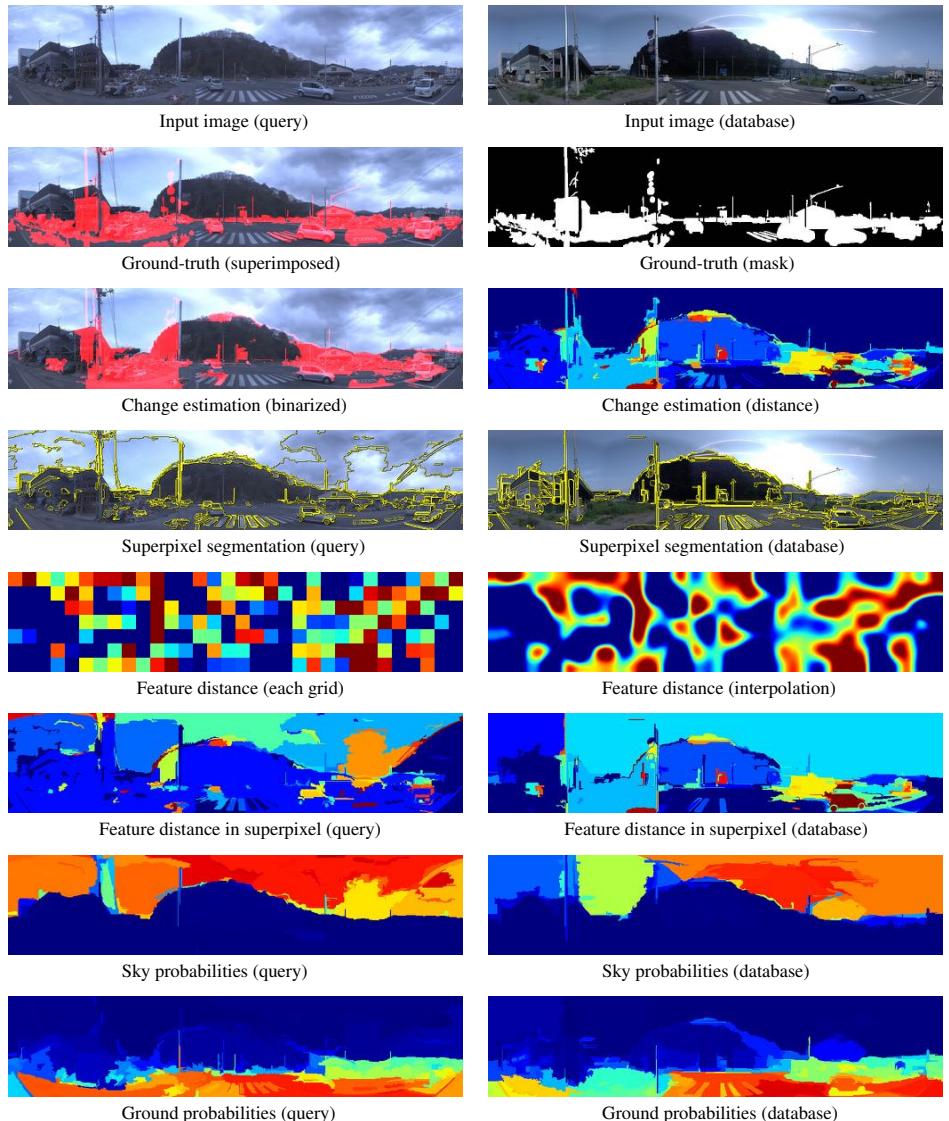


Figure 90: Results of change detection using pool-5 feature of CNN (Frame No. 90/100 in change detection dataset of tsunami)

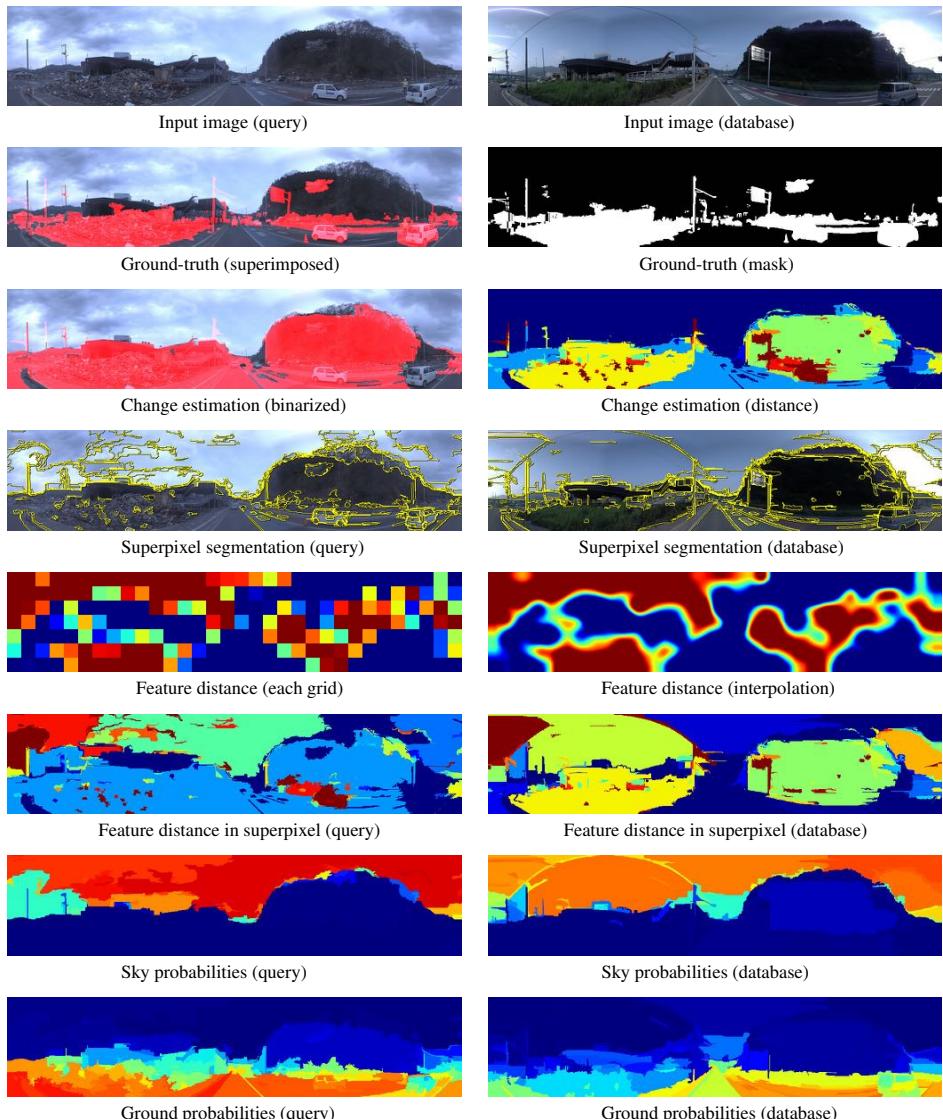


Figure 91: Results of change detection using pool-5 feature of CNN (Frame No. 91/100 in change detection dataset of tsunami)

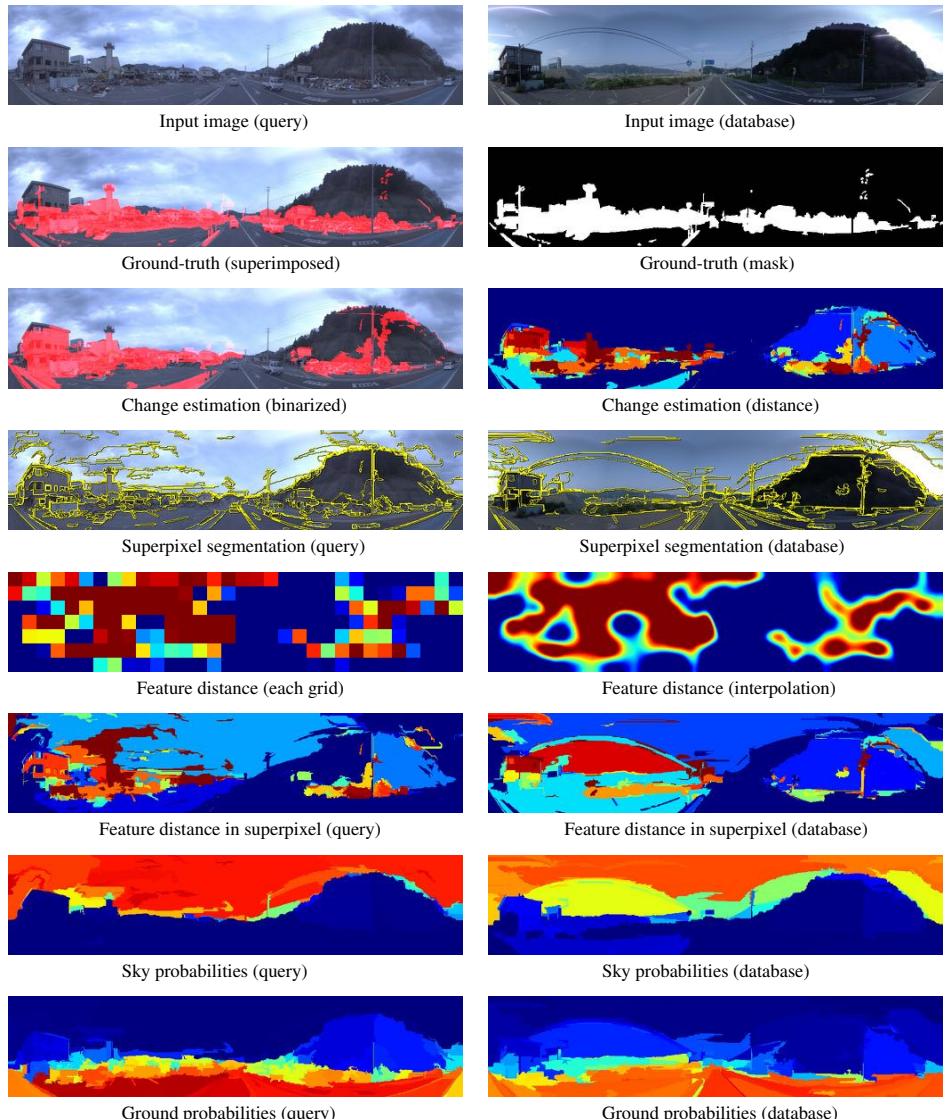


Figure 92: Results of change detection using pool-5 feature of CNN (Frame No. 92/100 in change detection dataset of tsunami)

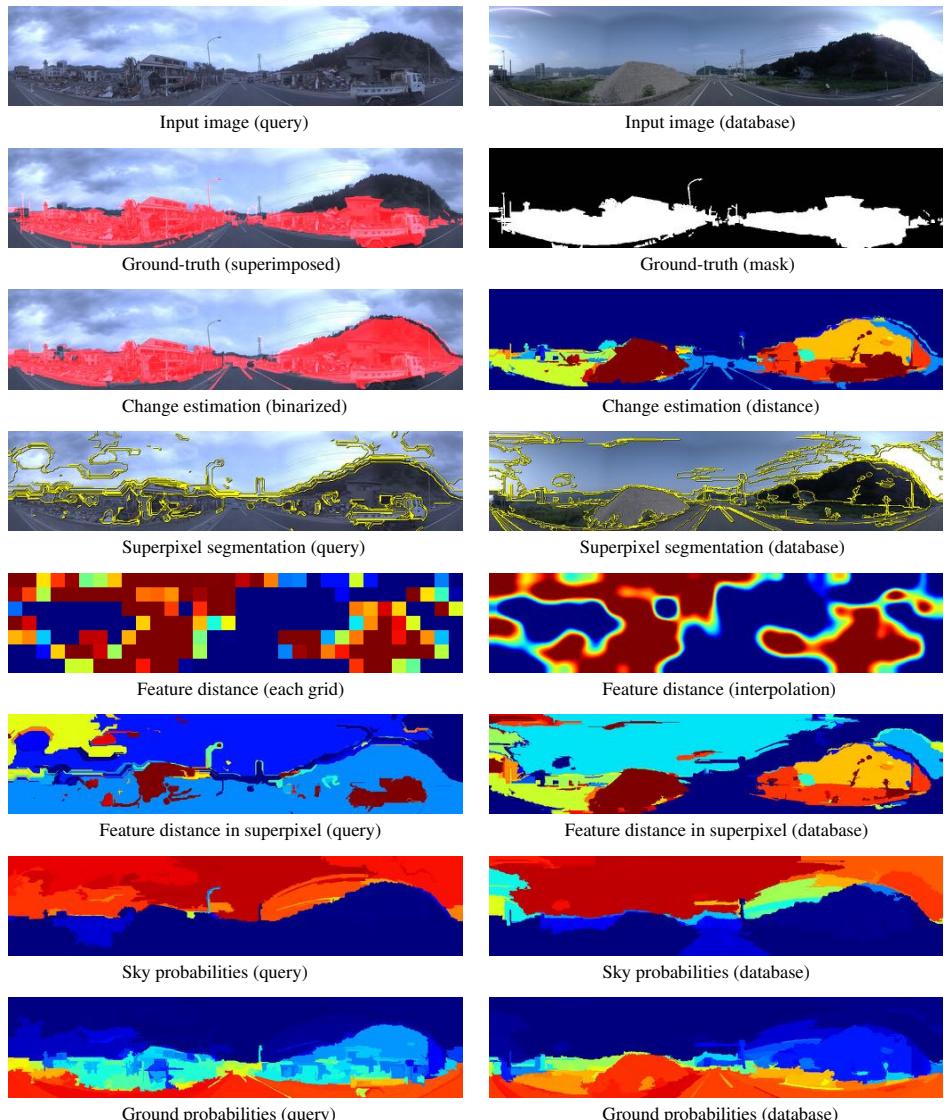


Figure 93: Results of change detection using pool-5 feature of CNN (Frame No. 93/100 in change detection dataset of tsunami)

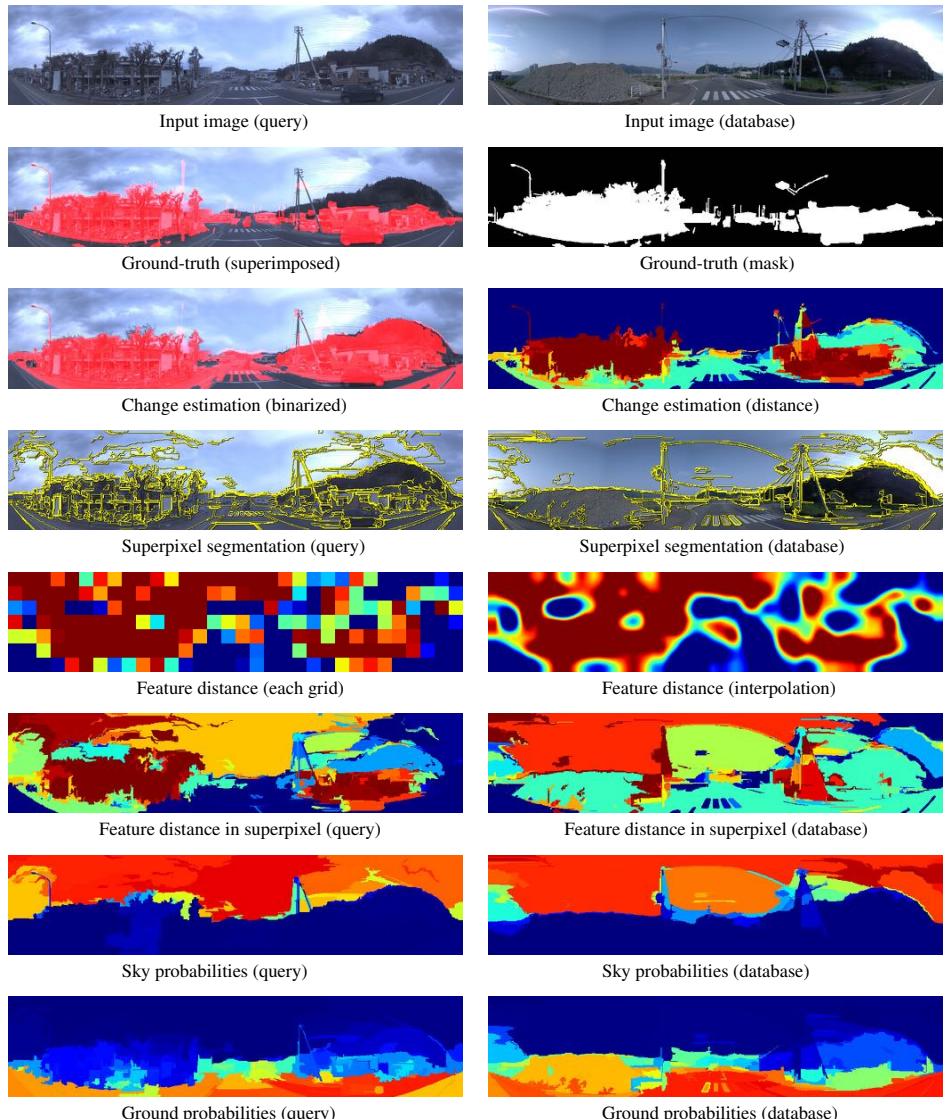


Figure 94: Results of change detection using pool-5 feature of CNN (Frame No. 94/100 in change detection dataset of tsunami)

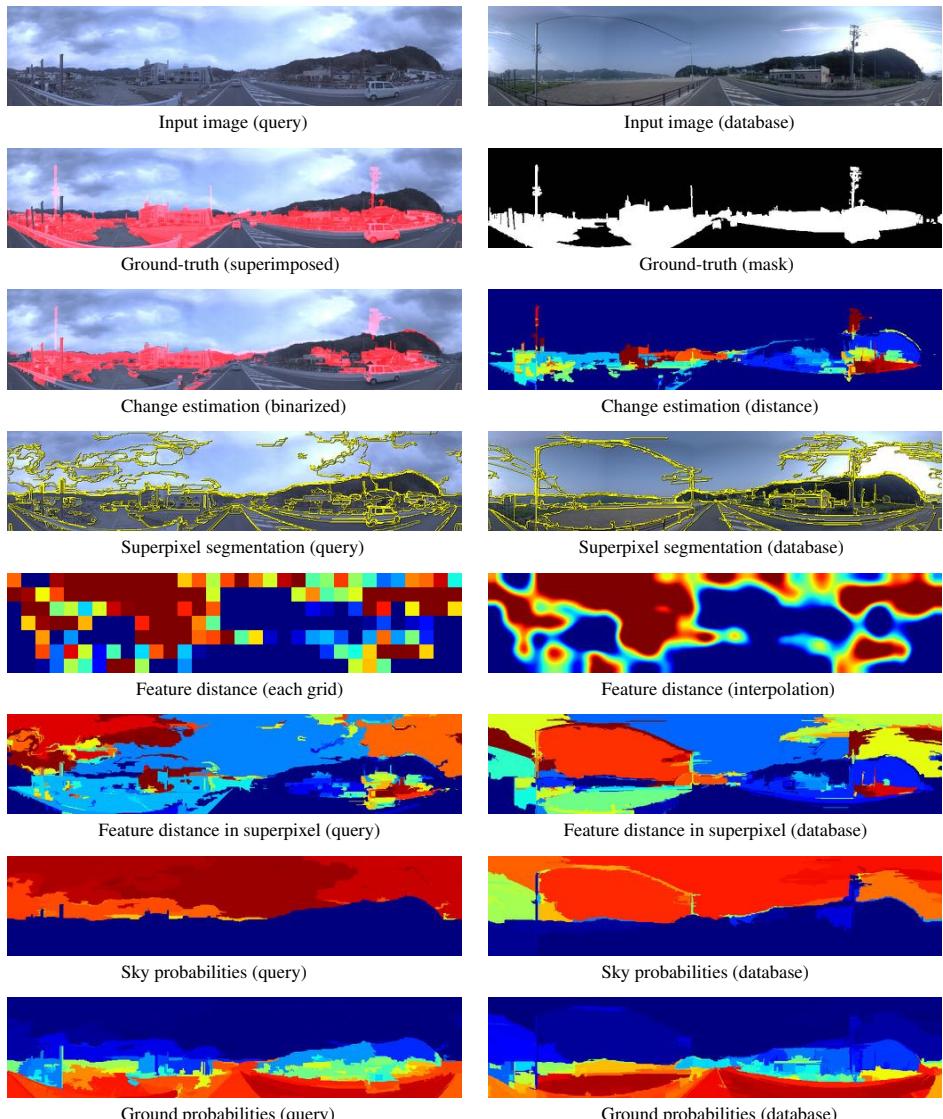


Figure 95: Results of change detection using pool-5 feature of CNN (Frame No. 95/100 in change detection dataset of tsunami)

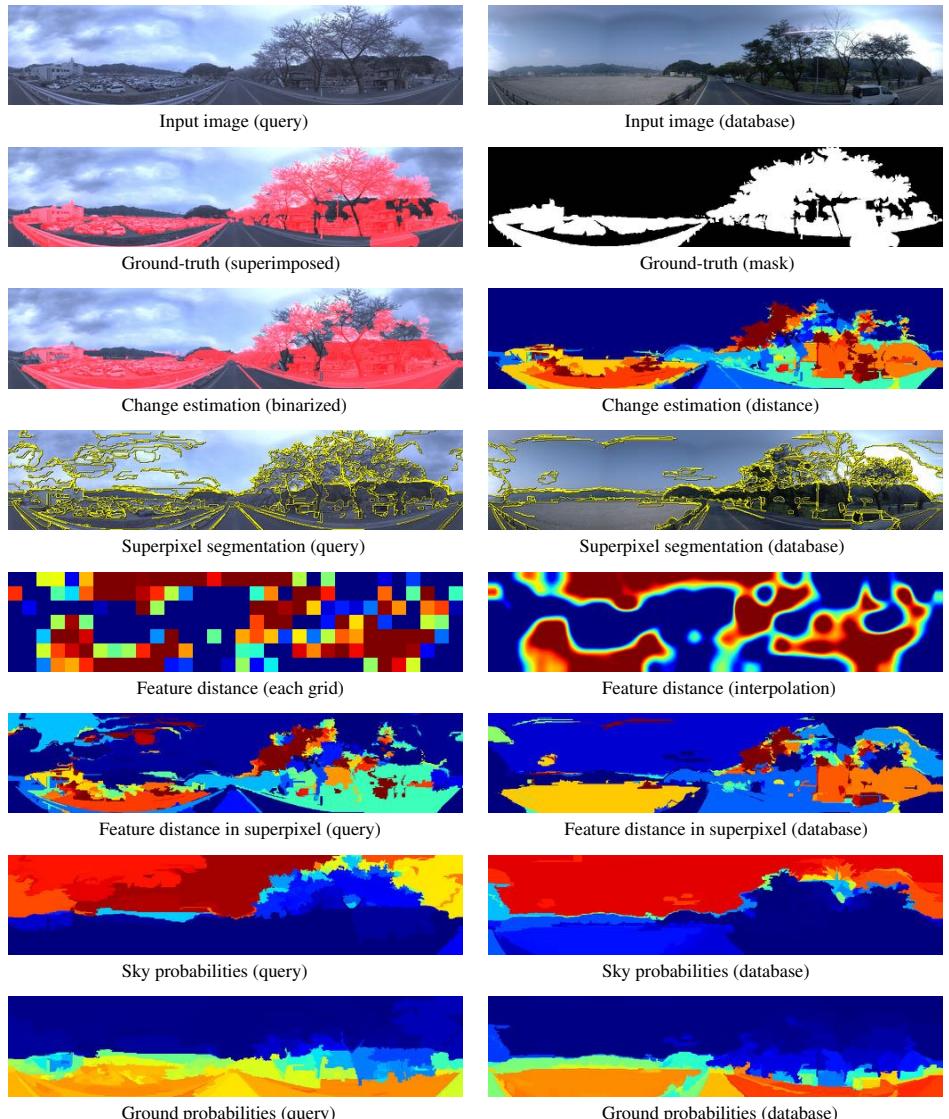


Figure 96: Results of change detection using pool-5 feature of CNN (Frame No. 96/100 in change detection dataset of tsunami)

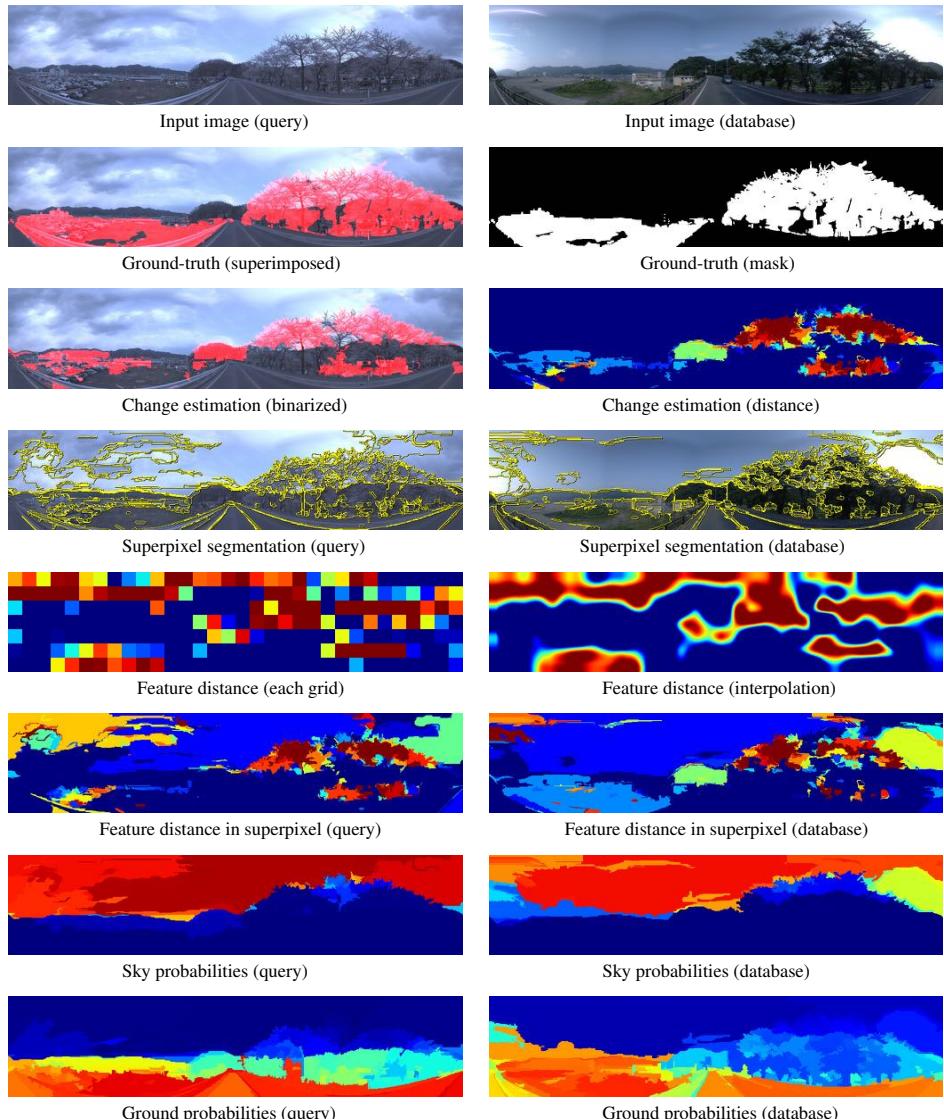


Figure 97: Results of change detection using pool-5 feature of CNN (Frame No. 97/100 in change detection dataset of tsunami)

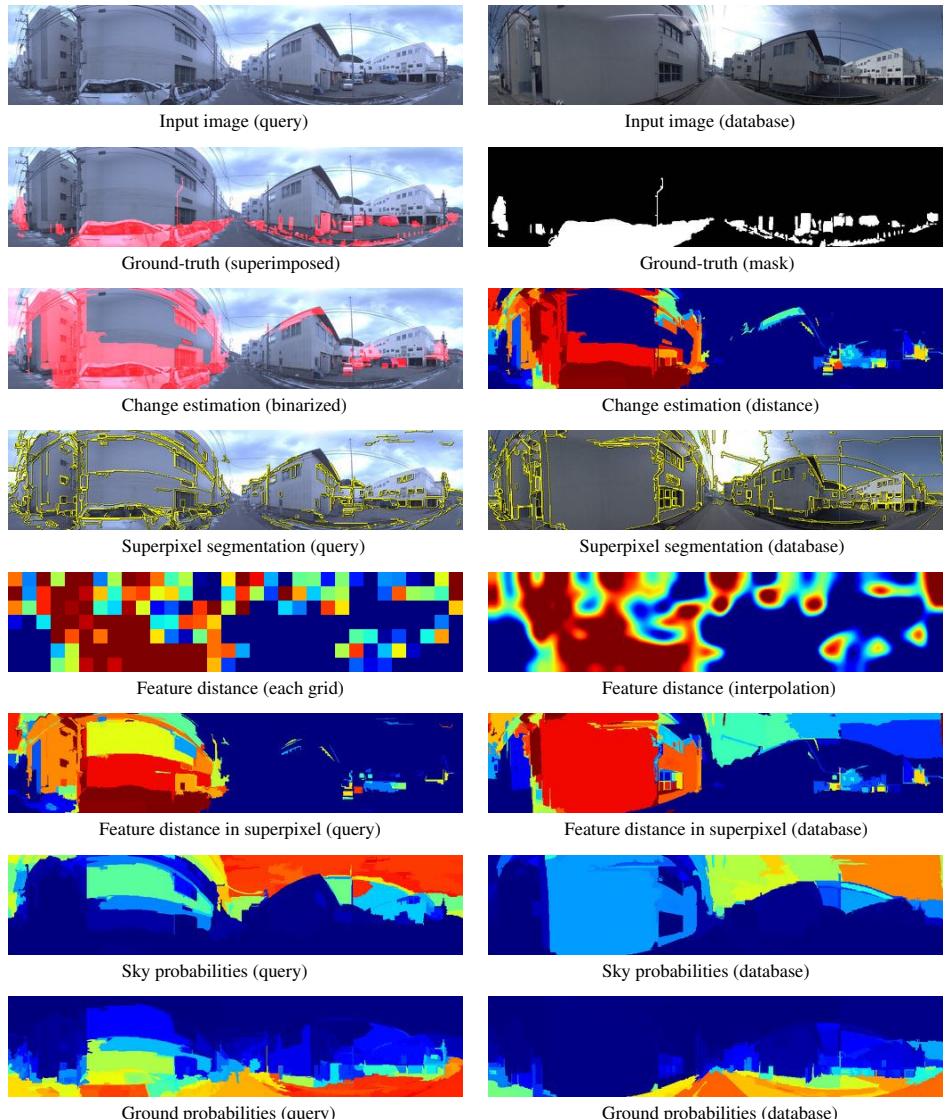


Figure 98: Results of change detection using pool-5 feature of CNN (Frame No. 98/100 in change detection dataset of tsunami)

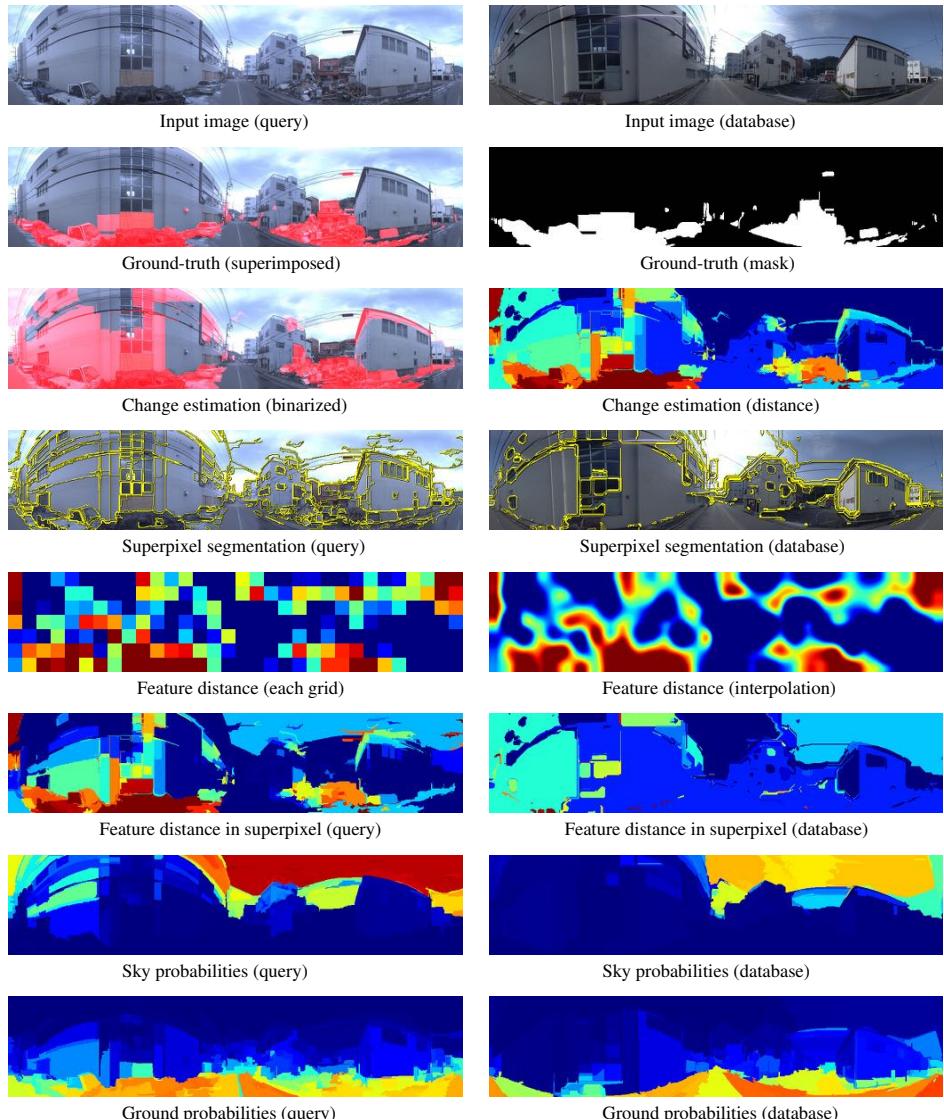


Figure 99: Results of change detection using pool-5 feature of CNN (Frame No. 99/100 in change detection dataset of tsunami)

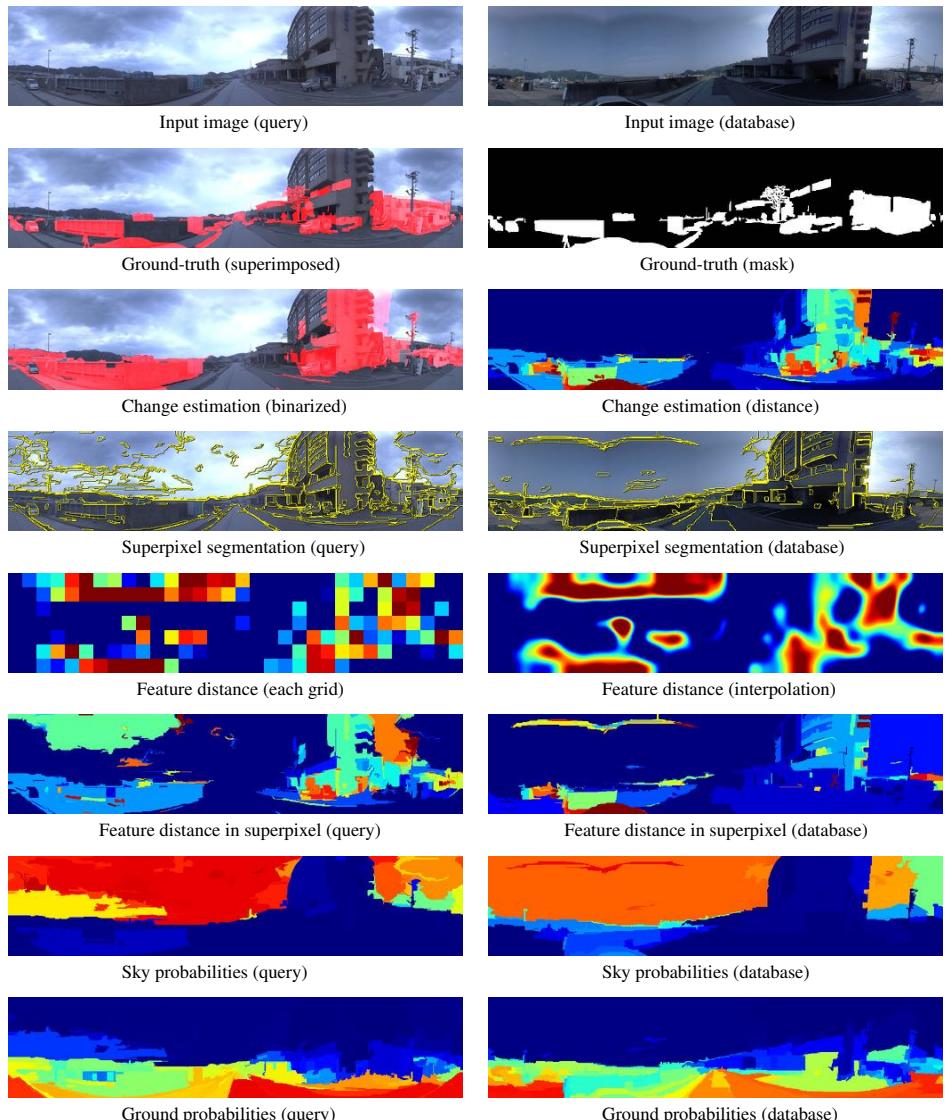


Figure 100: Results of change detection using pool-5 feature of CNN (Frame No. 100/100 in change detection dataset of tsunami)