**Supplementary Table 1:** Method of determining coral bleaching by study

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| Method | References |
| ***In situ* surveys** | Bonilla 2001; Bruno et al. 2001; Clark et al. 2009; Couch et al. 2017; Dalton et al. 2020; Darling et al. 2013; Davies et al. 1997; Eriksson et al. 2012; Floros et al. 2004; Gleason 1993; Glynn et al. 2001; Guest et al. 2012; Guest et al. 2016; Hardman et al. 2007; Hussain & Ingole 2020; Ibrahim et al. 2017; Jiménez et al. 2001; Jokiel & Brown 2004; Kavousi et al. 2014; Kayanne et al. 2002; Kenyon & Brainard 2006; Kim et al. 2019; Knipp et al. 2020; Lang et al. 1992; Lenihan et al. 2008; Li et al. 2012; Loya et al. 2001; Marshall & Baird 2000; McClanahan 2004; McClanahan et al. 2005; McClanahan et al. 2007; McField 1999; Miller et al. 2011; Monroe et al. 2018; Montano et al. 2010; Muñiz-Castillo & Arias-González 2021; Obura 2001; Obura et al. 2018; Oxenford et al. 2008; Paulay & Benayahu 1999; Pengsakun et al. 2019; Quimpo et al. 2020; Rodgers et al. 2017; Sakai et al. 2019; Sebastián et al. 2009; Shuail et al. 2016; Stimson et al. 2002; Thinesh et al. 2019; Vargas -Ángel et al. 2011; Vo et al. 2020; Williams et al. 2010 |
| **Image analysis—** small scale (e.g., quadrats) | Carilli et al. 2017; Chou et al. 2016; Jones 2008; Kennedy et al. 2017; Matsuda et al. 2020; Ng et al. 2020; Valino et al. 2021; Van Woesik et al. 2012 |
| **Image analysis—** large scale (e.g., transects or mosaics) | Gintert et al. 2018; Johnston et al. 2019; Raymundo et al. 2019; Riegl et al. 2012; Teixeira et al. 2019; Tkachenko & Soong 2017 |
| **Video analysis** | Carroll et al. 2017; Frade et al. 2018; Nolan et al. 2021; Ritson-Williams & Gates 2020 |
| **Combination** of *in situ* surveys and analysis | Hédouin et al. 2020; Hoegh-Guldberg & Salvat 1995; Morgan et al. 2017; Porter et al. 2021; Spencer et al. 2000 |

**SupplementaryTable 2:** Coral bleaching response metric by study

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| Response metric | References |
| **Proportion of total colonies** completely or partially bleached, pale, and/or otherwise affected; “bleaching prevalence” | Carilli et al. 2017; Carroll et al. 2017; Chou et al. 2016; Clark et al. 2009; Couch et al. 2017; Davies et al. 1997; Floros et al. 2004; Frade et al. 2018; Gintert et al. 2018; Hardman et al. 2007; Hédouin et al. 2020; Hoegh-Guldberg & Salvat 1995; Hussain & Ingole 2020; Jiménez et al. 2001; Johnston et al. 2019; Jones 2008; Kavousi et al. 2014; Kayanne et al. 2002; Kennedy et al. 2017; Kenyon & Brainard 2006; Lenihan et al. 2008; Lang et al. 1992; Li et al. 2012; Marshall & Baird 2000; Matsuda et al. 2020; McField 1999; Miller et al. 2011; Monroe et al. 2018; Nolan et al. 2021; Obura 2001; Obura et al. 2018; Oxenford et al. 2008; Quimpo et al. 2020; Raymundo et al. 2019; Reyes-Bonilla 2001; Rodgers et al. 2017; Riegl et al. 2012; Ritson-Williams & Gates 2020; Sakai et al. 2019; Shuail et al. 2016; Teixeira et al. 2019; Thinesh et al. 2019; Van Woesik et al. 2012; Vargas-Ángel et al. 2011; Vo et al. 2020; Williams et al. 2010 |
| **Bleaching Index (BI)** developed by McClanahan; calculated as [*0c1+1c2+2c3+3c4+4c5+5c6*]*/5* where *c1* through *c6* are bleaching categories by colony | Dalton et al. 2020; Darling et al. 2013; Guest et al. 2012; Guest et al. 2016; Ibrahim et al. 2017; Kim et al. 2019; McClanahan 2004; McClanahan et al. 2005; McClanahan et al. 2007; Morgan et al. 2017; Muñiz-Castillo & Arias-González 2021; Ng et al. 2020; Pengsakun et al. 2019; Porter et al. 2021; Sebastián et al. 2009; Valino et al. 2021 |
| **Qualitative** (based on ﬁeld observations) | Bruno et al. 2001; Eriksson et al. 2012; Jokiel & Brown 2004; Loya et al. 2001; Paulay & Benayahu 1999; Spencer et al. 2000; Stimson et al. 2002; Tkachenko & Soong 2017 |
| **Within-colony** condition assessments for % pale, bleached, dead, etc. area  | Gleason 1993; Glynn et al. 2001; Montano et al. 2010 |

**SupplementaryTable 3:** Level of taxonomic resolution by study

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| Level of resolution | References |
| **Genus-specific** | Carroll et al. 2017; Chou et al. 2016; Dalton et al. 2020; Darling et al. 2013; Davies et al. 1997; Eriksson et al. 2012; Floros et al. 2004; Frade et al. 2018; Gleason 1993; Guest et al. 2012; Guest et al. 2016; Hardman et al. 2007; Hédouin et al. 2020; Hoegh-Guldberg & Salvat 1995; Hussain & Ingole 2020; Ibrahim et al. 2017; Kavousi et al. 2014; Kayanne et al. 2002; Kennedy et al. 2017; Kim et al. 2019; Li et al. 2012; Marshall & Baird 2000; McClanahan 2004; McClanahan et al. 2005; McClanahan et al. 2007; Monroe et al. 2018; Montano et al. 2010; Morgan et al. 2017; Nolan et al. 2021; Obura et al. 2018; Porter et al. 2021; Quimpo et al. 2020; Sebastián et al. 2009; Shuail et al. 2016; Spencer et al. 2000; Teixeira et al. 2019; Thinesh et al. 2019; Tkachenko & Soong 2017; Valino et al. 2021; Van Woesik et al. 2012; Vargas-Ángel et al. 2011; Vo et al. 2020; Williams et al. 2010 |
| **Species-specific** | Bruno et al. 2001; Carilli et al. 2017; Clark et al. 2009; Couch et al. 2017; Gintert et al. 2018; Glynn et al. 2001; Jiménez et al. 2001; Johnston et al. 2019; Jokiel & Brown 2004; Jones 2008; Kenyon & Brainard 2006; Knipp et al. 2020; Lang et al. 1992; Lenihan et al. 2008; Loya et al. 2001; Matsuda et al. 2020; McField 1999; Miller et al. 2011; Muñiz-Castillo & Arias-González 2021; Ng et al. 2020; Obura 2001; Oxenford et al. 2008; Paulay & Benayahu 1999; Pengsakun et al. 2019; Raymundo et al. 2019; Reyes-Bonilla 2001; Riegl et al. 2012; Rodgers et al. 2017; Ritson-Williams & Gates 2020; Sakai et al. 2019; Stimson et al. 2002 |

**Supplementary Table 4:** Sampling time frame with regard to the bleaching event, by study

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| Time of observation | References |
| **During** the event | Carilli et al. 2017; Chou et al. 2016; Frade et al. 2018; Glynn et al. 2001; Hédouin et al. 2020; Hoegh-Guldberg & Salvat 1995; Ibrahim et al. 2017; Jokiel & Brown 2004; Kavousi et al. 2014; Kenyon & Brainard 2006; Kim et al. 2019; Lenihan et al. 2008; McClanahan et al. 2007; Muñiz-Castillo & Arias-González 2021; Nolan et al. 2021; Paulay & Benayahu 1999; Pengsakun et al. 2019; Quimpo et al. 2020; Shuail et al. 2016; Teixeira et al. 2019; Valino et al. 2021; Van Woesik et al. 2012; Vo et al. 2020; Williams et al. 2010 |
| **Shortly after** (within weeks) | Couch et al. 2017; Gleason 1993; Guest et al. 2016; Hussain & Ingole 2020; Johnston et al. 2019; Jones 2008; Kennedy et al. 2017; Li et al. 2012; Marshall & Baird 2000; McClanahan et al. 2005; Monroe et al. 2018; Obura 2001; Oxenford et al. 2008; Rodgers et al. 2017; Riegl et al. 2012; Ritson-Williams & Gates 2020; Sebastián et al. 2009; Spencer et al. 2000; Tkachenko & Soong 2017; Vargas-Ángel et al. 2011 |
| **After** (>2 months later) | Bruno et al. 2001; Carroll et al. 2017; Davies et al. 1997; Eriksson et al. 2012; Lang et al. 1992; Obura et al. 2018; Raymundo et al. 2019; Reyes-Bonilla 2001; Sakai et al. 2019 |
| **Far after** (~6 months to one year later) | Guest et al. 2012; Miller et al. 2011; Stimson et al. 2002 |
| **Continual** (before, during, and/or after) | Clark et al. 2009; Dalton et al. 2020; Darling et al. 2013; Floros et al. 2004; Gintert et al. 2018; Hardman et al. 2007; Jiménez et al. 2001; Kayanne et al. 2002; Knipp et al. 2020; Loya et al. 2001; Matsuda et al. 2020; McClanahan 2004; McField 1999; Montano et al. 2010; Morgan et al. 2017; Ng et al. 2020; Porter et al. 2021; Thinesh et al. 2019 |