(A) PacBio HiFi ROC Plot (B) Nanopore R10 ROC Plot 0.994 Giraffe, HPRC-filtered Giraffe, HPRC-filtered 0.994 Giraffe sampled Giraffe sampled True positive rate **Frue positive rate** Graphaligner 0.993 Winnowmap Minimap2 Minimap2 0.993 Winnowmap Giraffe, CHM13 Giraffe, CHM13 0.992 Graphaligner 0.992 Giraffe, HPRC Giraffe, HPRC 0.991 0.991 0.990 0.005 0.006 0.007 0.008 0.004 0.006 0.008 0.010 False positive rate False positive rate 750,000 **Number of reads** 250,000 500,000 (C) PacBio HiFi Incorrect reads (D) Nanopore R10 Incorrect reads 20,000 All reads MAPQ 60 reads MAPQ 60 reads 15,000 15,000 Read count 10,000 10,000 5,000 5,000 Girafte Sampled Girafte sampled Graphaligher Withowhap Cirafte Cirafte Cirafte Minigraph Giraffe Wirrownap GraphAligher Minigraph (E) PacBio HiFi Unmapped Bases (F) Nanopore R10 Unmapped Bases 4.0 5.0 Unmapped bases (%) Unmapped bases (%) 3.2 4.0 3.0 0.2 2.0 0.1 1.0 Girafte sampled GraphAligner Cirafte sampled Graph Aligner 0.0 WirtownaR WITTOWTAR Cirafte Minidaph 0.0 Willingby Cirafte Minigraph Cirafte Cirafte Wirina 22 Reference HPRC-minigraph CHM13 HPRC HPRC-filtered