

Marsh McLennan Flood Risk Index

Overview And Structure

['cVU'cj Yfj]Yk 'cZ' ccX'f]g_ Uhh Y'bQ Y'b

Selection Criteria

XcW'a Ybh' 'H\Y%\$\$!mYUf'fYH fb'dYf]cX'a Udg'Zcf`
fU]bZU`` ccX]b['k YfY'W'W'UH'X'VmdYfZcfa]b['Ub`
YI hfYa Y'j U'i Y'UbU'ng]g'cZ'h Y'Ubbi U'a Ul]a i a 'j U'i Yg`
cZXU]'mdfYV[d]h]cb'Z'ca 'a i 'h]d'Y'cVgYfj Uh]cbU'ž
fYUbU'ng]g'zUbX W]a UH'ia cXY'XUH U'gYhg"

h\Y'7]a XYI 'dfc'YVW'H\Y'Y][\hYI HfYa Y'fU]bZU''a Udg' Zcf YUW' k Ufa]b['gWbUF]c'k YfY'h Yb Uj YfU[YX'hc' dfcXi W'U'a i 'h]!a cXY'Ygh]a UhY''H\Y'a i 'h]!a cXY'' Uj YfU[Yg'k YfY'h Yb 'fYgW'YX Vmia i 'h]d' m]b['h\Ya 'Vmi h\Y'V]Ug'Vt'ffYVW]cb ZJW'cf'a Ud 'W'W' 'UH'X']b'dc]bh' "" H\Y'UfYU!k Y][\hYX'Uj YfU[Y'j U'i Y'cZYI HfYa Y'fU]bZU'']b'YUW' Vt'i bHfM'Zcf'YUW' k Ufa]b['gWbUF]c'k Ug' h\Yb W'W' 'UH'X''

Point 5. H\Y'UfYU!k Y][\hYX'Uj YfU[Y'j U'i Y'cZYI HfYa Y' fU]bZU'']b'YUW' Vt'i bHfM'Zcf'YUW' k Ufa]b[''Y'j Y' 'fUg' W'W' 'UH'X']b'dc]bhg%'UbX' ('Ek Ug'a UddYX'hc' U'fU]bZU'' \UnUfX'gVt'fY'ffU]b[]b['Zfca' '%hc' %\$Ei g]b['h\Y'XYV'Yg' cZ'h\Y'X]gHf]Vi h]cb'cZ'h\Y'&\$, \$YI HfYa Y'fU]bZU'']U'i Yg' Vt'i bHf]Yg''

Point 6. C'VgYfj Uh]cbU'z'fYU]bU'ng]g'z'UbX'a cXY'' g]a i 'Uh]cb'XUH\UX'X] YfYbh'fYgc'i h]cbg''DYfZcfa]b[' h\Y'cdYfU]h]cbg'XYgW]VYX']b'dc]bhg%'hc' ('fYeI]fYX'hc' fY]bh'f'dc'UH'XUH'hc' h\Y'\][\Ygh'fYgc'i h]cb'Ua cb['U'' XUH'g'Yhg'f]C'6GE''

H\Y'hc'U' \UnUfX'gVt'fY'Zcf'YUW' Vt'i bHfM'k Ug' Ygh]a UhY'X'VmiUj YfU[]b['h\Y'f]j Yf]bYz'Vt'UghU'z'UbX' fU]bZU'' \UnUfX'gVt'fYg''

Limitations

H\Y'&\$' \$Z&\$) \$ZUbX'&\$, \$'h]a Y'\cf]ncbg'k YfY' Uggi a YX'hc' Vt'ffYgdc'bX'hc' Z%) .7zZ&'.7z Z' ") .7'k Ufa]b[''Y'j Y'g'VUgYX'cb'7A =D) 'a i 'h]!a cXY'' ['cVU' h'Ya dYfU]h' fY'dfc'YVW]cbg'z'k]h'ci h'UW'Vt'i bh]b[' Zcf'X] YfYbh'W]a UhY'g'Ybg]h]j]h]Yg'UW'cgg'h\Y' 7A =D) YbgYa V'Y''

≠Zcfa Uh]cb'cb' ccX'XYZYbgYg'k Ug'bch]bW' XYX']b' h\Y'UbU'ng]g''

8] YfYbh'fYgc'i h]cbg'cZ'h\Y'XUH'g'Yhg'i gYX'hc' Ygh]a UhY' fU]bZU'' ccX]b[]a dUW'YX' h\Y'f'fYdfYg'Ybh]h]cb'cZ YI HfYa Yg''

7A =D) W]a UhY'a cXY'g'a Umi bXYfYgh]a UhY'cf' c] YfYgh]a UhY'fU]bZU'' YI HfYa Yg'z'UbX' Vt'ffYVW]cb' ZJW'cf'g' k YfY'Udd']YX'hc' fYX'i W'gi W'V]UgYg''6]Ug'Vt'ffYVW]cb' ZJW'cf'g'UfY'Uggi a YX' Vt'bg'U]bh]b' h]a Y''

Exposure

Background

9l d'c]g' fY'gVt'fYg'fY' YVW]bZcfa Uh]cb'cb'h\Y' Vt'a dcbYb'g.

- **Human exposure** z'Ub Ygh]a UhY'cZ'h\Y'dYfW'bhU[Y' cZ'dcdi 'Uh]cb'YI d'cgYX'hc' ccX]b[]b'YUW' Vt'i bHfM
- **Economic exposure** z'Ub Ygh]a UhY'cZ'h\Y' dYfW'bhU[Y'cZ'UggYhg'YI d'cgYX'hc' ccX]b[]b' Vt'i bHfM

9l d'c]g' fY'gVt'fYg'k YfY' W'W' 'UH'X' Vmi]bh'fYg'VW]b[' dcdi 'Uh]cb'UbX'UggYhX]gHf]Vi h]cb'XUH'k]h'U'UmYf' cVU]b]YX'VmVt'a V]b]b['h\Y'%'\$!mYUf'fYh'fb'dYf]cX' ['cVU']bi bXUh]cb'a Udg'Zcf'f]j Yf]bYz'Vt'UghU'z'UbX'fU]bZU'' ccX]b['Zcf'YUW' k Ufa]b['gWbUF]c''B'c'W'Ub[Yg]b'h]a Y' cZ'h\Y'dcdi 'Uh]cb'UbX'UggYhX]gHf]Vi h]cbg'k YfY'Uggi a YX' k \Yb Ygh]a Uh]b[YI d'c]g' fY'gVt'fYg'Zcf'Z' h' fY'W]a UhY' W'Ub[Y'gWbUF]c'g'z'h'i g'cb'm]bVt'f'dc'fU]b[]b'Zcfa Uh]cb' \UnUfX''

Calculation

Point 1. 5b'U[[fY[UhY'X'%'\$!mYUf'\UnUfX'a Ud'k Ug' W'YUH'X'VmiVt'a V]b]b['h\Y'f]j Yf]bYz'Vt'UghU'z'UbX' fU]bZU'']bi bXUh]cb'a Udg'UW'cgg'YUW' cZ'h\Y'W]a UhY' gWbUF]c]g': cf'fU]bZU''z'YI HfYa Y'dfYV]d]h]h]cb'YI W'YX]b['&\$a a #XUm'k Ug'i gYX'Ug'U'h'fYg'c'X'hc']XYbh]ZmU]h]f]g' UfYUg''H\Y'&\$' \$Z&\$) \$ZUbX'&\$, \$'h]a Y'\cf]ncbg'k YfY' Uggi a YX'hc' Vt'ffYgdc'bX'hc' Z%) .7zZ&'.7zUbX'Z' ") .7' k Ufa]b[''Y'j Y'g''

Point 2. 5ggYhj U'i Y'XUH'Z'fca ; 5F'k Ug'U[[fY[UhY'X' hc' U'fUgh'f''UmYf'f]a '1' %a E'hc'dfcj]XY'U'Vt'bh]bi ci g' fYdfYg'Ybh]h]cb'cZYI d'c]g' fY''

Point 3. H\Y'['cVU'dcdi 'Uh]cb'f] <G@'UbX'UggYh' f] 5F'E''UmYf'g'k YfY' h\Y'b'W]ddYX'hc' h\Y'Vci bXUf]Yg'cZ' h\Y'Vt'a V]b]YX'%'\$!mYUf'f]j Yf]bYz'Vt'UghU'z'UbX'fU]bZU'']bi bXUh]cb'a Udg''

Point 4. 5'ncbU`ghUhg]Vg`cdYfUhc'k Ug'Udd`jYX'hc'gi a`
h\Y'j'U'i Yg'cZdcdi `Uh]cb`UbX`UggYhg]b'h\Y`]bi bXUH\X`
UfYUgžh'i g`W`W`Uh]b[`h\Y'hcH`j'U'i Yg'cZYI dcgYX`
dcdi `Uh]cb`UbX`UggYhg]b`YUW` Vti bhfmi

Point 5. H\Y'gUa`Y'ncbU`ghUhg]Vg`cdYfUhc'k Ug`
Udd`jYX'hc`W`W`Uh\Y'h\Y'hcH`j`UggYhg]UbX`dcdi `Uh]cb`
Vti bhfmi

Point 6. H\Y'dYfWbhU[Yg'cZdYcd`Y`UbX`UggYhg`
h\YfUHbYX`Vm`ccX]b[`k`YfY`W`W`UH\X`Zcf`YUW`
Vti bhfmiVmX]j`j]b[`h\Y`bi a`VYfgYgh]a`UH\X`]b`dc]bhg`
)"

Point 7. <i a`Ub`UbX`YVt`bca`j]Wl`dcgi`fYg'gVt`fYg`Zcf`
YUW`Vti bhfmiU]b[]b[`Zfca`%`hc`%\$Ek`YfY`Ygh]a`UH\X`
Zfca`h\Y`k`c`dYfWbhU[`Y`j`U'i`Yg`VmVt`a`dUf]b[`h\Ya`
hc`h\Y`XYV`Yg'cZh\Y`Vt`ffYgdcX]b[`X]gh]Vi`h]cb`cZ`
dYfWbhU[`Yg`UW`cgg`Vti bhf]Yg]b`&\$, \$"Gv`fYg`Zcf`h\Y`
Zci`f`gW`bUf]cg`f`fYgYbhX`Unž&\$` \$ž&\$, \$Ek`YfY`U`
Ygh]a`UH\X`i`g]b[`h\Y`XYV`Yg'cZh\Y`&\$, \$X]gh]Vi`h]cbg"

Point 8. HcH`YI`dcgi`fY`gVt`fYg`k`YfY`W`W`UH\X`Vm`
Uj`YfU[]b[`h\Y`i a`Ub`UbX`YVt`bca`j]Wl`dcgi`fY`gVt`fYg"

Limitations

H\Y`&\$` \$ž&\$) \$žUbX`&\$, \$`h]a`Y`\cf]ncbg`k`YfY`
Uggi`a`YX`hc`Vt`ffYgdcX`hc`ž%)`..7žž&`..7ž`
Ž`")`..7`k`Ufa`]b[``Y`Y`g`V`U`g`Y`X`c`b`7A`=D)`a`i`h]a`cXY`
[`cVU`hYa`dYfUH`fY`d`f`c`Y`V`h]c`bgž`k`]h`ci`h`U`W`V`i`b`h]b[`Zcf`X]`YfYbhW]a`Uh`Y`g`Y`b`g`h]j`]h]Yg`UW`cgg`h\Y`
7A`=D)`YbgYa`V`Y"

8i`Y`hc`h\Y`X]`W`hmi]b`Ygh]a`Uh]b[`ccX`YI`dcgi`fYž`
h\YfY`k`Ug`U`]a`]hX`W`c]W`cZUj`U]`UV`Y`X`UH`U`Y`hg`"8UH`
gci`fW`g`W`cgYb`hc`W`W`UH`YI`dcgi`fY`fYdfYgYbhVYgh`
Vcf`X]`Uj`dY`W`Y`g`W`Zcf`Zch]`cc`Y`k]b`h`h`a`g`Y`g]`W`ZcY`W`Zg]`U`c]a`Y`

Vulnerability

Background

Ji 'bYfUV]]hmgVt'fYg'fY YVh'gcV]cYVt'bc a]W
gi gWdh[V]]h'hc' ccX]b['UbX'UFY'VUgYX'cb'h\Y'
]bX]W]h'c'fg.

- **The Human Development Index (HDI)**
Wldhi fYg'h\ fYY'X]a Ybg]cbg'cZ\i a Ub'XYj Y'cda Ybh'
h\Uh'UFY'\]]\`mfY'Yj Ub'h'c'\i a Ub j i 'bYfUV]]h'm

24 Details regarding the calculation of HDI can be found

Overlays Statistics Calculation

Background

H\Y`Cj Yf`Ung`gYVW]cb`cZh\Y`bXYI`g\ck`g`h\Y`[`cVU`
]bi`bXUh]cb`a`Udg`Zcf`f]j`Yf]bY`UbX`Vt`UghU`ccX]b[`
f%\$!mYUf`fYfi`fb`dYf]cX`a`Udg`Zfca`K`F`=g`5ei`YXi`Vh`
: `ccXg]z`UbX`h\Y`fU]bZU`]bi`bXUh]cb`a`Udg[`YbYfUHYX`
h`fci`[`\`Zfca`h\Y`dfcVW`gg`XYgVW]VYX`]b`h\Y`<`UnUfX`
7U`W`U]h]cb`gYVW]cb`cZh\]g`XcW`a`Ybh`H\Y`Cj`Yf`Ung`
gYVW]cb`U`gc`dfYgYbhg`XUH]cb`h\Y`[`cVU`X]ghf]Vi`h]cbg`
cZi`fVUb`UFYUg]fi`fU`UFYUg]z`UbX`W]h]WU`]b`ZfUghfi`Vh`fY`
UggYhg]z`UWVt`a`dUb]YX`Vm`YmVt`i`bhf`n`Yj`Y`ghU]gh]Vg.

- **Urban Areas**žk]h`h\Y`dYfW`bhU[`Y`cZi`fVUb`UFYUg`
Uhf]g`cZ`ccX]b[`"
- **Rural Areas**žk]h`h\Y`dYfW`bhU[`Y`cZfi`fU`UFYUg`Uhi`
ccX]b[`"
- **Power Plants**žk]h`h\Y`dYfW`bhU[`Y`cZdck`Yf`
[`YbYfU]cb`WdU`VmiUhf]g`cZ`ccX]b[`"
- **Ports and Airports**žk]h`h\Y`dYfW`bhU[`Yg`
cZ]bhYfbU]cbU`hfUXY`j`c`i`a`Yg`fd`cf`hg]UbX`
]bhYfbU]cbU`gYUhg`fU]fdcf`hg]Uhf]g`cZ`ccX]b[`"

Calculation

Point 1. 5b`U[`[`fY[`UHXY`%\$!mYUf`\`UnUfX`a`Ud`k`Ug`
WYUHYX`VmVt`a`V]b]b[`h\Y`f]j`Yf]bY`z`Vt`UghU`z`UbX`fU]bZU`
]bi`bXUh]cb`a`Udg`UW`cgg`YUW`cZh\Y`W]a`UH`g`W`bUf]cg`
:`cf`fU]bZU`žYi`hfYa`Y`dfYV]d]hU]cb`Yi`WYX]b[`&\$a`a`#`
XUmik`Ug`i`gYX`Ug`U`h`fYg`c`X`hc`]X`Ybh]ZmUhf]g`_`UFYUg`
H\Yg`Y`a`Udg`k`YfY`]bhYfgYVW`X`k`]h`K`cf`X`6Ub`_`
Vci`bXUf`mXUH]UbX`h\Y`XUH]gYhg`]ghYX`]b`dc]bhg`&`hc`(`
hc`Ygh]a`UH`h\Y`dYfW`bhU[`Yg`c`Z`f`V`U`#]`Ub`Vf` :` Zi`fVUV` U` U`

V` Z` \g`X`hc` Y`
\$` g`c`Z`

Acknowledgments

Authors

Gk Yb\U'Gi fa]bg_]ZA UbU[]b['8]fYVWcfz7`ja UH'FYg]YbWZA Ufg\ A W@YbbUb 5Xj UbHU[Y
7`Ui X]c`GU`c]hZFYgYUFW`A UbU[YfZA Ufg\ A W@YbbUb 5Xj UbHU[Y
GUbXfU'8i YbUgZGYb]cf'8UH'GVYb]ghZ
Hcg\]b GYei Y]fUZFYGUFW`5bU`ngHZA Ufg\ A W@YbbUb 5Xj UbHU[Y
5X]h]?c\Uf]ZFYgYUFW`5bU`ngHZA Ufg\ A W@YbbUb 5Xj UbHU[Y
Gi a Yf'8fU`ZFYgYUFW`5bU`ngHZA Ufg\ A W@YbbUb 5Xj UbHU[Y

Contributors

F]VUfX`Ga]h!6]b[\Ua ž9l YW`hj Y'8]fYVWcfzA Ufg\ A W@YbbUb 5Xj UbHU[Y
6`U]f'7\Ua YfgZA UbU[]b['8]fYVWcfz-bbcj Uh]cbg]b`bZfUghf`i W`i fYZA Ufg\ A W@YbbUb 5Xj UbHU[Y
?Uj]h\U`<Uf]\UfUbZ8]fYVWcfz<YU`h`mGcV]Y]YgZA Ufg\ A W@YbbUb 5Xj UbHU[Y
6Yb`<cgHfz8]fYVWcfzHFUbgZcfa Uh] Y`HYWbc`c[]YgZA Ufg\ A W@YbbUb 5Xj UbHU[Y
8Ub]Y`?Ub]Yk_g_]ZA UbU[]b['8]fYVWcfzDi V`]WGYVWcfzA Ufg\ A W@YbbUb 5Xj UbHU[Y
7`U]f`C`gcbZA UbU[]b['8]fYVWcfzA Ufg\ A W@YbbUb 5Xj UbHU[Y
: fUbV]g`6ci WUfXZA UbU[]b['8]fYVWcfzA Ufg\ A W@YbbUb 5Xj UbHU[Y
@ W`b`c`H]b[\Ua ž8]fYVWcfzGfUH] [W`DUfHbYfg\]dgZA Ufg\ A W@YbbUb 5Xj UbHU[Y
GnXbYm<YXVYf[ž8]fYVWcfz: `cVU`7cfdcfUH`GfUH] [nZA Ufg\ A W@YbbUb 5Xj UbHU[Y
A UH\Yk`9U[`Yž<YUX`cZ: `cVU`A cXY`Gc`i h]cbg]UbX`5Xj]gcfnz: i m7UfdYbhYf
A Uf`_K`YUH\Yf\YUXZA UbU[]b['8]fYVWcfz<YUX`cZ7UH]ghfcd\Y`5Xj]gcfnzG95?`ž: i m7UfdYbhYf
A]WUY`Ck YbZA UbU[]b['8]fYVWcfz: i m7UfdYbhYf
>gg]W`H`fYfZA UbU[]b['8]fYVWcfz7UH]ghfcd\Y`5Xj]gcfnz: i m7UfdYbhYf
žUj]W`U`W`fz`Yb]cf'8Y] Y`cda YbhGVYb]ghZ: i m7UfdYbhYf
xgYd\ : `6YW`YfZf/`8#5Xj]gcfmGYb]cf'7UH]ghfcd\Y`A cXY`YfZ: i m7UfdYbhYf
>fYa mK`U]hYžGYb]cf`J]W`DfYg]XYbhž6fc_]b[ž: i m7UfdYbhYf
5a m6UfbYgž<YUX`cZ7`ja UH`UbX`Gi`ghU]bUV`]hmGfUH] [nž
; Ycf[Y`G`6U`Xk`bž7cbgi`h]b['8]fYVWcf/`7c!`YUXYf`cZ7`ja UH`FYg]YbWZ
6Yj Yf`Ym5XUa`gž<YUX`cZJ]gi`U`bH`][YbW`UbX`75HD`Ubb]b[ž
B]Wc`Ug: Ui`ž<YUX`cZ7`ja UH`UbX`Gi`ghU]bUV`]hmF]g_ž
8Uj]X`?Y`nžGYb]cf`A UbU[Ya Ybh7cbgi`hUbtž9G: ž
; fUYa YF]XXY`ž7`ja UH`UbX`Gi`ghU]bUV`]hm7cbgi`h]b[`@YUXYfz
5 b
6Yb[* ž<U] Q

Mar\$P @ O Mar E H
D d d

H d@ d\$%% ; fU`V`YF` *] S *]b % " c h U` U

